REPORT OF THE 2ND MEETING OF THE SCIENTIFIC COMMITTEE OF ACCOBAMS

ISTANBUL, 20-22 NOVEMBER 2003

Permanent Secretariat of the Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area

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Introduction

1. The 2nd Meeting of the Scientific Committee (SC) of ACCOBAMS was held in Istanbul, Turkey, at the Hotel Pera Palace, from 20-22 November 2003[1].

2. The list of participants is attached as Annex 1 to the present report.

AGENDA ITEM 1: Opening of the Meeting

3. The Chair, Giuseppe Notarbartolo di Sciara, opened the meeting at 9.00 a.m. and welcomed participants. He emphasized that, compared to the first meeting, participation at the present one had been considerably expanded, with the aim of making the meeting of the Scientific Committee an opportunity for contact and exchange among the actors of the scientific and conservation community in the Agreement Area. He requested feedback from the members of the Committee to evaluate the success on this experiment (and see Item 7).

4. Mr. Mustafa Akıncıoğlu, Deputy Director in the Direction General of Nature Conservation and National Parks of the Government of Turkey, welcomed the participants to Istanbul. He stressed the importance Turkey attached to nature conservation, as was testified by the numerous multilateral environmental agreements to which Turkey had adhered or was in the process of adhering to.

5. The Executive Secretary (ES) of ACCOBAMS, Ms. Marie-Christine Van Klaveren, expressed the thanks and those of the President of ACCOBAMS to the Turkish Government for its dedication to biodiversity conservation. She emphasized the key role of Turkey due to its geographical situation between both areas relevant to ACCOBAMS, and offered the assistance of the Secretariat in facilitating the accession of Turkey to the Agreement. She hoped that Turkey will participate as a Party at the next session of the meeting of the Parties.

6. Finally, Mr. Plamen Dzhadzev, Executive Director of the Permanent Secretariat of the Black Sea Commission, in representation of the Black Sea Subregional Coordination Unit (BSSRCU), made brief introductory remarks, and referred to the importance of cooperation with ACCOBAMS for the conservation of the biodiversity in the Black Sea, in particular in the light of the Black Sea Protocol on Biodiversity and Landscape Conservation recently signed by the Black Sea Coastal States. He assured participants that the responsibilities and functions imposed on the BSC Permanent Secretariat as ACCOBAMS Subregional Coordinating Unit by the MOU between ACCOBAMS and BSC Secretariats will be paid due attention and full scale assistance will be provided to the Meeting by the staff of the BSC Permanent Secretariat.

7. The Chair informed the participants that, as the next MoP was scheduled to be held in Autumn next year, it might be necessary to plan to convene the next meeting of the SC in 2005, a few months after the MoP, in order to allow for the necessary paperwork and implementation activities to be addressed. This is considered further under Agenda Item 7.

[1] On the morning of 20 November, at the end of its opening session, the meeting was disrupted by an explosion that occurred in the nearby British Consulate due to a terrorist attack, which caused some window panes in the meeting room to shatter. The Committee agreed to continue the meeting after the representative of the Turkish Government, Mr. Mustafa Akıncıoğlu, had provided assurances from his government that adequate security measures had been implemented for the meeting, and had strongly requested that the meeting should continue. The meeting stood in silence in remembrance of those who had died or been injured in the two bomb attacks in Istanbul that day.

AGENDA ITEM 2: Adoption of the Rules of Procedure

8. The ES drew the attention of the members of the Scientific Committee to two proposed amendments of the Rules of Procedure, concerning Rules 4 (representation and participation; members) and 11 (meetings).

9. The meeting adopted the Rules of Procedure of the SC contained in the document CS2/Doc3. These are attached as Annex 2.

AGENDA ITEM 3: Adoption of the Agenda

10. The Chair introduced the provisional agenda of the meeting, contained in document CS2/Doc2. The Committee agreed to merge Item 4.2.3 (stranding networks) with Item 4.1.18 (stranding protocol and database), to change the order of Item 5 (Recommendations to MoP2) and item 6 (any other business) and to add four sub-items to Any Other Business. These changes are given in the adopted agenda (Annex 3).

11. With reference to the provisional timetable, the Chair suggested the participants examine item 4.2.1 (anthropogenic noise) and item 4.2.2 (ship collisions) on Thursday afternoon in order to allow the participation in the work on these items by experts expected to leave the next day.

AGENDA ITEM 4: Implementation of the ACCOBAMS work plan

12. In introducing this agenda item, the Chair noted that, thanks to the voluntary work of the members of the SC and of a number of other supporting experts and organizations, excellent progress had been made in the implementation of the ACCOBAMS work plan. Much progress however remains to be made. The Chair appealed to the members of the Committee to strengthen their contribution to the work of the Committee itself and to the general work of ACCOBAMS. In particular, he invited the members to share within the SC their relevant research and conservation activities, and to provide support in fund raising for the implementation of ACCOBAMS initiatives.

13. The Committee agreed to a change in the practice for the establishment of working groups (WGs). When a working group is considered necessary, a chair or coordinator for the group should be identified who would then be responsible for identifying other suitable members of the group. Existing WGs will be revised following the new procedure. The Committee also stressed the importance of the final outputs of the WGs being submitted to the Committee for final review and approval.

4.1: Update on intersessional activities

4.1.1: ACCOBAMS Science Website

14. Giovanni Bearzi, Tethys Research Institute, Italy, presented a progress report on the establishment of the ACCOBAMS Science Website. A summary is attached as Annex 4. The website includes a database system aimed at storing information on cetacean research and conservation activities. It is accessible by registering as a user of the web site. This section however, is, at the moment, password-protected. The SC agreed to allow access to the database also to non-members, and recommended that this option be publicised and that relevant people be invited to register and input

relevant data to the database (which will remain moderated). The Committee thanked Bearzi for his excellent work.
15. In connection with this item, the publication of a new directory of cetacean specialists in the Agreement area was discussed. A previous edition of the directory had been published by RAC/SPA in collaboration with the Tethys Research Institute. It was thought that the compilation of the new directory could not rely on a volunteer co-ordinator. The meeting requested the Secretariat to consider hiring a consultant to produce the directory and to take, at the same time, the opportunity to promote the use of the Web-based database (estimated work of 1 month per year). The meeting also recommended collaboration with the SRCUs in this task, in particular with the RAC/SPA given its previous experience. The representative of ICRAM mentioned that within a LIFE project on the bottlenose dolphin, one of the activities provided for the establishment and management of a database of experts, and offered collaboration in the preparation of the directory. The Committee welcomed this information.

4.1.2: Operational procedures

16. SC1 had identified the need to establish procedures for the submission of proposals to be considered by the Scientific Committee. To this purpose, a working group had been established with the task of drafting a set of operational procedures to be used in the future. The group had worked by correspondence and succeeded in producing Procedures for the evaluation of research and management proposals (Annex 5). The Committee adopted these and stressed that under normal circumstances, decisions should be taken during the meetings of the Committee rather than in the intersessional period.

4.1.3: Whale watching guidelines

17. Mark Simmonds, coordinator of the Whale Watching WG, introduced this agenda item. The group had worked intensively and had produced draft guidelines that were adopted before the SC2 (Annex 6). He explained that a regulation on whale watching was a complex issue, and that operational procedures had to be tailored to each specific case. The guidelines had, in his view, to be seen as a detailed framework within which tailored tools could be developed. He also considered the guidelines to be an evolving document, to be further improved as appropriate on the basis of newly available information and experience.

18. The Chair thanked the members of the working group for the excellent work done, and explained that the issuing of the guidelines had been speeded up in order to make them available for the Meeting of the Contracting Parties to the Barcelona Convention, held in Catania, Italy, 11-14 November 2003. The Secretariat of that Convention had also been instructed to produce such guidelines and it had therefore been considered appropriate to coordinate the two processes and produce a single document, rather then having two distinct documents applicable to the same area adopted in two different frameworks.

19. The representative of the MedSRCU informed the SC that it was recommended to the contracting Parties to the Barcelona Convention to implement the ACCOBAMS guidelines.

20. While the present guidelines were considered satisfactory and suitable to use, it was considered helpful to maintain an operational working group, tasked with further elaborating and updating the guidelines. Mark Simmonds agreed to continue to serve as chair of the Working Group, and invited all those willing to join the group to express their interest.

21. The representative of the MedSRCU informed the meeting that the RAC/SPA had produced a document compiling existing guidelines, code of conducts, regulations etc. for whale watching. He suggested that this document should constitute an annex to the guidelines. The ES stressed the necessity of a coherent, common final document and asked for a review by the ACCOBAMS working

group. It was noted that an international workshop entitled ‘Science for Sustainable Whale watching’ will be held in Cape Town in March 2004.

4.1.4: Competitive interaction

22. Drasko Holcer, coordinator of the Working Group on Competitive Interaction, drew the attention of the meeting to document SC2/doc.8 (Annex 7) which included a questionnaire developed to gather data on the dolphin-fisheries competitive interactions throughout the ACCOBAMS area. He explained that the questionnaire had been conceived for use by trained personnel. Further steps in the work of the group include the development of a plan for the collection of the data, and the identification of resources to implement it.

23. The Committee thanked the group for the work done. Collection of data is a difficult, time-consuming task that cannot be expected to be undertaken on a voluntary basis. Adequate resources need therefore to be identified. Considering that bottlenose dolphins appeared to be responsible for most interactions, the Chair suggested combining this activity with the initiative to develop a conservation plan for that species. As the bottlenose dolphin is listed in Appendix II of the EU Habitat Directive, the possibility cannot be dismissed for substantive funding of such a project from the European Commission.

24. The MedSCRU reminded the participants that one of the activities being undertaken by RAC/SPA in the next two years, in collaboration with other organisations, will be to assess the level and effects of bycatch on the cetacean populations. He suggested that a common project could be developed with ACCOBAMS regarding interaction with fisheries.

25. In the subsequent discussion, it was pointed out that obtaining funding from the EC was, in general, a long process, requiring a number of steps to be accomplished. As a first step towards this process, it was decided to prepare a short concept paper (approximately 2 pages) to be submitted to the competent Direction General of the EC, and possibly also to other institutional donors such as FFEM and GEF.

26. It was mentioned that as many as three LIFE projects having Mediterranean bottlenose dolphins as the main subject are ongoing (Summary in Annex 8). It was thus proposed to keep in mind such activities when preparing a comprehensive project, so that the envisaged actions may be seen as complementary to what is currently being done.

27. In connection with this agenda item, the Chair informed the meeting that the Secretariat is frequently requested for advice on the use of acoustic devices to address the problem of cetacean – fisheries interactions. Guidance was sought from the SC on the most appropriate reply to be given. In the subsequent discussion, it was pointed out that the issue was complex, and that no single answer could be given. Situations needed to be evaluated on a case-by-case basis. Some guidelines were, on the other hand, considered opportune, especially for the policy makers. The matter was considered urgent.

28. It was thus decided to convene a meeting, as soon as possible, of a small group (5 persons or less), with the task of revising and updating relevant guidelines that had been produced in a previous workshop convened by ICRAM in 2001. The document produced by the group would then be circulated to the SC members for possible further elaboration and approval. A recommendation to this effect, Recommendation n. 2.1 on guidelines for the use of acoustic deterrent devoice, was adopted (Annex 34 a).

4.1.5: Cetacean by-catch

29. During SC1, the members recommended (Recommendation 1.2) that a study should be commissioned to review current knowledge regarding the extent and magnitude of cetacean by-catch

in the Agreement area; that all Parties and range states should provide estimates of cetacean by-catches to the Secretariat on an annual basis; that ACCOBAMS should participate in the efforts undertaken by the European Commission on by-catch; and that funds should be raised for the establishment of a database on by-catch. Between sessions, a draft concept proposal was prepared and sent to the relevant DG of the European Commission (EC) by the Secretariat. It seemed that the addressees were interested, however no official reply had been received.

30. The Chair recommended continuing to follow up the proposal with the EC, with the assistance of the Secretariat, but without stopping other efforts to identify resources to cover this activity.

31. Of relevance to the issue of by-catch, it was pointed out that driftnets were coming back in use in several areas of the Mediterranean Sea, even in MPAs for cetaceans, though under different names, and with some technical peculiarities aimed at differentiating them from traditional driftnets. Detailed information on the use of such gear by French and Italian fishing fleets was presented by two observers. The use of drift nets by some North African nations was also mentioned. The situation was of great concern as driftnets are considered to be the single gear inducing the highest number of incidental captures of cetaceans, and the intensive use of driftnets in the Mediterranean in past decades had contributed to a firm position by the U.N. and at the origin of a ban declared by the EU.

32. The SC recommended that the ES approach the EC and the GFCM.

33. Recommendation n. 2.2 on pelagic gillnets was adopted and is presented in Annex 34 b.

4.1.6: Pilot conservation and management actions

34. The Chair introduced this agenda item, which he suggested be referred to in the future with a more usual and understandable title: “Protected areas for cetaceans”, drawing the attention of the participants to document CS2/Doc 9 (Annex 9), which addressed the issue of the establishment of MPAs for cetaceans in the Agreement area. The paper was in particular making reference to the Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean and the Specially Protected Areas of Mediterranean Importance (SPAMIs).

35. The Chair remarked about the usefulness of having networks of protected areas, as emphasized, most notably, by the World Summit on Sustainable Development (Johannesburg, 2002), and gave the following suggestions on the way to proceed on this issue.

(a) To undertake a revision of the annotated format or SPAMIs, to account for the special needs required in the establishment of MPAs for cetaceans. The revision could be entrusted to an expert, working in consultation with RAC/SPA. The draft so produced would be circulated to the SC for approval.

(b) To test the revised annotated format by compiling proposals for the areas identified by MoP1. Priority should be given to areas under the jurisdiction of a country Party to ACCOBAMS, notably the pre-identified sites in Croatia and in Ukraine. Concerning the remaining two sites, both in Greece, a demarche should be undertaken by the ES with the Greek Government to verify its willingness to cooperate in such action.

(c) To identify additional areas for the designation of MPAs for cetaceans in the Agreement Area.

(d) To establish a working relationship with the body in charge of the Pelagos Sanctuary in the Ligurian Sea.

36. The meeting endorsed the proposals of the Chair and recommended that the Secretariat shall examine with Greek authorities the opportunity to prepare a SPAMI proposal concerning areas

containing common dolphin critical habitat near Kalamos, western Greece, and sperm whale critical habitat south of Crete.

37. The regional representatives have been asked for the preparation for a list of marine protected areas in collaboration with both Sub-Regional Coordinating Units with the view to extending the remit of these protected areas for cetacean protection.

38. The meeting was informed that the Black Sea Commission is developing a format for reporting, *inter alia,* on marine protected areas. The advisory group of the Commission will examine the annotated and modified SPAMI format and see to which extent it can be used in the Black Sea.

39. During the discussion concerning the link between ACCOBAMS and the Pelagos Sanctuary, some observers informed the meeting about a LIFE programme that had been funded by the EC on matters related to the functioning of the Pelagos Sanctuary, and expressed the full availability of the project management to optimise efforts with ACCOBAMS. The Committee approved such line of action. Recommendation 2.3, for the establishment of a link with the Pelagos Sanctuary, was adopted (Annex 34c).

4.1.7: Workshop on habitat degradation

40. The meeting considered the available information, including a draft agenda, concerning an IWC habitat degradation workshop (SC2/ Doc.10; Annex 10), having the Mediterranean and Black Sea as a focus. The Chair reminded the meeting that such workshop had also been identified as an implementation priority in 2002 and adopted as such by MoP1. Mark Simmonds reported that sufficient funding for the workshop appeared to have been secured, that the University of Siena has offered to provide a venue for the meeting and that the workshop should hopefully take place before June 2004. The main preparations have already been done, so finalizing the preparations should not take longer than four or five months.

41. The Committee took notice of the above with satisfaction, congratulated the IWC, Mark Simmonds and his co-workers for the hard work and successful results, and offered its support for the Workshop.

4.1.8: Conservation plan for cetaceans in the Black Sea

42. Alexei Birkun introduced the documents CS2/Inf 12 (Annex 11), CS2/Doc 11 (Annex 12) and CS2/Inf 15 (Annex 13) concerning the conservation of cetaceans in the Black Sea.

43. Birkun presented the strategy for cetacean research and conservation actions developed following a request by ACCOBAMS. He said that the preparation for the conservation plan had a very high priority. The concept paper for a medium-sized GEF project has been modified according to the advice received from UNEP offices in Nairobi.

44. In parallel, Giovanni Bearzi presented a strategy document prepared in collaboration with scientists from Ukraine, Russia and Georgia for the conservation of Black Sea cetaceans (Annex 14) including activities on management, education and awareness, and research and monitoring. The strategy was prepared during the ACCOBAMS training course on photo-identification techniques for Black Sea researchers. Bearzi recommended that a common mechanism be promoted by ACCOBAMS and adopted by all Black Sea countries to facilitate cross-country collaboration while taking into account regional differences.

45. The SC encouraged the working group to continue drawing up a proposal that would enable the search for funding and to recommend to the Parties to support that project with human and financial resources.

46. The Turkish NGO Tudav expressed the intention of joining in the effort described above, and this was very much welcomed by the authors of the document and by the Committee. A proposal by Tudav in this respect is included as Annex 15.

47. Recommendation 2.4, to the Black Sea countries, was thus adopted, to support as a matter of high urgency the GEF project with human and financial resources (Annex 34d). The Committee also requested the Secretariat to find support from an expert to provide further guidance in this project.

4.1.9: Conservation plan for common dolphins in the Mediterranean Sea

48. Having recommended to the Secretariat to give highest priority to this action, the SC now discussed the progress that had been made on this issue. The project began in May 2003 and will end in April 2005. Giovanni Bearzi reported on the outputs of the project (Annex 16). Most of the threats of the relevant population have been identified and the IUCN has listed in the most recent Red List the Mediterranean population as ENDANGERED based on a proposal of the Species Survival Commission's Cetacean Specialist Group. A dedicated space was also prepared on the ACCOBAMS Science website. The work on the Conservation Plan has started. The project has been funded by ACCOBAMS, by the Whale and Dolphin Conservation Society and by ASMS Marine Mammal Protection.

4.1.10: Conservation plan for bottlenose dolphins in the Mediterranean Sea

49. Giovanni Bearzi presented the document SC2/Doc 12 that is attached as Annex 17. Discussion followed concerning the content of the plan. Several participants remarked on the fact that some parameters should be included to improve this action plan. Also it was suggested that included management measures should be reinforced.

50. The Chair drew the attention of the attendants to the fact that this is a prioritised species for the EU for funding, given that it is one of two species listed in Annex II of the "Habitats Directive". Donors' interest for one species can result in benefits to other species, if problems such as interactions with fisheries are addressed. Hervé Lethier could orient the SC on this viewpoint. LIFE funding and other sources for the rest of the Agreement area could provide support for this activity. Hervé Lethier emphasised that the action plan is a good tool to approach donors.

51. The Chair suggested defining activities on a broad and a narrow scale at the same time and proposed to set up a small working group to set up a draft of the document of about two pages to be used to raise the interest in appropriate circles. Such document could be endorsed by the SC at a later date. The Committee approved this course of action.

4.1.11: Basin-wide sperm whale survey

52. The Chair informed the group that IFAW, the International Fund for Animal Welfare, had carried out a pilot study cruise in the central Mediterranean Ionian Sea and surrounding areas in Summer 2003.

53. IFAW gave a presentation on this cruise (Annex 18) depicting the areas tracked, the results on their encounters with sperm whales as well as with several other species, including several rare species. This preliminary survey on sperm whales has provided the basis to know needs for future more in-depth studies.

54. The Committee congratulated IFAW for a job well-done, and particularly for the involvement of participants from other countries who needing to gain expertise. The matter of the preparation of a future survey based on what was learned from the preliminary study was also raised, and the creation of an *ad hoc* group to prepare a proposal with an appropriate budget towards that activity was decided. Given the interesting scientific and methodological issues arising out of this project, for which there was insufficient time to address at the present meeting, Donovan suggested that a small group of

specialists meet in the new year for that purpose. IFAW agreed to remain in touch with the SC on this issue and planned for a meeting early in 2004.

55. Simone Panigada informed the group about the study initiated by the US-based Whale Conservation Institute, through the Ocean Alliance programme (Annex 19) concerning a worldwide survey on sperm, Cuvier's beaked, and fin whales. Their activities include capacity building in the areas that they visit. The Mediterranean passage will take place between April and September 2004, and Panigada will serve as chief scientist. The advice of the ACCOBAMS' SC for the planning of the optimum route will be acknowledged by them. The Committee recommended to the ES that an M.o.U. be signed between Ocean Alliance and the ACCOBAMS Secretariat in the nearest future.

56. The Chair indicated the importance of the capacity building component for the Mediterranean countries. It was suggested that one person from each riparian country should be able to participate and be trained.

57. The matter of permits related to sampling was also raised and the need to obtain such authorizations with ACCOBAMS collaboration was stated.

58. Invited expert Mike Carron (Saclantcen, La Spezia) indicated his organisation's capacity and availability to provide a considerable amount of high-quality data gathered through its efforts in the Ligurian Sea. The Committee acknowledged.

4.1.12: Fin whale conservation activities

59. The Chair presented a document on this matter (Annex 20). He added that studies of fin whales in the Mediterranean, in addition to serving in general conservation purposes for the species in the area, could provide excellent insight into the problem of collisions between vessels and large cetaceans.

60. Simone Panigada suggested that a workshop be organised to promote progress on the study of this species, and volunteered to assist in its organisation, possibly in conjunction with Christophe Guinet.

61. The Committee recognised that the primary aim of the workshop should be to gather all experts involved in fin whale research in the ACCOBAMS area, to develop a co-ordinated research plan to address the actions identified in CS2/Doc 14, in order to avoid duplication of effort and the development of agreed methods of data collection and analysis. An important component of the Workshop will be to develop a framework for the sharing of existing and future datasets amongst scientists in the region that is required for the conservation of the species. The Committee recommended as well the establishment of a joint steering group to develop a detailed agenda and practical arrangements for the workshop. Membership of the steering group should be determined by the Chair of the ACCOBAMS Scientific Committee and a representative of the PELAGOS Sanctuary. A recommendation to this effect, Recommendation n. 2.5 on a fin whale workshop, was adopted (Annex 34e).

62. The Secretariat proposed to contact the three countries involved in the Pelagos Sanctuary to look in the possibility of collaborating in the organisation of the workshop.

4.1.13: Photo-identification training activities - Training for Black Sea Countries

63. Giovanni Bearzi informed the attendants about the training course that was organized at the Tethys Research Institute field station in Kalamos, Greece. The course was attended by Black Sea researchers including two participants from Ukraine, two from Russia and two from Georgia. Intensive training activities centred around dolphin photo-identification methods were conducted both at seas and at the base. A follow-up was organized in Balaclava, Ukraine to examine the work done by

Black Sea researchers in the Kerch Strait. Overall, this experience was very successful and brought a number of positive results. During the course, a proposal for a Conservation Plan for Black Sea cetaceans was prepared (see 4.1.8).

64. The Secretariat mentioned that a program with Georgia related to this issue is being organised for 2004. The Chair mentioned that other countries having pre-existing operational, logistic and institutional set-up could be suitable for similar training activities; for example, Tunisia, Morocco, etc. The Committee welcomed these news and looked forward to receiving information on future developments in this direction.

65. Simone Panigada informed the Committee about the development of the Europhlukes Programme. The SC1 of ACCOBAMS held in 2002 (see Annex 21, SC1 report, pag. 81) envisaged the establishment of a link between Europhlukes and Black Sea Countries, to support the involvement of Black Sea researchers and the provision of their data to Europhlukes, thus gaining access to the deliverables Europhlukes will develop before the end of 2004 (the end of funding provided by the EC). The Consortium of Europhlukes has agreed that A. Birkun and his research team be accepted as a Standard Contributor to Europhlukes.

4.1.14: Capacity building strategy

66. The main goal of this strategy is to improve the enforcement of the Agreement by developing its capacity to fulfil its mandate.

67. A capacity building working group was convened on the 18 November, 2003 in Istanbul. This WG identified the main aspects that must be taken into consideration and gave its own vision of the objectives to be pursued. It agreed that this effort must pursue three main objectives:

(a) to strengthen the institutional capacity of the Agreement and of its organs (Parties, Bureau, Secretariat, Scientific Committee) to enforce the missions of ACCOBAMS;

(b) to develop its technical capacity to work on the priorities adopted by the Parties in the different fields concerned (knowledge, management, training, public awareness, relationships)

(c) to get more financial resources from the Parties, on a compulsory and on voluntary basis, but also from some external sources (public and private sectors).

68. With this in mind, the Committee considered that the scientific issues are only part of the scope of the strategy and encouraged the Secretariat to adopt a broad approach. This approach should consider technical, financial as well as administrative aspects of the capacity of the Agreement. The activities developed in the Strategy must be suitable, manageable, achievable, realistic and targetable; the goals of the strategy must be feasible to ensure that the means will become available.

69. The Secretariat has contracted an expert to perform this study. This expert will write a draft strategy, by the next meeting of the parties, in close cooperation with the Secretariat who will provide him with all the documentation required. The Committee will also be involved in the preparation of the strategy, for all matters that pertain to its field of expertise.

70. Some participants indicated that in spite of their countries being able to carry out a good-level research, such capacity has not yet benefited the study of cetaceans. Capacity building is also necessary to orient stakeholders on the interest to provide funds for cetacean research. Another participant remarked that capacity building needs government and stakeholders involvement to be effective.

71. Other matters related to capacity building were discussed. In particular, the Chair reminded the meeting that the cooperation of all who are already engaging in capacity building in the ACCOBAMS area with independent programmes would be quite welcome within an enlarged framework of an Agreement capacity building strategy. Consequently, a number of Committee members, invited experts and observers offered collaboration with ACCOBAMS in capacity building programmes of such sort, including, among others, the seminars in Valencia, Spain, the activities of the newly-formed marine education centre in Lošjni, Croatia, the network of collaborators of the coastal Biosphere and Nature Reserves in Ukraine, the courses offered at the University of Genoa, Italy, and the programmes organised by the University of Montpellier, France. It was suggested that the Secretariat pursue how such programmes may be utilised by ACCOBAMS.

72. The western regional representative, A. Bayed, underlined the promotion and the development for research on cetaceans into the North-African riparian countries to involve fisheries institutes and universities to: (i) develop bilateral or multilateral research projects with other Mediterranean countries, (ii) promote post-graduate programs conducted to develop the research in North African waters in collaboration with Mediterranean universities with expertise in this subject, (iii) facilitate the participation of North African researchers in the capacity building supported by ACCOBAMS.

4.1.15: Educational tool kit

73. The Chair indicated that an expert review of the kit is in progress, and that it is almost complete. The translation from French to English is also in progress.

74. Daniel Cebrian recommended that these and other awareness materials should also be made available in Arabic, particularly since very little effort would be required for very practical results to be achieved. The Secretariat acknowledged the proposal and indicated that it would try to raise the needed resources for it. It was also requested that RAC/SPA should support the translation of this educational kit material.

4.1.16: Tissue banks

75. The Chair introduced the progress report on the establishment of a system of tissue banks (Annex 22).

76. Daniel Cebrian informed the participants about the symposium scheduled for next January on cetacean conservation in Libya, a country willing to become active in cetacean issues. An important part of the symposium will be a workshop on tissue banks. The workshop will have awareness and training components, and it will address matters such as necropsy implementation, tissue sample collecting, etc. The training will primarily address people from the southern and eastern Mediterranean coasts. The Committee envisages the participation in this meeting of the countries developing bilateral cooperation with Libya. A discussion about possible participants followed and Daniel Cebrian indicated that an important strategy to follow should be to train participants from countries where there is a shortage of capacity.

77. Invited expert Prof. Bruno Cozzi from the University of Padua informed that both the Universities of Padua and Barcelona are participating in the creation of tissue banks within the Agreement area. He then presented a very complete CD-ROM containing informative material and illustrations in photo and video, among other things, on necropsy, diagnosis, intervention and tissue sampling techniques on dead cetaceans. The ES expressed her desire to be able to use the CD ROM at the upcoming symposium in Libya, and to promote the CD in other ways such as by adding it to the educational kit. Bruno Cozzi also informed the group about the difficulties of transporting tissue samples among countries. The Chair mentioned that ACCOBAMS could help facilitate this transport issue.

4.1.17: Emergency Task Force

78. The Chair remarked that the establishment of an Emergency Task Force (ETF), intended to be ready 3 months after the SC1 meeting, has not yet been completed. SC2/Doc 16 was presented in order to stimulate progress, under the following headings:

- List possible events for task force intervention
- Obtain support of governmental experts on management of catastrophic events
- Establish a task force and other details (Annex 23).

Mark Simmonds agreed to coordinate the working group to carry out what is needed for the implementation of the task.

79. Oxana Tarasova, BSSCRU, underlined that the existing contingency plans for oil spills should interface with the plans of the ETF. The Committee endorsed the suggestion, remarking that efforts should be made to involve in ETF work all structures involved in marine emergency events.

4.1.18: Strandings protocol and database

80. Toni Raga presented the Stranding database prepared by the University of Valencia. (Annex 24) He explained that the database was originally intended for the Barcelona Convention area, but has now been adapted to host the entire ACCOBAMS Agreement area. Data retrieval has started and national focal points and coordinators should provide their countries data for 2000, 2001 and 2002 at this time. The Committee remarked that the database was well structured and organized.

81. The Secretariat will officially contact the Spanish authorities concerning the effective enlarging of the database throughout the entire Agreement area in conjunction with MoP Resolution 1.10.

82. The Chair indicated that there is a need to also develop the institutional, operational and logistic procedures for the implementation of an Agreement-wide stranding network, which would function as an umbrella to the assemblage of national stranding networks within both Member States and Riparian States, and proceeded to illustrate SC2/Doc 20 (Annex 25). A basic point to this question lies in the identification of expertise for the preparation of such a complex project and its transmission to the M.o.P. The Committee adopted a recommendation (Annex 34f) to the M.o.P. to invite all Member and Range States to promote the implementation of national stranding networks.

83. The Chair indicated the importance of having methods addressing live strandings. Anastasia Komnenou proposed that such a delicate and complex topic be the subject of an *ad hoc* meeting, which she would be ready to organise in cooperation with Mark Simmonds. She also informed the participants of the good possibility that such a workshop may be organised in Thessalonica, Greece, during Spring 2004, and expressed the hope that at least part of the necessary funds be secured locally.

4.1.19: Cooperation with international organizations

84. The Secretariat briefly informed the Committee about its collaboration with a number of IGOs and NGOs that had been developed or strengthened since the last SC meeting. These included, in particular: the International Whaling Commission, the European Cetacean Society, UNEP's Mediterranean Action Plan, ASCOBANS, WDCS, ASMS, SEC, and IFAW.

4.1.20: Joint Working Programme CBD/CMS, and GROMS

85. The Chair brought to the attention of the meeting a document (SC2/Inf 9) which had been prepared earlier this year and adopted by the SC on a fast-track email correspondence procedure,

where a number of items were listed, which could be the subject of cooperation between ACCOBAMS and the CBD/CMS Joint Working Programme (Annex 26). The Chair also informed that the document had been sent to the CMS as a matter of highest urgency upon request by the ES, however no feedback had been received to this date.

86. The Committee requested the ES to develop a direct contact with the CBD.

4.1.21: Precautionary principle guidelines

87. A review document prepared by Mark Simmonds and Will Burns, SC2/Doc 17 (Annex 27), was available. The Committee thanked the authors for their work. The Committee noted the difficulties experienced by other agreements and international bodies in interpreting the precautionary principle in a quantitative pragmatic manner. It also recognised the importance of determining operational guidelines if the ACCOBAMS Agreement is to be successfully implemented. It was further suggested that examples of a similar efforts to develop guidelines might be drawn from other organisations, e.g., CBD.

88. The Committee therefore agreed that a small working group be convened, (possibly by Simmonds and Burns) that includes outside experts from other organisations, to elaborate the matter further and to try to develop draft practical guidelines on how to apply the Precautionary Principle to ACCOBAMS. This should be reviewed by the Committee with a view to be developing a recommendation that can be submitted to MoP2. The ES is requested to assist in this effort.

4.2: Actions to be developed

4.2.1: Anthropogenic noise

89. During its first meeting in Monaco in March 2003, the Bureau of ACCOBAMS, noting the conclusions of a workshop held during the last ECS meeting (Las Palmas, 2003), and recalling Article II (1, 2) of the Agreement concerning the prohibition of any kind of cetacean harassment unless a special derogation is granted for scientific research, urged the Scientific Committee to prepare a recommendation directed to government agencies, the scientific community, the industry, and the military, on the use of active sonar and other man-made, high level underwater impulsive sound.

90. A ‘brainstorming’ meeting on the effects of anthropogenic noise on cetaceans in the Agreement area was therefore held on 19 November, the day before the 2003 Committee meeting, to allow for an extensive, preparatory discussion of the subject. The Chair briefly summarised the results of the ‘brainstorming’ meeting before opening the floor to a discussion aimed at helping to draw up a recommendation. Concern was expressed by Committee members on the actual and potential negative effects of anthropogenic noise on cetaceans in the Agreement area. A long discussion took place, and some Committee members noted that concerning the issue of the anthropogenic noise in the sea and particularly the use of military sonar, there may be various ways to face the threats to cetaceans. Interesting arguments supporting various views on what should be the recommendation of the SC were heard. There is now general acceptance that mass strandings of cetaceans, and most notably of beaked whales (family Ziphiidae) may result from military sonar activities, also within the Agreement area. Itt was recognised that a number of monitoring and research projects need to be initiated to address questions related to the possible effects of anthropogenic noise in the ACCOBAMS area, including mapping of local ambient noise, the assessment of potential acoustic risk for individual target species, and the carrying out of targeted, well-defined experiments to identify and quantify actual and potential risk for individual species. The discussion also dealt with the need for specific management measures, which can be implemented already without invoking the need for further research. These included avoiding the use of military sonar in areas known to contain habitat of Cuvier’s beaked whales. Alexandros Frantzis noted that at no mitigation measures are currently known to exist that can guarantee that no harm to cetaceans will occur from the use of military sonar. Therefore, he insisted

that the SC should recommend a complete ban of the use of military sonar in the ACCOBAMS area, until sufficient knowledge will be gathered regarding both the abundance and distribution of beaked whales and the mechanisms through which military sonar has an impact on them. Other Committee members supported the view that given the defence needs of national navies and the NATO, such a recommendation would not be realistic and could have the opposite result that that aimed to, and that therefore the further development of appropriate mitigation measures would have a better overall conservation effect. The Committee therefore recommended that existing guidelines for the use of such sonar, developed by NATO and possibly by other organisations, be made available for review, with a view to developing common sets of guidelines for use in the Agreement area.

91. Throughout the discussion, it was noted that the Committee did not imply that military sonar represents the only important threat to cetaceans related to anthropogenic noise in the Agreement area. Rather, it reflects the fact that the cause-effect link in this situation is best understood at present. Other sources of underwater man-made noise known or presumed to affect cetaceans, such as those deriving from seismic exploration, are known to occur in the ACCOBAMS area. The Committee therefore recommended that guidelines existing in some countries for the use of such non-military sonic devices be also submitted for review. The Committee further recommended that preventive notification be obtained by the Permanent Secretariat of all activities, including military and industrial, that are known to produce underwater noise likely to harm cetaceans.

92. Recommendation no. 2.7 on man-made noise in the ACCOBAMS area (Annex 34g) was adopted by the Committee.

4.2.2: Ship collisions

93. A working paper on ship collision, SC2/Doc 23 (Annex 28), was presented by the Chair, where two different approaches to the problem were suggested: an impact assessment and the development of mitigation measures. During the discussion it was suggested that, although both sperm and fin whales appear to be the most impacted species, the latter could be a very promising study subject because of its abundance in the Ligurian Sea (where maritime traffic is most intense particularly during the summer), and because population size and density data exist for that species in that area. The Committee thus suggested that an *ad hoc* workshop be organised, possibly in cooperation with the Pelagos Sanctuary, ideally to be held in the context (e.g., immediately before) of the fin whale workshop referred to in Recommendation 2.6. Daniel Cebrian mentioned that if the species selected as a study subject for the workshop is the fin whale, the Barcelona Convention might more easily support it.

94. The Committee adopted Recommendation 2.8 on this subject (Annex 34h).

4.2.3: Eco-labelling

95. Based on a request from the first meeting of the Bureau, asking the SC to establish a list of activities that would benefit from eco-labelling, an expert was asked to prepare a study on this proposal, SC2/Inf 14 (Annex 29). Eco-labelling and, in a broader scope, low-cost uses and activities, must be encouraged to strengthen the conservation of cetaceans in the ACCOBAMS area. This also concerns the wise use of the main resources along the trophic chain. The purpose of the study is to provide the Parties and the Scientific Committee with suggestions to go forward in their work to orientate the stakeholders in elaborating non-binding tools - in particular, guidelines, guidance, charts, code of practice, etc. - which may serve as reference to certify and/or give labels to users and companies, for example which will develop activities interfering with the status of conservation of cetaceans on the basis of these recommendations. In this pursuit, the study will:

(a) Identify the main uses and activities which may affect cetaceans;
(b) Determine the legal questions which result from them; and

(c) Review the existing regulations which may be imposed to conserve cetaceans in a better way.

The results of the study will be the following:

(a) A framework document of to facilitate the work of the scientific committee and of the parties in designing technical recommendations which will encourage low cost uses and activities affecting cetaceans;
(b) Suggestions in the different fields of law to develop binding and non-binding legal instruments such as regulations, contracts, certification, labelling, guidance, guidelines charters etc.

The conclusions of this work will be made available to the Secretariat in the coming weeks.

4.2.4: Prey depletion

96. The Chair presented a document on the subject, SC2/Doc 22, with suggestions to approach the problem (Annex 30). The Chair also informed of the likeliness that CIESM will approach this matter through an international workshop on the role of cetaceans in the ecosystem, with an emphasis on the Mediterranean, where leading experts on the issue of cetaceans and marine trophic webs would be invited. The outcome of such workshop could be forwarded to the SC of ACCOBAMS, thus stimulating a set of *ad hoc* recommendations from SC to MoP to engage in further action in this field. Donovan informed the meeting that the proceedings are available from an IWC workshop on the subject, which was held in La Jolla, California, in 2002 (*Journal of Cetacean Research and Management* 6 (supplement): 2004, in press). He noted the difficulties and complexities inherent in ecosystem modelling and urged that a broad range of experts be invited to the CIESM workshop.

4.2.5: Indicators

97. The Chair briefly presented SC2/Doc 18 (Annex 31), which had been prepared by WDCS. A discussion followed in which the importance of identifying suitable indicators to assess the conservation success of ACCOBAMS was emphasised. The Committee thanked WDCS for its contribution and the Chair agreed to contact Mark Simmonds in order to see which progress can be made in this direction.

98. Notwithstanding the above, the Committee agrees that the highest priority for research in the ACCOBAMS region should be accorded to obtaining ‘baseline’ abundance estimates and temporal/geographical distribution maps. Without this, along with a well-designed monitoring programme, it will not be possible to determine whether ACCOBAMS is meeting its conservation objectives.

99. The Committee adopted Recommendation n. 2.9 on the fundamental need for information on abundance and distribution of cetaceans within the ACCOBAMS area (Annex 34i).

AGENDA ITEM 5: Any other business

5.1: Release of Dolphins in the Black Sea

100. The Chair briefly informed the meeting that the Committee’s opinion had recently been requested by the Secretariat concerning the prospected release in the Black Sea of bottlenose dolphins, apparently of Black Sea origin, which are currently being kept captive on the Red Sea coast of Israel. Such opinion had been transmitted to the Israel CITES authority by the Chair with a letter which was distributed at the meeting as SC2/Inf 11 (Annex 32).

101. Simon Nemtzov, Israel's CITES authority, was invited at the meeting and gave a report on this matter, explaining the circumstances of the prospected release in greater detail. A discussion followed on the advisability of releasing these dolphins and/or recommending ways of completing this action.

102. The highest concern was unanimously expressed by the Committee on the risks that such release, and other similar operations, might bring to wild populations of dolphins through the potential introduction in the environment of exotic pathogens and genetic mixing. Furthermore, the Committee was concerned that the chances of survival of the dolphins to be released, many of which are captive-born, were very low due to marked differences existing between the Black Sea environmental conditions and those of the Red Sea.

In conclusion, the Committee agreed that: (1) at the population level, the only possible effects of such a release were negative; (2) at the individual animal level, the prospects for survival of the animals (all but one were captive-born) were very poor. It therefore strongly advised against granting a permit for the proposed release programme.

103. It was further decided that Anastasia Komnenou would convene a small drafting group, to develop a more detailed response for the Israeli CITES authority. Such a document, to be drafted along the lines outlined in SC2/Inf 11, would also include guidelines for wider applications concerning the future release of captive dolphins in the ACCOBAMS area. The proposed guidelines and response should be circulated to the Committee for final review and approval by the beginning of March 2004, if at all possible.

104. The Committee noted with concern that there is increasing interest in the Agreement area for commercial operations involving "swim-with" and "dolphin-assisted therapy" (DAT) programmes in controlled environments (including captive facilities and enclosed and semi-enclosed sea areas), to the extent that such operations are likely to cause increasing conservation problems to wild cetacean populations through illegal takes and reintroductions.

105. The Committee noted as well that similar operations involving swim-with and DAT programmes, which are conducted in the wild, are also reported to be increasing in the Agreement area. The Guidelines for Commercial Cetacean Watching Activities in the ACCOBAMS Area (SC2/Inf 1, Point 4) advise against such activities. The Committee is therefore concerned about the possible detrimental effects for the cetaceans exposed to direct contact with human swimmers, as these have a potential to cause disease transmission, short-term behavioural disruption, and long-term behavioural and ecological changes. The Committee agreed to keep this matter under consideration.

5.2: Updating of Appendices to CMS

106. The Chair reminded participants that Appendix II of CMS includes cetacean populations in the Agreement area that are not listed properly based on current scientific knowledge (Annex 33).

107. Alexandros Frantzis further noted that also Annex II to the E.U. "Habitats Directive" failed to include cetacean species that are highly endangered in the region, such as *Delphinus delphis,* which are found in the Community's coastal waters, and *Physeter macrocephalus*, which is often found nearshore.

108. The Committee requested the ES to prepare a recommendation to MoP2 to solicit appropriate amendments from the relevant authorities, and declared its availability to provide scientific support to the formulation of such a recommendation, should any be needed.

5.3: IUCN Red List

109. The Chair remarked that there is considerable overlap between the work of the IUCN SSC's Cetacean Specialist Group and that of the Scientific Committee of ACCOBAMS, in their respective effort of assessing the levels of threat of cetacean populations found in the Agreement Area, and further noted that a harmonisation of such effort within a proper joint institutional arrangement would greatly enhance reciprocal efficiency. In particular, the current process of evaluating threats to cetaceans by the SC is difficult to separate from the Red List assessment of cetacean populations. The meeting agreed to suggest to the ES that a memorandum between both parties be developed in the interest of efficiency and harmonisation of efforts.

5.4: Cetacean research and conservation in Slovenia

110. The Committee was pleased to receive a report from the Adriatic Project Society on cetacean research and conservation activities in Slovenia.

AGENDA ITEM 6: Recommendations to MoP2

111. The Committee developed a number of important recommendations for *inter alia* the consideration of the Meeting of the Parties. These are annexed to this report.

AGENDA ITEM 7: Date and venue of next Meeting

112. The Third Meeting of the Scientific Committee will be scheduled to take place early in 2005, a few months after the Second Meeting of the Parties of ACCOBAMS. A venue for such meeting has not been identified at the moment. The ES assured the Committee that information concerning date and venue of the next meeting will be provided as soon as possible.

113. The Committee suggested that a small working group be given the task, well ahead of the next meeting, of suggesting ways in which future meetings can be organised (e.g., duration of the meeting, relationship with satellite events, workshops, 'brainstorming' etc., degree of detail to be afforded to scientific discussions, broad participation in the meeting, etc.).

AGENDA ITEM 8: Adoption of Report

114. The Committee thanked the Secretariat and rapporteurs (Catherine Lehman, Donna Usher) for managing to produce a draft report so swiftly in difficult circumstances. The report was provisionally adopted by the Scientific Committee on 22 November 2003; the text of the recommendations was formally adopted. Given the need for extensive editing of some sections, it was agreed that the Chair would prepare a revised draft for circulation among Committee Members, who would be given one week for comments. The Chair would then submit the final report to the Secretariat.

AGENDA ITEM 9: Close of Meeting

115. The meeting closed at 16.30 hours, after thanks were extended to the Government of Turkey, the Secretariat and rapporteurs, and the Chair.

ANNEX I

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ANNEX II

RULES OF PROCEDURE

RULES OF PROCEDURE OF THE SCIENTIFIC COMMITTEE OF THE AGREEMENT ON THE CONSERVATION OF CETACEANS OF THE BLACK SEA, THE MEDITERRANEAN SEA AND CONTIGUOUS ATLANTIC AREA (ACCOBAMS)

GENERAL FUNCTIONS

Rule 1

The Scientific Committee, established in accordance with Article VII of the Agreement, provides scientific advice and information to the Meeting of the Parties or through the Secretariat to the Parties. Its functions are defined in Article VII, paragraph 3 of the Agreement.

Rule 2

In particular, the Scientific Committee provides recommendations to the Meeting of the Parties concerning the implementation of the Agreement and of the Conservation Plan, and on further research to be carried out.

MEMBERSHIP

Rule 3

The Scientific Committee, as determined by the Meeting of the Parties (Res 1.3 -as annexed), shall consist of 12 members:

a) One qualified expert representing each of the four geographical regions as in annex 1. One alternate will be designated for each of the above experts, to participate in meetings only in the absence of the corresponding delegate. b) Five qualified experts in cetacean conservation appointed by the Director General of CIESM following consultation with the Permanent Secretariat of the Agreement; c) One representative each from the World Conservation Union (IUCN), the European Cetacean Society (ECS) and the Scientific Committee of the International Whaling Commission (IWC), each of them appointed by the corresponding Organization.

REPRESENTATION AND PARTICIPATION

Rule 4
Members

4.1 The geographical region representation shall be reviewed at an ordinary session of the Meeting of the Parties, in accordance with the Rules of Procedure of the Meeting. The terms of office of those members shall expire at the close of the ordinary Meeting following that at which they were appointed.

4.2 The same provisions shall apply with respect to alternate members.

4.3 The mandate of the five qualified cetacean conservation experts nominated by the CIESM in consultation with the Executive Secretariat shall be reviewed at each ordinary session of the Meeting of the Parties in the same way they have been nominated.

4.4 At each ordinary session of the Meeting of the Parties ECS, IUCN and IWC shall be invited to appoint a representative to the Committee.

Rule 5
Observers

5.1 The Chairperson, in consultation with the Executive Secretary, may invite observers representing riparian Countries.
5.2 Without prejudice to Rule 3, the Chairperson, in consultation with the Executive Secretary and accordance with the agenda, may admit a limited number of observers from specialised international Inter-Governmental and Non-Governmental Organisations and, in extraordinary circumstances, may admit one or more special guests.
5.3 If the following disciplines are not already represented on the Scientific Committee, the Chairperson, in consultation with the Executive Secretary, may invite specialists in environmental law, fisheries and socio-economics, and in any other field relevant to the agenda.

Rule 6
Secretariat

The Secretariat of the Agreement, with the support of the Sub-Regional Co-ordination Units, shall undertake secretarial tasks during the meetings of the Scientific Committee and shall provide administrative and logistical support.

BUREAU

Rule 7

7.1 The members of the Committee shall elect their own Chairperson.
7.2 This election will take place at the first meeting of the Scientific Committee following the Meeting of the Parties, and the newly elected Chair shall assume his/her functions immediately upon election. Such function will expire at the end of the following Meeting of the Parties.
7.3 The Chairperson shall preside all meetings of the Scientific Committee, approve the provisional agenda prepared by the Secretariat for circulation, and liaise with members between meetings of the Committee. The Chairperson may represent the Committee as required, within the limits of the Committee mandate, and shall carry out such other functions as may be delegated to him/her by the Committee.
7.4 In the event of the Chairperson being absent or unable to discharge the duties of Presiding Officer, the Committee will appoint one of its members to conduct the Meeting.

DECISIONS

Rule 8

Decisions of the Committee shall be taken by consensus unless a vote is requested by the Chairperson or by at least four members.

Rule 9
Methods of Voting

9.1 Each Committee Member shall have one vote.
9.2 The Committee shall normally vote by show of hands at a meeting, but any Committee Member may request a roll-call vote. In the event of a vote during an inter-sessional period, there will be a postal ballot.
9.3 At the election of officers, any Committee Member may request a secret ballot. If seconded, the question of whether a secret ballot should be held shall immediately be voted upon. The motion for a secret ballot may not be conducted by secret ballot.

Rule 10
Majority and voting procedures

All votes shall be taken by simple majority among members present and voting. In the case of a tie, the proposal shall be considered rejected.

MEETINGS

Rule 11

Meetings of the Committee shall be convened in general on the basis of one annual meeting by the Secretariat of the Agreement in consultation with the General Secretariat of the CIESM and the Chair of the Committee. Extraordinary meetings shall only be convened with the agreement of the Contracting Parties Bureau Members.

Rule 12

When in the opinion of the Committee an emergency arises, requiring the adoption of immediate measures to avoid deterioration of the conservation status of one or more cetacean species, the Chairperson may ask the Agreement Secretariat to contact the relevant Parties urgently.

Rule 13

Notices of meetings, including date and venue, shall be sent to all Parties by the Secretariat at least 45 days in advance and, in the case of extraordinary meetings, at least 14 days in advance.

Rule 14

A quorum for an ordinary meeting shall consist of the two third of the members of the Committee.
This quorum shall be reduced to half of the members in extraordinary meetings. No decision shall be taken at a meeting in the absence of a quorum.

Rule 15

An executive summary of each meeting shall be prepared by the Secretariat as soon as possible and shall be communicated to all members of the Committee, to all Parties and non Parties, all riparian States and "ACCOBAMS Partners".

Rule 16

a) The working language is English. However, simultaneous interpretations in French and English will be provided upon availability of funds. b) The working documents are distributed in English. French translation, in some case will be possible upon availability of funds.

WORKING GROUPS

Rule 17

The Committee may establish *ad hoc* working groups as needed to deal with specific tasks. It shall define the terms of reference and composition of each working group. The meetings of these working groups will be held, when possible, in conjunction with other events.

Rule 18

Insofar as they are applicable, these Rules shall apply *mutatis mutandis* to the proceedings of working groups.

Rule 19

The Committee shall receive reports from other relevant meetings and working groups established under the Agreement, when necessary.

COMMUNICATION PROCEDURE

Rule 20

In application of Article II.2 of the Agreement, any Party may ask for advice on derogations. The Secretariat shall communicate the request to the members for advice within 30 days. The advice received within the 30 days will be immediately communicated to the requesting Party.

Rule 21

Between sessions, any member, the Sub-Regional Co-ordination Unit or the Secretariat may submit through the Secretariat a written proposal to the Chairperson for decision. The Secretariat shall communicate the proposal to members for comment within 60 days of the date of that communication. Any comments received within the 60-day period shall also be communicated to members.

Rule 22

If, by the date on which comments on a proposal were due to be communicated, the Secretariat has not received any objection from a member of the Committee, the proposal shall be adopted, and notice of the adoption shall be given to all members.

Rule 23

If any member objects to a proposal within the 60 days time limit, the proposal shall be referred to the next meeting of the Committee.

OTHER FUNCTIONS

Rule 24

To each ordinary Meeting of the Parties the Chairperson shall submit a written report on the Committee's work since the previous ordinary Meeting.

PROCEDURE

Rule 25

These Rules shall apply at the first meeting of the Committee.

AMENDMENTS

Rule 26

The Rules of Procedure may be amended as required by a decision of the Committee.

ANNEX III

ADOPTED AGENDA

1. Opening of the Meeting

2. Adoption of the Rules of Procedure

3. Adoption of the Agenda

4. Implementation of the ACCOBAMS work plan

4.1 Update on intersessional activities

4.1.1 Accobams Science Website
4.1.2 Operational procedures (WG1)
4.1.3 Whale watching guidelines (WG2)
4.1.4 Competitive interactions (WG3)
4.1.5 Cetacean bycatch database
4.1.6 Pilot conservation and management actions
4.1.7 Workshop on habitat degradation
4.1.8 Conservation plan for cetaceans in the Black Sea
4.1.9 Conservation plan for common dolphins in the Mediterranean Sea
4.1.10 Conservation plan for bottlenose dolphins in the Mediterranean Sea (WG4)
4.1.11 Basin-wide sperm whale survey (WG5)
4.1.12 Fin whale conservation activities
4.1.13 Photo-identification training activities (WG6)
4.1.14 Capacity building strategy (WG7)
4.1.15 Educational tool kit
4.1.16 Tissue banks (WG8)
4.1.17 Emergency Task Force (WG9)
4.1.18 Strandings protocol and database
4.1.19 Cooperation with international organizations
4.1.20 Joint Working Programme CBD/CMS, and GROMS (WG10)
4.1.21 Precautionary principle guidelines (WG11)

4.2 Actions to be developed

4.2.1 Anthropogenic noise
4.2.2 Ship collisions
4.2.3 Stranding networks
4.2.4 Eco-labelling (by request of the Bureau)
4.2.5 Prey depletion
4.2.6 Indicators

5. Recommendations to MoP2

6. Any other business

7. Date and venue of next Meeting

8. Adoption of Report

9. Close of Meeting

ANNEX IV

ACCOBAMS SCIENCE WEBSITE

Progress Report 2003

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The ACCOBAMS Secretariat has promoted the development of a "Science" section of the ACCOBAMS web site, that features all activities conducted by the Scientific Committee as well as relevant research, conservation, capacity building and public awareness actions.
The ACCOBAMScience web site can be seen online at:
http://www.accobams.org/index_science.htm

The site is currently composed of 112 html pages for a total of 368 files. It includes a general section introducing the Agreement, pages describing the Scientific Committee and its Working Groups, and a presentation of ACCOBAMS partners including Institutions and NGOs.
The site, which can function as a tool for cetacean research and conservation, features a "Resources" section including useful links for people working on cetaceans and a download area.
The first page of the ACCOBAMScience web site shows a variable series of "feature" items, which can be posted there according to ACCOBAMS priorities. At present, this area includes an interactive version of selected parts of the ACCOBAMS report "Cetaceans of the Mediterranean and Black Seas: State of Knowledge and Conservation Strategies", which can be downloaded as full document or single contributions. Selected sections include the "species impact table", cetacean names in all languages relevant to the Agreement area, and a section featuring information on all cetaceans living in the Agreement area, together with species drawings by Massimo Demma and distribution maps.
ACCOBAMS "News" and "Events" are listed in the first page and can be seen in separate sections of the site.
The site includes a **database** system aimed at a comprehensive review of all cetacean-related activities in the Mediterranean and Black Seas. The database will allow to collect detailed and continuously updated information on cetacean research projects, whale watching activities, organisations and individuals working on cetaceans in the Agreement area. This fully interactive database allows easy data entry and sorting. All submitted information are automatically submitted to a moderator for approval before being included in the ACCOBAMS system. At regular intervals, ACCOBAMS will produce comprehensive reports that will be distributed to the concerned parties. This can be done through a series of "export data" functions in the database administration section.
The site also has a "Restricted area" for internal use by the Scientific Committee.
The ACCOBAMScience web site was conceived and designed by Giovanni Bearzi / Tethys Research Institute based on input provided by Giuseppe Notarbartolo di Sciara and by the ACCOBAMS Secretariat.

All the .php programming for the database was performed by Alvise Rabitti, who was subcontracted by Tethys.

ANNEX V

OPERATIONAL PROCEDURES
FOR THE SCIENTIFIC COMMITTEE

Report on activities conducted on Action 2 arising from SC1

Alex Aguilar, Department of Animal Biology, Faculty of Biology, University of Barcelona, Spain

and

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Background: The first meeting of the parties approved the Rules of Procedure to be followed by the Scientific Committee. These were reviewed at the first meeting of this body and were adopted after the introduction of some amendments. However, the need to establish procedures for submission of proposals to be considered by the Scientific Committee was also identified, but a set of procedures or guidelines could not be properly discussed and agreed within SC1. To deal with the proposals already submitted for consideration to SC1, an ad-hoc Advisory Committee was then established and a working group created to draft a set of operational guidelines to be used in the future. This draft was to be circulated at SC2.

Action taken: The working group worked by correspondence and addressed the necessity to define clear procedures for an appropriate reviewing and for the evaluation of research or management proposals presented to the Scientific Committee between their sessions. A proposal for Operational Guidelines of the SC was agreed and is here appended for consideration.

Procedures for the evaluation of research or management proposals

a. Between sessions, the Scientific Committee may be requested by the Secretariat to provide opinions on research or management proposals, which have been submitted to ACCOBAMS for endorsement, for advice, or for funding. Proposals will be treated differently depending on whether they require funding or not.

b. Proposals may be submitted in writing at any time of the year. The Secretariat shall pass the proposal to the Chair, who would ask a Scientific Committee member, or a group of Scientific Committee members, or, if necessary, a group of independent experts, to evaluate it and draft an opinion within 30 days. This opinion will then be circulated to all Scientific Committee members, who shall eventually suggest modifications within 15 days. The Secretariat shall inform proposers of this time schedule in order to avoid pressure derived from submissions made “on the rush”.

c. Proposals requiring funding would be treated as in (b). In addition, given the limitation of funds, the Secretariat shall provide to the Scientific Committee, together with the proposal (which should include a budgetary appraisal), relevant information concerning the availability of funds in line with the program-budget adopted by MOP, the expected income, and its opinion on the need to find additional contributions. The Scientific Committee shall recommend that funds be granted taking such information into account. If funds are not available, the Scientific Committee may recommend that the proposal be funded as soon as funds are secured. According to resolution MOP1 1.7 (6), the Scientific Committee, together with the Sub-Regional Coordination Units, will assist the Secretariat in consulting with the Parties and potential sponsors concerning sponsorship.

d. Proposals submitted at the annual Scientific Committee meeting will follow the same procedure, i.e., answered within 45 days.

ANNEX VI

WHALE WATCHING GUIDELINES

Guidelines for commercial cetacean-watching activities in the ACCOBAMS area

Point 1
Scope of the Guidelines

The ACCOBAMS Guidelines presented here address those cetacean-watching activities carried out for commercial purposes and subject to the jurisdiction of the Parties to ACCOBAMS. The Guidelines relate to all marine activities where funds are being generated from whale or dolphin watching and this may include research activities that have a commercial component[2].

They are intended to serve as a framework for the development of more detailed guidelines by national and regional authorities[3] at a local level. The ACCOBAMS Guidelines should be used to identify what issues need to be addressed and how this may be appropriately done.

Variations on this framework will be required to cater for different species[4], different geographical considerations and differences in other human activities within the area where whale watching is occurring or planned to occur.

Help in the interpretation and development of guidelines can be sought from ACCOBAMS and these framework guidelines will be subject to regular review and amendment by the ACCOBAMS scientific committee[5].

The implementation of these guidelines is in accord with Article 2 of ACCOBAMS.

Point 2
Impact assessment

Before allowing cetacean-watching activities to commence, the Parties should make a formal assessment of their potential impact on the favourable conservation status of cetaceans. Advice relating to how to conduct such an assessment may be sought from ACCOBAMS.

No new cetacean-watching activities should be authorised if there are threats of significant adverse impact on the behavioural patterns or physiological well-being of cetaceans[6].

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[2] This is one issue where the appropriate authorities should decide the scope of activities to be included within the guidelines. The options are

a. All marine activities that include whale or dolphin watching as a means of raising funds, including all commercial and research activities; or
b. All marine activities that include whale or dolphin watching as a means of raising funds, including all commercial activities but excluding primarily research activities, which should be separately licensed, perhaps by a special permit system.

The authorities should also pay special attention to those whale watching activities run by conservation organisations and which contribute to cetacean conservation by research or education or in some other fashion. In such cases, a special permit may again be appropriate.

[3] "Authorities" here is intended to primarily mean the relevant parts of the government (i.e. ministries or agencies) of ACCOBAMS Parties which have appropriate powers and interests. It may also include other bodies, including for example regional integration bodies, if such bodies have appropriate interests and powers.

[4] In fact it may be necessary to develop variations on these guidelines for different portions of populations (for example mothers and calves in breeding areas may be more sensitive to disturbance and displacement.)

[5] Those intending to make use of this framework are recommended to verify that they are using the most-up-to-date version by checking with the ACCOBAMS Secretariat.

[6] The precautionary principle should be employed in every instance (meaning that the benefit of any doubt should be given to the animals).

Based on the results of the impact assessment, the authorities should establish conditions under which cetacean watching may be established. The types of conditions are outlined below.

The impact assessment should be repeated at periodic intervals of between five and ten years.

Point 3
Permits

Commercial Operations

Any commercial cetacean-watching activity should only be carried out under a permit granted by the appropriate authority. Permits for commercial operations should be issued by area, with a restricted number of commercial vessels operating in any given area on a given day.

Special Permits

On occasion, activities such as research or media work may require individuals or vessels to approach whales at a distance closer than that identified below. In such cases, it is suggested that special permits, issued by appropriate authorities, be required. Advice on the issuance of special permits can be sought from ACCOBAMS.

Criteria

Before issuing a permit or certification, the authorities should be satisfied that there is substantial compliance with the following criteria:

a. That the commercial operation should not have any discernable adverse effect on the behavioural patterns of the cetacean to which the application refers;

b. That it should not conflict with the conservation, management, or protection of the cetacean concerned;

c. That the proposed operator, and the operator's staff who may come in contact with cetacean, should have sufficient experience with cetacean;

d. That the proposed operator, and the operator's staff who may come into contact with cetacean, should have sufficient knowledge of the local area and of the sea and weather conditions;

e. That the commercial operation should have sufficient educational value to participants or to the public;

f. That the commercial operation, when possible, facilitates the collection of scientific data and ultimately the publication of these data in a useful form[7];

g. That the vessel used meets appropriate national safety standards;

h. That the vessel used be insured for the passengers that it carries; and

i. That the vessel be judged appropriate for whale watching.

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[7] To be useful data need to be collated, analysed and ultimately published. This may require consultation with appropriate scientists.

Applications

To obtain such a permit, vessel or aircraft based cetacean-watching operations would be expected to submit to the competent authority an application in writing setting out relevant information that should include the following:

a) the type[8], number and speed of vessels or aircraft intended for use and the maximum number of vessels or aircraft the operator proposes to operate at any time;
b) where possible, information relating to the noise level of each vessel or aircraft both above and below the sea;
c) the area of operation;
d) the base or bases of the operation;
e) the duration and frequency of trips;
f) the species of cetaceans with which the operation will be expected to have contact;
g) the nature of the contact (e.g. viewing from a boat's decks, an underwater-viewing platform or whether passengers will be entering the water);
h) the method of location of cetaceans;
i) the maximum number of passengers to be taken on board;
j) the persons in command of the vessel or aircraft, their qualifications and, where appropriate, those of their staff;
k) the educational information and materials that will be provided to the passengers (e.g. will there be an onboard commentary provided by a naturalist);
l) an outline of any research activities to be conducted in conjunction with the cetacean-watching;
m) where relevant[9], the minimum altitude that will be used in the presence of cetaceans; and
n) a commitment to keeping a daily log of cetacean watching activities that can be provided to the authorities at the end of a year/season.

Refusals

No permit should be granted if the competent authority is not satisfied that:

a) the operator and the staff who come into contact with cetaceans have sufficient experience with cetaceans;
b) the operator and the staff have sufficient knowledge of the local area and of sea and weather conditions;
c) the operator and the staff who come into contact with cetaceans have no convictions for offences involving the mistreatment of animals;
d) the operation proposed has sufficient educational value to the public; and
e) the vessel meets appropriate safety standards, including carrying safety equipment, and is adequately insured for such purpose.

Changes in permit agreements

The competent national authority should be able at any time suspend, revoke or amend a permit, or restrict the operation authorised by a permit, where:

a) the conservation status or welfare of the cetaceans is being threatened by the activity; and/or
b) the holder contravenes or fails to comply with any statutory requirement relating to cetacean-watching or any condition specified in the permit;

[8] The competent authority is also encouraged to consider whether the vessel is appropriate for use around cetaceans. Care should be taken to minimise the risk of injury and noise disturbance to cetaceans.
[9] For aircraft.

Point 4

Behaviour around cetaceans

Basic Principles

Noting that different conditions for conduct in the proximity of cetaceans may apply to different species and even for different sub-sections of a population (for example mothers and calves), the following recommendations for this aspect of codes of conduct will require specific development at the local level.

Ideally, the situation should be managed such that it allows cetaceans to control the nature and duration of the encounter.

Cetacean watch operators should have a “duty” to care for the animals that they exploit. Every effort should be made to minimise disturbance to cetaceans and avoid collisions between vessels.

The following basic principles should be established in codes of conduct and considered in the permitting process:

- vessels and aircraft should be operated so as not to disrupt the normal behaviour[10] of cetaceans;
- contact with cetaceans should be abandoned at any stage if they show signs of becoming disturbed or alarmed;
- there should be periods during the day when the animals are not subjected to whale watching activities by any vessel, including those in possession of a research or filming licence/permit. These “quiet periods” should be at least one third of the period of daylight;
- particular care should be taken when calves are present; and
- no rubbish, sewage or other polluting substances (including oil) or food should be disposed of in the proximity of the cetaceans.

Managing Vessel[11] Activity in the proximity of cetaceans

Except in circumstances of human safety or other emergency:

- operators should avoid having more than one vessel watching a marine mammal or a cohesive group of cetacean;
- if more than one vessel is in the approach zone[12], they should be in radio communication to coordinate their movements around cetacean;
- a dedicated observer should be on duty wherever possible in addition to the captain of the vessel;
- care should be taken such that no cetacean should be separated from a group or a mother from her calf or that a group be dispersed;
- under no circumstances should cetaceans be driven or their movements blocked by vessels;
- sudden or repeated change in the speed or direction of vessels or aircraft should not be made except in the case of an emergency;
- vessels should not drift down towards cetaceans;
- if cetaceans approach the vessel or bowride, maintain a slow[13], steady speed without changing course [14];

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[10] Advice concerning what constitutes “normal behaviour”, disturbance and alarm can be sought from ACCOBAMS.

[11] Vessels here include all motorized, paddle and sail craft. Personal motorized craft (jet skis and similar craft) are not suitable for watching whales and dolphins and permits should not be issued to such craft.

[12] See note below concerning zones.

- where a vessel stops to enable the passengers to watch a cetacean, the engines should be placed in neutral;
- when departing from watching cetaceans it is of importance to determine where the animals are relative to the vessel to avoid collisions or coming too close to the animals. In some circumstances it may be necessary to wait for animals to return to the surface from a dive to be certain as to their position[15];
- cetaceans should never be approached head-on, but from the rear or the side, nor should they be closely paralleled by vessels or approached by vessels under sail; and
- isolated mother and calf pairs and isolated calves should also be left alone, as should animals that appear to be resting or avoiding vessels.

Special Considerations for Sperm Whales[16]:

a. when a sperm whale abruptly changes its orientation or starts to make short dives of about 1 to 5 minute durations without showing its tail flukes, the vessel should leave the watching zone at a no wake speed until outside of the approach zone;
b. do not stay with a sperm whale or group of sperm whales for more than 3 of the whales' dive sequences; and
c. do not stay with a social group of sperm whales for more than 15 minutes.

Swim-with

- Because of the risks to cetaceans and humans there should be a presumption against commercial programmes that include entering the water with the animals. Only under exceptional circumstances should such "swim-with" programmes be licensed.

Zones

- Except in circumstances where the cetaceans themselves choose to approach, vessels should always maintain themselves at a particular distance from the animals being watched. In the case of large whales, 100m is recommended and, for dolphins, 50m. Vessels at this distance from the animals are at the edge of the "Watching Zone";
- between the watching zone and a distance of 300m from the animals, vessels should maintain a slow and constant no-wake speed this should allow them to close with the animals but not chase them. The area between 300m and the watching zone is the "Approach Zone";
- a vessel departing from the vicinity of cetaceans should also proceed slowly (i.e. travelling at no more than 6 knots), until it is at least 300 metres from the nearest cetacean;
- only one vessel at any one time should be in the watch zone and no more than two in the approach zone;
- time in the watching zone should be limited; periods of twenty or thirty minutes may be appropriate[17];

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13 For guidance 6 knots and below could be considered as slow.

14 If unsure of their movements, operators should slow down gradually and put the engine into neutral.

15 This may particularly apply to deep diving cetaceans.

16 The particular biology of sperm whales makes it necessary to have specific guidelines for them and this section serves as a reminder that similar species-specific aspects of guidelines may need to be produced for other species.

17 This may vary in relation to local circumstances and the species involved. In circumstances where there are multiple whale watch operators working in one area, they will need to liaise with each other to manage access to the animals.

Managing Aircraft Activity in the proximity of cetaceans

- Helicopters should not be used for cetacean watching;
- no aircraft should be flown below 150 metres above sea level within the watching zone (i.e. 50m for dolphins and 100m for whales); and
- only one aircraft (or one vessel) should be over (or in) the watching zone at any one time.

- The Parties should organise training courses for operators and their staff (preferably including on-board naturalists) and, where appropriate, relevant authorities should grant them a dated certificate of proficiency that can be displayed; and
- refresher courses should also be offered and further training for on-board naturalists also be considered.

Point 6

Sanctions and remedies

- The Parties should impose sanctions of sufficient gravity to deter violations of the conditions identified in the permits issued and in the local guidelines, including the suspension or revocation of permits; and
- those who are responsible for violations should be required to compensate the damage in the form of restitution or mitigation.

Point 7

Other matters

Detection of cetaceans

The use by cetacean watching operations of sonar systems that emit noise to detect cetaceans or to bring them to the surface should not be permitted under any circumstances.

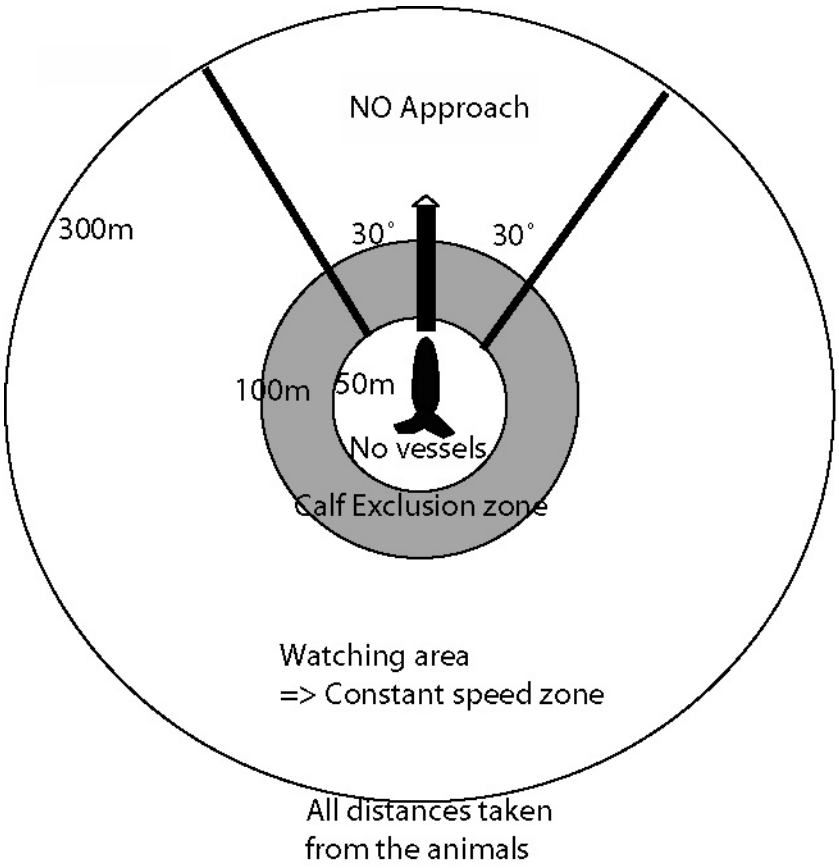
Consideration should be given to banning or limiting the use of passive whale detection systems (e.g. hydrophones) where it is believed that they may cause cetacean watching activities to become too concentrated.

Implementation

Arrangements should be made to allow independent inspection of cetacean watching activities to ensure compliance with guidelines. One consideration for continued licensing of an operator would be appropriate compliance.

Whale Watching Associations

In order to encourage best practice and appropriate management of resources, consideration in any one area or region may be given to the development of an Association of whale watch operators.


NO Approach
300m
30˚
30˚
100m
50m
No vessels
Calf Exclusion zone
Watching area
=> Constant speed zone
All distances taken
from the animals

ANNEX VII

COMPETITIVE INTERACTION

Report on the activities and of the ACCOBAMS Scientific committee Working group on competitive interactions between dolphins and fisheries (SC WG3) in the ACCOBAMS Agreement area.

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Introduction

The first meeting of the Scientific Committee of ACCOBAMS was held in Tunis between the 3rd and 5th of October 2002. During the meeting the members of the committee discussed Action 2 “Investigation of competitive interactions between coastal dolphins and artisanal fisheries” of the ACCOBAMS International Implementation Priorities for 2002 – 2006. (Resolution 1.9, The first Meeting of the Parties to the Agreement). The outcome concluded was there is a necessity to establish a working group that will develop a procedure for collecting the relevant information, including the preparation of a questionnaire in order to provide a report to the committee at its following meeting. It was decided that a working group will consist of four ACCOBAMS Scientific Committee Regional representatives and experts that could provide help in collecting the necessary information. At present the working group consists of the following members: Abdellatif BAYED, Akaki KOMAKHIDZE, Anastasia KOMNENOU and Draško HOLCER (acting also as a working group coordinator) as regional representatives, Giancarlo LAURIANO (ICRAM, Rome), Jordi LLEONART (Spanish Research Council (CSIC), Barcelona), Rafael ROBLES (FAO COPEMED), Caterina FORTUNA (ICRAM, Rome), Simon NORTHRIDGE (SMRU, University of St Andrews) and Giuseppe NOTARBARTOLO DI SCIARA (ACCOBAMS SC Chair).

Work concluded

After the initial establishment, working group on competitive interactions between dolphins and fisheries (SC WG3) started to prepare a questionnaire (annex 1) to collect relevant information on the existence of problem areas in which interactions between cetaceans and fishing or aquaculture activities occur. The initial task has been amended with the proposal to include also the collection of data on use of acoustic deterrent devices (ADD) due to the increasing concern of their influence and widespread use.

The concept of the questionnaire is for use by trained and experienced researchers to collect the necessary data. Hence the questionnaire is quite large and complex. The questionnaire is divided into four parts; first dealing with general knowledge on existence of interactions and the following three dealing with specific issues, namely interaction with fisheries, aquaculture and use of ADD. With that in mind the attached questionnaire was prepared, then circulated and finally accepted by the members of the Scientific Committee.

Further work to be done by the WG3 members is to develop a plan to collect the data needed and the actual data collection. It has been proposed that for this action regional representatives should get in contact with their colleagues in their regions and find out what are the possibilities (who can do the field work, how long it could take, how to finance it, what could be the budget, could it be funded by the member countries or funds will be requested from ACCOBAMS secretariat, etc). What has not been decided is the scale of the operations. On the first meeting of the SC it has been concluded that at this point only rough data are required to highlight potential trouble areas. For that reason data collection should target main fishing ports, areas and organisations to enable swift and most efficient data collection. To facilitate data collection main international organisations concerned with this issue, notably the European Commission and the FAO/GFCM, should be contacted.

ANNEX VIII

LIFE PROJECTS

LIFE projects funded between 2002 and 2003 on bottlenose dolphins of interest for ACCOBAMS

Information contained in: http://europa.eu.int/comm/environment/life/project/index.htm

Conservation of cetaceans and turtles in Andalusia and Murcia
LIFE02 NAT/E/008610

Beneficiary:
Sociedad Española de Cetáceos
C/ Nalón, 16, 28240 Hoyo de Manzanares, España

Project Manager:
Ricardo SAGARMINAGA VAN BUITEN
Email: sec@cetaceos.com

Project Objectives
This project intends to develop management models regarding turtles and cetaceans covered by the Habitats Directive and the locations which are important for their conservation that have been agreed upon with all the social sectors with interests in the sea. The project area, the southern coast of the Iberian Peninsula, is of great interest for these species due to its role as a corridor between the Mediterranean and the Atlantic and on account of the presence of substantial feeding and breeding areas. The project will develop a range of activities, from devising plans to manage habitats and species and applied research, to raising awareness in whole sectors of society. The keys to this project are consensus with the users and managers of the sea and the development of activities which involve local participation. Similarly, it is hoped that many of the planned actions, such as the removal of waste or a reduction in the impact of fishing techniques on turtles will serve as examples for the future, thanks to the participation of social groups which depend on the sea.

Year of Finance: 2002
Duration: 01-JUL-2002 to 30-JUN -2006

Conservation of *Tursiops truncatus* and *Caretta caretta* in La Gomera
LIFE03 NAT/E/000062

Beneficiary:
Sociedad para el estudio de los Cetáceos en el Archipiélago Canario (SECAC)
c/ El Greco, 17 - Edificio El Islote, 2° J, 35500 De Arrecife de Lanzarote (Canarias), España

Type of Organisation: NGO - Fondation

Project Manager: Vidal Martín Martel
Email: ziphius@teide.net

Project Objectives
The project's principal action will be the development of a management plan for the Santiago-Valle Gran Rey coastal belt in cooperation with all stakeholders. This will require, firstly, increased effort to improve the knowledge of the natural features, conservation status and threats to the site and target species. A physical and biological inventory of the environment and an assessment of human activities that affect both the species and their habitats will be implemented, including the development of indicators to allow for their long-term monitoring. Secondly, the project foresees establishment of a management and control structure in which all competent administrations and other stakeholder groups participate, so as to guarantee long-term application of the management plan.

Benefiting Countries and Regions: Spain (Canaries)

Year of Finance: 2003
Duration: 01-OCT-2003 to 31-MAR -2006

Activities for the protection of cetaceans in the international sanctuary
LIFE03 NAT/IT/000148

Beneficiary:
Consorzio Mediterraneo s.c.a.r.l.,
Via Nazionale, 243, 00184 Roma, Italia

Project Manager: Paolo Pelusi
Email: pelusi@mediterraneo.org

Type of Organisation: SME Small and medium sized enterprise

Project Objectives
The objective of the project, presented by a private marine research consortium, is to improve the coexistence between cetaceans and human activity within the Sanctuary of the Cetacean. The project will promote enforcement of specific agreements with shipping companies and, together with fishermen, draw up guidelines for sustainable fishing.To prevent accidental captures of dolphins, the beneficiary will apply acoustic deterrents to fishnets, over an equivalent of 100 km. A database on cetaceans and on the organizations involved in their protection will be set up and published on the internet, in order to increase knowledge and understanding of the species and related problems. Fishermen will be involved in data collection and offered a series of training courses. These will be aimed at raising awareness of problems affecting the species and at preventing or reducing damages caused by cetaceans. An information bureau will be set up and educational activities will be held in schools. Sustainable whale watching will also be promoted and a code of conduct for operators drawn up.

Benefiting Countries and Regions: Italia (Liguria, Toscana, Sardegna)

Year of Finance: 2003
Duration: 01-JUL-2003 to 31-DEC -2005

Limitation to the negative interactions between dolphins and human activities
LIFE03 NAT/F/000104

Beneficiary:
WWF France
188, rue de la Roquette, 75011 Paris, France

Project Manager: Cédric Du Monceau
Email: cdumonceau@wwf.fr

Type of Organisation:
NGO-Foundation

Project Objectives
The LINDA project aims at maintaining the populations of bottlenose dolphins in Corsica in an accurate status of conservation through securing an harmonious cohabitation between the presence of the species and the economic activities. The main stakeholders, local authorities and tourists will collaborate to develop sustainable fishing, yachting and whale-watching practices. For the achievement of these goals, the LINDA project intends to:
-Monitor the population of bottlenose dolphins and human activities affecting the species (sound pollution, interactions with fishing activities, yachting…) so as to assess the project impact and to produce a regional action plan for the species.
-Implement measures to minimise conflicts between bottlenose dolphins and fishermen (acoustic repellents on fishing nets, alternative fishing practices…)
-Promote dolphin-friendly management of activities related to water sports (motorboat racing, whale watching and yachting) and launch communication initiatives for public awareness.

Benefiting Countries and Regions: France (Corse)

Year of Finance: 2003
Duration: 01-NOV-2003 to 31-MAY -2007

ANNEX IX

PILOT CONSERVATION AND MANAGEMENT ACTIONS

Establishing Marine Protected Areas for Cetaceans in the ACCOBAMS Area

A Discussion Paper

by Giuseppe Notarbartolo di Sciara, 6 November 2003

ACCOBAMS provides for the use of marine protected areas (MPAs) as a tool for the conservation of cetaceans, both in the text of the Agreement[18] and in its Annex II, the "Conservation Plan"[19].

During their first Meeting (Monaco, Feb. – March 2002), the Parties to ACCOBAMS adopted a Resolution (Resolution 1.9) on the implementation of conservation priorities, which included 18 actions in its Annex. Of these, Action n° 4 (*Development and implementation of pilot conservation and management actions in well-defined key areas containing critical habitat for populations belonging to priority species*) identified four initial areas[20], each of them containing critical habitat for one of the four species of the Agreement area thought as being in greatest need of protection ("priority species"), in which pilot conservation and management projects be developed and implemented as soon as possible. Conservation measures envisaged would involve the establishment of MPAs encompassing critical habitat of the target species, and the adoption of experimental management plans with the involvement of local people and user groups. In its Resolution 1.9 (paragr. 8), the Meeting of Parties "calls on the Scientific Committee to further develop the actions needed to implement the priorities listed and described in Annex 1 … ".

During its first Meeting (Tunis, 3-5 October), the Scientific Committee of ACCOBAMS addressed the issue, and remarked that MPAs containing critical habitat of priority species should also be envisaged in other areas in addition to the four identified by the Meeting of the Parties. It was thus decided that proposals for additional areas in which to undertake such actions should be solicited from the conservation community at large, possibly through the Regional Representatives of the Scientific Committee, and sent to the Scientific Committee for an evaluation.

Goal of this discussion paper is to help stimulating the future work of the Scientific Committee in matters concerning MPAs for cetaceans, in order to facilitate the task of meeting the request from the Meeting of the Parties. In particular, this paper aims to:

1. Offer some introductory remarks on the usefulness of MPA for the protection of cetaceans in the Agreement area;
2. Briefly illustrate the so-called SPA Protocol to the Barcelona Convention, its main functioning mechanisms, and its relevance to ACCOBAMS;

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[18] Article II, 1, "**Purpose and conservation measures**. Parties shall take co-ordinated measures to achieve and maintain a favourable conservation status for cetaceans. To this end, Parties shall … co-operate to create and maintain a network of specially protected areas to conserve cetaceans."

[19] Article 3, "**Habitat protection**. Parties shall endeavour to establish and manage specially protected areas for cetaceans corresponding to the areas which serve as habitats of cetaceans and/or which provide important food resources for them. Such specially protected areas should be established within the framework of the Convention for the Protection of the Mediterranean Sea against Pollution, 1976, and its relevant protocol, or within the framework of other appropriate instruments."

[20] (a) the coastal waters surrounding the island of Kalamos, western Greece (short-beaked common dolphins); (b) the coastal area of southern Crimea, Ukraine, comprised between Cape Sarych and Cape Khersones (harbour porpoises and Black Sea common bottlenose dolphins); (c) the offshore waters of southern Crete, Greece (sperm whales); and (d) the waters of the Loŝinj-Kres Archipelago, Croatia (Mediterranean common bottlenose dolphins).

3. Provide suggestions for further action and progress.

MPAs for the protection of cetaceans in the ACCOBAMS Area

MPAs are increasingly recognised as a primary tool for the conservation of marine habitats and biodiversity. Whether MPAs can also effectively protect large, wide-ranging species, such as cetaceans, has been the subject of debate (e.g., Reeves 2000). Particularly in the case of protecting cetaceans, it is important to ensure that a proposed MPA makes conservation sense. Generally speaking, MPAs for cetacean protection should be proposed only if it is clear that the species to be protected is (are) not already protected with other means; for example, implementing legal measures targeting directly human activities known to impact on the species, or declaring a given species to be protected regardless of the animals' whereabouts, may be significantly faster and more cost-effective than establishing an MPA, considering the effort needed to put in place the political, socio-economic, financial public awareness and administrative set up needed for the latter.

However, the Mediterranean and Black Seas are a special case, because human presence, use and impact are extremely high and pervasive in this region. A simple indicator, the number of people living on the Mediterranean and Black Sea coasts (combined) per km^2 of marine surface (57, rising to 113 under the influx of summer tourist arrivals[21]), provides an idea of the intensity of the human presence in the region, compared with the rest of the world (almost seven times the global average[22], 17), and makes this marine region one of the world's most heavily populated.

The consequence of this is that in the Agreement region, even though it is illegal to deliberately kill cetaceans almost everywhere, special MPAs are needed to give cetaceans a greater protection and relief from human encroachment. By providing a legal means of managing human presence and activities, MPAs afford management, control and enforcement opportunities that do not exist elsewhere, and thus have the value-added benefit of reducing the chances of unintentional harm (e.g. bycatch, collisions), of providing better habitat conditions for prey, reducing noise levels, etc. In addition, MPA management plans may include provisions for interpretation, awareness, education and respectful fruition of cetaceans for which there may be little or no opportunity outside their limits. MPAs can provide an ideal framework for the conduction of robust scientific investigations and ecosystem studies, and combine them with socio-economic analyses and other management-oriented assessments. In such special areas set aside for cetacean conservation, consideration for the status of cetaceans can and must have the highest priority. In MPAs for cetaceans dangerous fishing practices such as driftnets may be forbidden, and the use of acoustic technology to exclude dolphins from their habitat may be restricted; due consideration may also be given to the maintenance of prey mass and quality needed to sustain a population of cetaceans, as can be possibly inferred from knowledge or hypothesis of pre-decline levels. Finally, disturbance can be monitored and maintained at a minimum. In conclusion, in consideration of the high level of human encroachment on the sea, it can be suggested that in the ACCOBAMS area MPAs have a specially important conservation value for cetaceans.

To be effective, MPAs for cetaceans must be designed with the goal of conserving the critical habitat of a particular population or populations, and therefore their main objective will be of enabling and implementing appropriate management of present and future human activities which are known to, or are likely to affect cetaceans and their habitat. Therefore, before an MPA can be conceived, information is needed on the geography and variability of the critical habitat to be protected, as well as knowledge of present and future human use of the area. Scientific methods for gathering such knowledge have recently made great progress, and are readily available for implementation.

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[21] Lowest Blue Plan scenario for tourist development in the Mediterranean in 2005. With the highest scenario the indicator rises to 147.

[22] Total world population divided by the global surface of the oceans and seas: a crude indicator, here included mainly to allow a gross comparison.

The SPA Protocol of the Barcelona Convention

Any riparian State has the power of establishing one or more MPAs in its territorial waters, and most have done so. Batisse and Jeudy de Grissac (1995) list 49 MPAs in the Mediterranean and four in the Black Sea, and several more were established since their work was published. However, significant levels of heterogeneity in the nature, governance, scope and effectiveness of MPAs are bound to exist in the absence of supra-national coordination at the regional level.

In the Mediterranean such useful role is provided by a protocol to the Barcelona Convention entitled "Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean" (also known as the "SPA Protocol", appended to this document as Annex 1), adopted in its revised form in 1995.

The SPA Protocol provides, among other things, for the establishment of Specially Protected Areas of Mediterranean Importance (SPAMIs), having very precise and stringent requirements in terms of management and effectiveness. Any Party to the Protocol may propose that part of its territorial waters be declared a SPAMI, and if requirements are met that SPAMI is eventually adopted and inscribed in the List of SPAMIs by the Ordinary Meeting of the Contracting Parties to the Barcelona Convention. To propose a SPAMI, a State must submit to the Convention a comprehensive document, compiled along the lines contained in an annotated format provided to the Parties by the Regional Activity Centre/Specially Protected Areas (RAC/SPA) of Tunis (the format is appended to this document as Annex 2).

Most importantly, as far as cetaceans are concerned, SPAMIs can also be established in the Mediterranean high seas, and all Parties to the Protocol are bound by the SPAMI regulations. The Pelagos Sanctuary for Mediterranean Cetaceans, established in 1999 by France, Italy and Monaco, was declared a SPAMI by the Barcelona Convention MOP in Monaco in 2001, and this enables management and conservation measures to be implemented there even though 53% of the Sanctuary lies outside the national jurisdiction of any State.

As recalled earlier in this document, as far as the Mediterranean is concerned, specially protected areas for cetaceans should be established by the Parties of ACCOBAMS within the framework of the SPA Protocol (Art. 3 of the Conservation Plan). This will ensure maximum compliance throughout the Agreement sub-region, and provide a supplement of solidity in terms of governance, management, effectiveness and visibility.

The suggestion is made here that the annotated format provided to Parties by the RAC/SPA for SPAMI proposals, modified and adapted to account for species-specific requirements and for the enlargement to the Black Sea and to the Contiguous Atlantic Area, be adopted for the formulation of proposals of MPAs for cetaceans in the ACCOBAMS area.

Some suggestions for future actions

a) A revision of the annotated format should be performed, to account for the special needs required in the establishment of protected areas for cetaceans, and extensible to all the sub-regions of the Agreement area. This task could be mandated to an *ad hoc* Working Group.
b) The revised annotated format should be tested as soon as possible through the formulation of draft proposals for the establishment of MPAs in the four areas indicated by MOP1. Proposals should be completed in time for presentation to MOP2. The Secretariat's assistance in this will be requested to address administrative and political concerns, given that some of the proposed areas fall within the competence of a Party, and others pertain to non-Party riparian States.
c) The regional representatives should be requested to solicit proposals from the scientific and conservation community at large for the designation of additional MPAs containing cetacean

critical habitat in special need of protection. Proposals drafted on the basis of the annotated format should be sent to the Scientific Committee for evaluation.

d) A working relationship should be established with the scientific advisory community of the Pelagos Sanctuary, the first and only SPAMI which was established with the specific purpose of protecting cetaceans and their habitats. An ACCOBAMS/Pelagos Joint Working Programme will not only enhance cetacean protection in the Sanctuary area; it will also help to refine methods of interaction between ACCOBAMS an specially protected areas for cetaceans established within its range.

References cited

Batisse M., Jeudy de Grissac A. 1995. Marine Region 3 : Mediterranean. pp. 77-104 in: G. Kelleher, C. Bleakley and S. Wells (Eds.), A global representative system of marine protected areas. Vol. I. Great Barrier Reef Marine Park Authority, World Bank, and World Conservation Union 219 pp.

Reeves, R.R. 2000. The value of sanctuaries, parks, and reserves (protected areas) as tools for conserving marine mammals. Contract report to Marine Mammal Commission, Contract No. T74465385. 50 pp. Available from: Marine Mammal Commission, 4340 East-West Highway, Room 905, Bethesda, Maryland 20814.

ANNEX X

WORKSHOP ON HABITAT DEGRADATION

Workshop on Methods for Evaluation of Habitat Degradation and its Effects on Cetacean Populations: Progress Report

Background information

The First Meeting of the Parties to ACCOBAMS in March 2002 adopted a number of priority actions, including Action 5 ("Workshop on methods for the evaluation of habitat degradation and its effect on cetacean populations"), which stated:

> "Physical and biological habitat degradation represents one of the greatest concerns for the conservation of cetaceans in the Agreement area. However, very little is known in terms of the real mechanisms at work, and how habitat degradation does impact on populations. To address the problem, a workshop is proposed to determine and help develop a framework and methodology to assess the significance for cetaceans of changes in their habitats, and to facilitate the eventual development of a research plan for the evaluation and quantification of cetacean habitat degradation in specific case studies. A scoping meeting for the preparation of such workshop, having the Mediterranean Sea as its focus, was conducted in 2001 under the auspices of the IWC, with funds from Italy and the UK. The workshop would focus on the following three points: (a) review available information on cetaceans and their habitats in the Agreement area and, in particular, studies that allow the comparisons to be made between segments of populations that appear to be responding to different levels of environmental stress; also, review available information on studies of major perturbations of cetacean habitat; (b) review and develop the concept of cetacean critical habitat and the development of quantifiable indices that may be applied to it; and (c) review and develop modelling approaches as part of a framework and methodology to assess the significance of changes in these parameters, with a view to developing a strategy for monitoring critical habitat quality, identifying thresholds which may affect cetaceans, assessing proposals for activities that might affect cetacean habitat, and, thereby, helping the Agreement in its work to conserve cetacean populations.

Activities:	Consultations, commissioning of papers, three-day workshop (25 partic.), workshop report
Duration:	1 year
Indicative budget:	€ 50.000"

During SC1 the matter wad debated, and the following is an excerpt from the Meetings report:

> Action 5: Workshop on methods to evaluate habitat degradation and its effect on cetacean populations.
> 34. The Chair requested the opinion of the AC. The AC recognized the importance of reviewing of the potential effects of habitat degradation on cetaceans in the Agreement area and the relevance of the proposed workshop (CS1/Doc 11) to ACCOBAMS priorities. Nevertheless, given the limited availability of funds and the existence of many other priority areas, the AC did not recommend funding this proposal at present. Given the extensive degradation of habitats within the Agreement area, it is likely that such changes have had an effect on the demography of cetacean populations in the Mediterranean and Black Seas. A considerable amount of scientific expertise in cetacean demography and environmental change exists within the IWC Scientific potential impact of habitat degradation on the demography of cetaceans in the Mediterranean and Black Seas.

When the Scientific Committee of the International Whaling Commission met in Berlin last June, a summary on the status of the Workshop was presented (Annex 1). A recent version of the proposal for the Workshop is also attached (Annex 2).

ANNEX a

Proposal for an IWC Special Workshop on Habitat Degradation

The importance of habitat protection has long been recognised by the IWC[23] and physical and biological habitat degradation is one of the eight priority topics established by the Scientific Committee. The Scientific Committee has held two special workshops, one on chemical pollutants in 1995 and the other on climate change and UV radiation in 1996. These workshops led to two environmental initiatives, Pollution 2000+ and the IWC SO-GLOBEC/CCAMLR collaboration, to which the Commission provided seed funding in 1999.

The United Nations Environment Programme (UNEP) recently urged countries to focus on coastal habitat degradation.[24]

An IWC habitat degradation workshop (HDW) has been under development since 2000, with a scoping meeting taking place in 2001. The report of this scoping meeting and the workshop proposal is published in the Journal of Cetacean Research and Management.[25] The objective of the proposed workshop is to develop methodologies to investigate the significance of changes in cetacean critical habitat. The workshop should facilitate the eventual development of a research plan for the evaluation and quantification of cetacean habitat degradation in specific model systems. The workshop has been repeatedly endorsed by the Scientific Committee, however adequate funds have not been available to the Environmental Concerns Working Group to allow this workshop to take place.

Relevance to ongoing work in the Commission

The Berlin Initiative notes the adoption of more than 100 conservation-oriented resolutions, several of which refer to habitat degradation or specifically request a habitat degradation workshop.[26] The Berlin

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[23] Resolution on preservation of the habitat of whales and the marine environment, 1980.

[24] UNEP Decision 22/1 Part II, Feb 2003 "Noting that the Plan of Implementation of the World Summit on Sustainable Development called, in its paragraph 36 (b), for the establishment by 2004 of "a regular process under the United Nations for global reporting and assessment of the state of the marine environment, including socio-economic aspects, both current and foreseeable, building on existing regional assessments",

Noting that the state of the marine environment is significantly affected by activities in coastal areas,

> Welcoming the decision of the General Assembly under its resolution 57/141 of 12 December 2002 on Oceans and the law of the sea, to establish "a regular process under the United Nations for global reporting and assessment of the state of the marine environment, including socio-economic aspects both current and foreseeable, building on existing regional assessments",

Considering the need to link science and policy-making and in that context to promote intergovernmental cooperation, mobilize the scientific community and foster inter-agency cooperation in support of a regular process for reporting and assessment of the state of the marine environment,

> Calls upon Governments to focus particular attention on coastal areas in collaboration with appropriate regional institutions involved in the coastal areas."

[25] Simmonds, M., Notarbartolo di Sciara, G., Reijnders, P., Taylor, M., Fortuna, C., Perry, C., Stachowitsch, M. and Fossi, C. 2002. Report of the Scientific Committee. Annex J. Report of the Standing Working Group on Environmental Concerns, Appendix 3. Report of the Scoping Group Meeting for the Habitat Degradation Workshop, 11-12 June 2001, Rome, Italy. J. Cetacean Res. Manage. (Suppl.)4:314-319.

[26] e.g. Resolution 2001-11 Resolution on the importance of habitat protection and integrated coastal zone management; Resolution 2000-7 Resolution on environmental change and cetaceans; Resolution 1999-5 Resolution on funding of high priority scientific research; Resolution 1998-5 Resolution on environmental changes and cetaceans

Initiative, if passed, will direct 'the Conservation Committee to explore how the Commission can coordinate its conservation agenda through greater collaboration with a wider range of other organizations and conventions including inter alia CMS, CCAMLR, IMO, IUCN and UNEP.'

The HDW therefore ties in nicely with this new conservation initiative. Moreover it could provide a mechanism to develop an integrated approach to all environmental threats.

Coastal areas typically exhibit the most degraded areas of the marine environment, due to their proximity to human activities, and the workshop might usefully focus on coastal habitats for this reason.

In addition, the workshop should explore the potential to carry out collaborative work with ongoing coastal zone management work under UNEP and other international and national bodies. The eventual aim would be for the IWC Scientific Committee work to be able to identify key habitat problem areas for cetacean conservation, potentially recommend remedial actions, and be in a position to know to whom we should address these recommendations.

It may be some time before the new Conservation Committee is fully functional, and in the meantime we feel that the work of the Environmental Concerns Working Group should continue to develop. The University of Sienna in Italy has expressed an interest in providing a cost-effective venue and facilitation for the workshop. The budget required is outlined below – this is a revised version of the budget found in the Journal of Cetacean Research and Management and is based on the participation of 25 scientists.

Cost for University of Sienna to host workshop, including secretarial support, room and board for 25 participants	£5,000
Flights for invited 25 participants	£20,000
Contingency	£3,000
Total	**£28,000**

Commissioners are reminded of Resolution 1999-5, which requests "Contracting Governments, other governments, international organizations and other bodies to contribute financially and in kind" to research programmes.

A number of non-governmental organisations have committed a total of £17,000 to the workshop.

We strongly urge Commissioners to support this initiative by providing the required additional funds via the Environmental Research Fund and via direct financial and in-kind contributions from their governments.

ANNEX b

Revised Proposal for an Intersessional Workshop on Cetacean Habitat Degradation

Simmonds M., Reijnders, Stachowitsch, Rose, Perry and others

This is further developed from proposals made by members of the Scientific Committee at the 1999 and 2000 meetings. As recommended by the 2000 meeting of the Scientific Committee, a special Scoping Group for the workshop met in June 2001 in Rome (the full report of this meeting can be found in Scientific Committee paper IWC 53/SC/E16).

1. Background

The IWC Scientific Committee has identified eight environmental priority topics: climate/environment change; physical and biological habitat degradation; chemical pollution, direct and indirect effects of fisheries; impact of noise; disease and mortality events; ozone and UV-B radiation; and Arctic issues.

The Scientific Committee has progressed its consideration of these topics by annual review of relevant scientific information by its Standing Working Group on Environmental Concerns; it organised two special workshops (one on chemical pollution in 1995 and the other on climate change in 1997) and initiated and promoted a dedicated programme of research to evaluate further the significance of chemical pollutants for cetaceans.

In Resolution 1998-5, the Commission commended the Scientific Committee for the identification of (1) physical and biological habitat degradation; and (2) Arctic issues as next priorities (IWC, 1999, p.40), and directed the Scientific Committee to continue to produce proposals for "non-lethal research to identify and evaluate the impacts of environmental changes on cetaceans in all priority areas."

In Resolution 2000-7, the Commission reiterated its strong support for investigations on the impact of environmental change on cetaceans and endorsed the further development of an IWC workshop on habitat degradation (IWC, 2000, p57).

A practical way to address a significant part of the outstanding agenda is an intersessional workshop. This workshop would be intended to help identify and develop methodologies to investigate the significance of the degradation of the critical habitat of cetacean populations caused by environmental changes. The workshop would thus help to progress the scientific evaluation of the wide range of environmental threats to cetaceans.

2. Workshop Objectives

1) To determine and help develop a framework and methodology to assess the significance for cetaceans of changes in their habitats; and
2) To facilitate the eventual development of a research plan for the evaluation and quantification of cetacean habitat degradation in specific case studies.

3. Outline of Workshop

An outline for the agenda of the workshop is appended.

The workshop would focus on the following points:

1) review and aid development of the concept of a habitat quality index to be used in classifying quality/functioning of marine ecosystems in biological and physical terms;
2) review and aid development of the concept of cetacean critical habitat and the development of quantifiable indices that may be applied to it; including assessment of marine mammal health;
3) develop the concept of cetacean habitat quality indices based on information from 2 and 3 above;
4) review and aid development of modelling approaches as part of a framework and methodology to assess the significance of changes in such measurable parameters, with a view to developing a strategy for:
   (a) monitoring critical habitat quality;
   (b) identifying thresholds which may affect cetaceans; and
   (c) assessing proposals for activities that might affect cetacean habitat.
5) review relevant available information on:
   (a) cetaceans and their habitats and, in particular, studies that allow comparisons to be made between segments of populations that appear to be responding to different levels of environmental stress; and
   (b) studies of major perturbations of cetaceans habitat.

Information of two kinds were identified as potentially of particular importance to the workshop:

1. habitat quality assessment and the use of habitat quality indices. The significance of these indices may be determined for marine mammals by comparing them with "vital parameters" (i.e. population demographics – see figure IWC53/SC/E15: figure 1): and

2. demographics – i.e. consideration of populations where there is an indication in measured population parameters of environmental disruption.

The workshop would be tasked to consider the appropriate "links" – i.e. between environmental changes and changes at the population level. For example, as suggested by the Scoping Group: A. Impact to Habitat; B. Habitat to condition/health of animal; C. Cetacean condition/health to "vital life parameters"; D. Life history to population stability; E. population persistence to community composition. The Scoping Group also recommended that particular consideration should be given to link B and an approach using comparative multivariate analyses. In this approach, several geographically distinct stocks of a species are identified for which good demographic and habitat data are available or readily obtainable. Habitat elements that vary among these sites sufficiently (and which are sufficiently independent of variations in other elements) are selected for multivariate analysis. It may be desirable to create a habitat quality index using principal components that summarise statistically significant variation among sites in the set of habitat elements; including *inter alia* prey abundance/variance, pollutant levels, noise levels, fishing intensity, temperature and salinity.

4. Steering Group: A steering group is proposed of Notarbartolo di Sciara, Simmonds, Reijnders, Rose, Reilly,

5. Draft budget (based on a three day workshop of approximately 25 people)

Some figures are bracketed to indicate that these organisational costs can be met thanks to sponsorship by ICRAM.

Venue hire	(£1,000)
Administration	£1,500)
Stationery	(£2,000)
Invited Participants	£30,000
Publication of proceedings	£3,000
Secretarial support	(£1,000)
Contingency	£1,000
Total budget	£39,500
Revised budget	31,000

DRAFT AGENDA FOR HABITAT DEGRADATION WORKSHOP

DAY 1

1.1 Introductions
Terms of Reference

- IWC instructions/considerations
- Scoping Group Report

1.2 Keystone Presentations

1.2.1 Developing a conceptual framework for quantification of factors

- Introduction to marine habitat changes/understanding "cetacean critical habitat"/vulnerabilities/assessments (setting the scene)/weighing cetacean habitat properties
- Introduction to the concept of marine habitat quality indices
- Marine mammal health indices
- Species/Population case studies (e.g. bottlenose dolphins/orcas/*Sousa*/belugas)
- Report back from "Pollution 2000+"/SOWER.

1.2.2 Methodological considerations

- Overview of collection of demographic data and environmental data
- Overview of modelling approaches

1.3 Review of submitted literature

1.4 Establishment of working groups

A. Modelling	B. Habitat Quality Assessment	C. Cetacean Population and Health Data	
- how to relate habitat properties to cetacean demographics. (see figure 1 and associated discussion)	- identification of habitat quality indices. - determining the applicability of habitat quality indices - relevance of existing (non-cetacean) information (e.g. pollution in mussels).	- review of current data collection methods. - critical review of methods compared to modelling requirements.	-review of health indicators - consideration of their application -relationship to other indicators

DAY 2

1.5 Groups Meet
1.6 Discussion between groups
1.7 Groups report back to plenary.
1.8 Working through an example

DAY 3

1.8 Future Work

- what else do we need to know?
- where shall we focus?

2.0 Review of minutes/conclusions

3.0 End of Meeting

Expertise sought

Marine Ecologists/biologists
Cetacean biologists
Oceanographers
Ecological modellers
Environmental experts – including pollution experts
Pathologists
Integrators/facilitators to head working groups.

ANNEX XI

CONSERVATION PLAN FOR CETACEANS IN THE BLACK SEA

GEF medium-sized project concept paper

<table>
<tr><td>1. Project name:

Black Sea contaminant assessment and biodiversity conservation using cetaceans as key species</td><td>2. Proposed GEF implementing Agency:

United Nations Environment Program (UNEP)</td></tr>
<tr><td>3. Country or countries in which the project is being implemented:

Regional Europe: Bulgaria, Georgia, Romania, Russia, Turkey and Ukraine</td><td>4. Country eligibility:

Bulgaria ratified CBD on 17 April 1996;
Georgia was accessed to CBD on 6 June 1994;
Romania ratified CBD on 17 August 1994;
Russia ratified CBD on 5 April 1995;
Turkey ratified CBD on 14 February 1997;
<u>Ukraine ratified CBD on 7 February 1995</u></td></tr>
<tr><td>5. GEF focal area(s):

International Waters,
Multifocal Area,
Persistent Organic Pollutants,
Biodiversity</td><td>6. Operational program/Short-term measure:

This proposal would fall within the OP10 Contaminant-Based Operational Program, OP12 Integrated Ecosystem Management and OP14 Operational Program for Reducing and Eliminating Releases of Persistent Organic Pollutants, with relevance to OP2 Coastal, Marine and Freshwater Ecosystems.</td></tr>
</table>

7. Project linkage to national priorities, action plans, and programs:

The proposal is produced in conformity with outcomes of the preceding GEF Black Sea Environmental Programme (BSEP) which resulted in the development of the Strategic Action Plan for the Rehabilitation and Protection of the Black Sea (BSSAP). The plan was adopted by all riparian countries in 1996. The plan specifically emphasizes on the necessity of concerted basin wide activities for the reduction of pollution (BSSAP, Section III.A), including the elimination of discharges (§35) and the assessment/monitoring of contaminants (§§53-56) with special interest on the regional exposure and effects of stable pollutants of global significance, more in particular the group of Persistent Organic Pollutants (POPs). Major problems on a regional scale are: what are the existing stocks of PCBs – included small and large scale industrial use – and organochlorine (OC) pesticides, and how are they being controlled and managed for final destruction.

Many POPs are listed for possible carcinogenic, teratogenic, endocrine disruptive and immunosuppressive effects. High trophic level marine mammals are exposed to particularly high daily doses of PCBs and OC pesticide residues, to a lesser extent to dioxins and to polyaromatic hydrocarbons (PAHs); the latter two being less environmentally stable and therefore more important with regard to point sources. This proposal has a direct linkage to the implementation of National Strategies for the Conservation of Biological Diversity which have been approved by the governments of the Black Sea countries. Furthermore, §62 of BSSAP represents the list of priority measures, which are necessary for the protection of Black Sea biological diversity by means of assessment, conservation and restoration of marine mammal populations. All three species of Black Sea cetaceans – harbour porpoise (Phocoena phocoena), bottlenose dolphin (Tursiops truncatus) and common dolphin (Delphinus delphis) – and their habitats are protected by the Bonn Convention, CITES, Bern Convention, Bucharest Convention, and by the Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and the contiguous Atlantic area (ACCOBAMS).

These populations are listed in the IUCN Red Data List (2002) and are included in the IUCN/SSC 2002-2010 Conservation Action Plan for the World's Cetaceans (2003). They are equally included in the IUCN Red Data Book on Cetaceans (1991), the Black Sea Regional Red Data Book (1999) and the National Red Data Books of Bulgaria, Georgia, Russia and Ukraine. They are also mentioned in the EC Directive No.92/43/EEC on the conservation of natural habitats of wild fauna and flora[a]: common dolphin is listed in Annex IV "Animal and plant species of Community interest in need of strict protection", harbour porpoise and bottlenose dolphin in Annex II, implying that special protected areas have to be created. This proposal has links to other national initiatives, such as: the EC/LIFE-Nature project "Conservation of dolphins from the Romanian Black Sea waters" (2001-2004); the National Program of Ukraine for the Conservation and Rehabilitation of the Azov and Black Seas (2001-2010; approved by the Parliament of Ukraine in March 2001)[b]; and the Program for the Research, Protection and Rehabilitation of Marine Mammals of the Black and Azov Seas (asserted by the Ministry of Environment and Natural Resources of Ukraine in August 1999). The draft National Action Plan for the Conservation of Black/Azov Sea Cetaceans was considered and adopted in Ukraine by national workshop held in Kiev on March 31th, 2001.

8. Status of national operational focal point review (dates):

	Submitted:	Acknowledged:	Endorsed:
Bulgaria			
Georgia			
Romania			
Russia			
Turkey			
Ukraine			

9. Project rationale and objectives:

The Black Sea is characterised by very specific oceanographic patterns, which are dominated by a large anoxic deep water mass. The major water supply is from large river basins, including the Danube, Dnieper and Don. Little exchange of water takes place with the Mediterranean basin. The unbalanced industrialisation, urbanisation, land improvement and extensive agriculture in most of the bordering countries pose a continuous pollution threat to the Black Sea ecosystem. The Danube and other river basins carry large amounts of stable pollutants to the Black Sea; stocks of pollutants are not always properly managed and the industrial, agricultural and municipal emission of pollutants in the air and river compartments are not always regarded as priority problems. And, the emissions into the air compartment are to be seen as a larger pan-European problem. Wars in former Yugoslavia, combined with the deliberate destruction industry, probably have contaminated the area with industrially used POPs. In addition, large scale accidental releases of pollutants, e.g., in Romania and the former USSR-countries only add to the regional problems. Being a semi-enclosed ecosystem, the Black Sea is particularly vulnerable to pollution impact. Signs of habitat and biodiversity degradation are showing, the outbreak of morbilliviral infectious disease in Black Sea cetaceans being another possible indicator for POPs exposure.

All POPs share physicochemical properties, e.g., high log Kow values, indicating a high affinity for lipids, they are relativly stable, and thus will bioaccumulate and biomagnify PCBs are still widely used in industrial older transformer (most probably >90%) and condensator systems, hydraulic equipment and heat transfer systems. All of these systems are closed systems, implying that no losses are to be expected when still in use. Final disposal of PCB-containing oils is, however, expensive, time consuming and requires governmental control. Recent examples in Western Europe indicate that large amounts of PCBs or PCB containing equipment are readily dumped, and that the official policy for PCB management and disposal is not able to prevent accidental or deliberate dumping. Given the high costs linked with PCB removal and incineration, it is likely to expect that the environmental contamination of PCBs will be as hard to control by the Black Sea countries as they are in the Western part of Europe.

Overall figures of PCB containing equipment of PCB stocks and streams in the Black Sea region are not available. The smaller 'open system' use of PCBs in dilution oils, lubricators, mastics and paints, colorants and inks, is not worse in the Black Sea region than it is in the rest of Europe. On top of this, it is y unclear to which extent POPs pesticides are still being used in the region, or to which extent and how existing stocks are controlled and managed. Particularly high concentrations of DDTs in marine mammal tissues indicate that organochlorine pesticides be of particular importance for the Black Sea region.

In the longer term, marine systems will be the final target for the POPs; together with heavy metals that reach the Black Sea basin, top predators will act as final targets for most of the pollutant stress. Black Sea cetacean diets consist almost entirely of fish, which have high POP and heavy metal contents. Extreme exposure to POPs and heavy metals mayseverely impair marine mammal immune system functioning, as well as endocrine disruption, and teratogenic effects, as shown by earlier and well documented PCB-related incidents. It is, however, unclear to which extent POP and heavy metal exposure is a major factor, threatening Black Sea cetaceans, compared to other factors such as overall habitat degradation, fishery by-catch, crude oil pollution or regional overfishing. However, so far, only few reports, most of them consisting of isolated and sometimes contradictory and disputable facts, have focused on these problems. Few systematic studies have been performed on persistent organic pollutant and heavy metal emission to the Black Sea, nor on the pollutant stress caused to cetacean populations. Black Sea habitat degradation due to various human activities and its relationship to marine mammal predation, population size and fishery yields has equally been poorly studied.

Cetaceans crown the Black Sea ecosystem as the top predators. The populations are subjected to various factors of stress due to human activities. In the past, the more important factor involved in the depletion of cetacean numbers was commercial killing, stopped in 1983, i.e. 20 years ago. Currently, indirect factors such as land-based or airborne pollution and habitat degradation, leading to reduction of food resources, reproductive stress and disease, possibly enhancing the outbreak of epizootics are the more recent threats affecting local cetacean populations. On top of this, daily interactions with fishing activities remains a cause for accidental mortality of cetaceans, the number of which is not well known. Cetaceans must be regarded as significant bio-indicators for pollution control and as prognosticators for public health. Considering the fact that cetaceans are migratory species and do not know state borders, only an international transboundary effort will be suitable to accomplish the envisioned goals, which are:

(1) to identify the sources and fluxes of POPs and heavy metals in the Black Sea region;

(2) to investigate POP and heavy metal stress in cetaceans, in particular immunotoxic and endocrine disrupting effects;

(3) to gain knowledge about cetacean genetic biodiversity, reproduction, seasonal or non-seasonal migratory movements, diet, pathology and epidemiology of infectious diseases causing mass mortality events;

(4) survey of the population; to assess abundance and distribution of cetaceans in the territorial waters of Black Sea states and international maritime area, as well as the impact of increasing maritime traffic;

(5) to investigate the mutual interaction between cetaceans, fisheries and aquaculture;

(6) to identify critical habitats for cetaceans and identification for indicators for habitat degradation;

(7) to establish and improve the cetacean stranding and by-catch monitoring network system;

(8) to establish a Black Sea Cetaceans Geographical Information System (GIS) which includes database systems on cetacean surveys, sightings (incl. photo-identification), strandings, by-catches, habitats and bibliographical data on Black Sea cetaceans;

(9) integration of results into a conservation plan for Black Sea cetaceans with special reference to major stress factors, critical habitat zones and special marine protected areas.

The above objectives of the project satisfy the requirements stated in the BSSAP (1996), ACCOBAMS Conservation Plan (1996) and ACCOBAMS MOP1 resolution 1.9 (International Implementation Priorities for 2002-2006; actions 2, 3, 4, 6, 11, 12, 13, 14, 15, 16, 17, 18). The 1st and 2nd goals of this project fully correspond to the targeted research areas recommended by STAP Brainstorming on POPs (2000).

10. Expected outcomes:

Identification of fluxes and transport of POPs and heavy metals towards the Black Sea ecosystem;

linkage to existing data sets on Black Sea pollutant levels. Assessment of national and regional planning for POPs, in particular PCB stock control and disposal. Assessment of the possible impact on marine mammal populations as indicators species. Basin-wide data on cetacean abundance, distribution, genetics, life history, nutrition, pollutant fluxes and related stress, immunotoxic and endocrine disrupting effects and pathology will provide the detailed insight that will provide the basis for development and implementation of a conservation plan for Black Sea cetaceans and their habitats. A standardised methodology and a network for monitoring cetacean populations will be set up in all Black Sea countries. Pollution fluxes and stress on cetacean populations, with special reference to POP-related immunological and endocrine disorders, will be assessed. The project aims to identify critical habitats for cetacean reproduction, feeding and migrations, and to evaluate the degree of habitat degradation on a local and region-based scale. Human-cetacean interactions will be monitored; balanced actions will be proposed for both the economical and ecological needs of humans and cetaceans, respectively. In particular, the project will yield information on the importance of fishing activities as a potential cause of decline of cetacean populations. At the same time, the data about damage caused by marine mammals to fisheries will be assessed. A Black Sea Cetaceans Geographical Information System (GIS), part of the ACCOBAMS networking, will be established by means of digital technologies to collect and analyse previous, current and future data on cetacean biology, ecology and pathology. The results of the proposed project will be used to outline future strategies to develop social-economically and ecologically necessary guidelines to respect requirements for human activities in the Black Sea. The results will contribute significantly to fundamental and applied science and will provide the basis to formulate scientifically sound recommendations for the restoration of Black Sea biodiversity and sustainable use of its biological resources. A proposal will be delineated on the feasibility of a network of Black Sea marine protected areas for cetacean conservation, and appropriate recommendations with special emphasis to cetacean reproduction areas will be outlined to follow ACCOBAMS implementation.The results of the project will be used to improve national legislation in the Black Sea states as well as regional (international) legal instruments dedicated to regulate conservation activities, sustainable use and management of the marine environment and natural resources.

11. Planned activities to achieve outcomes:

Within 4 years this multidisciplinary and multinational project will include:

(a) identification of POP and heavy metal fluxes in the Black Sea region; establishment of a regional data base, using existing regional and national data sets on fluxes and transport of POPs and heavy metals towards the Black Sea; identification of hot spots;

(b) training of specialists and volunteers on methods for data/samples collection and evaluation of the status of cetacean populations and their habitats;

(c) development of already established national cetacean monitoring networks and their transformation into a basin-wide network;

(d) assessment of pollutant stress, with special attention to POP-related immunological and endocrine stress;

(e) postmortem investigation of accidentally caught or stranded cetaceans with subsequent laboratory analysis of their biological (genetics, reproduction, nutrition) and pathological (microbiology, parasitology, histopathology) features;

(f) population studies on the waters and coasts of all six riparian countries including aerial and boat surveys, photo-identification, and the monitoring of cetacean strandings and by-catches;

(g) identification of critical habitats and possible causes of habitat degradation;

(h) on-board observations of the fishing activities, paralleled by records of cetacean by-catches and fish catches;

(i) evaluation of cetacean and fisheries mutual impact, including damage to gear, reduction of the amount and value of the catch, etc.;

(j) the obtained results, incorporated into specially designed GIS, will be used to elaborate recommendations in form of the Conservation Plan (including emergency aspects) which will respect economical and ecological requirements for the benefit of marine mammals and human activities and will also include public health aspects;

(k) designing of a network of Black Sea marine protected areas (sanctuaries) for cetacean

conservation; (l) Black Sea Cetaceans web-site, as a tool to share information, will be designed and supported to enhance capacity of basin-wide cetacean network by means of Black Sea NGOs, and to raise public awareness and public participation in the implementation of this project.
12. Stakeholders involved in project: The proposed activities will be performed by expectedly 8 teams from different countries including all 6 riparian Black Sea countries. Other institutes might be included as subcontractors in this project. Following 8 institutes will form the "core" group for executing the proposed activities [c]: Bulgaria – Institute of Fishing Resources and Fisheries, Varna (liable for project implementation in Bulgaria) Georgia – Institute of Marine Ecology and Fisheries, Batumi (liable for project implementation in Georgia) Romania – G. Antipa National Institute for Marine Research and Development, Constantza (liable for project implementation in Romania) Russia – A.N. Severtsov Institute of Ecology and Evolution, Moscow (liable for project implementation in the Russian Federation) Turkey – Faculty of Fisheries, Istanbul University (liable for project implementation in Turkey) **Ukraine – Brema Laboratory, Simferopol (liable for project implementation in Ukraine; histopathological, microbiological and parasitological investigations)** Belgium – Laboratory for Ecotoxicology, Free University of Brussels (toxicological investigations) Germany – Institut für Pathologie der Tierärztlichen Hochschule Hannover (genetic and immuno-histopathological investigations).
13. Information on project proposer: The ACCOBAMS Permanent Secretariat (Monaco) proposed this project in accordance with appropriate recommendation of the 1st Meeting of the Parties (Monaco, 28 February-2 March 2002).
14. Information on proposed executing agency (if different from above): The Black Sea Commission (Istanbul), designated as the ACCOBAMS Sub-regional Co-ordination Unit for the Black Sea (see MOP1 resolution 1.5), will execute the project through the general management of stakeholders activities. With the help of a Block A PDF, the Black Sea Commission will conduct the initial workshop of stakeholders and consultants for project development.
15. Estimated budget (in US$ or local currency): **GEF**: approx $1.000.000 **Co-financing**: not less than $1.000.000 (incl. in-kind contributions) [d] **TOTAL**: not less than $2.000.000

[a]Bulgaria and Romania are the states in the phase of pre-accession to the European Union
[b]Similar national programs on the conservation of the Black Sea were drafted in Bulgaria, Georgia, Romania and Turkey. Measures for the protection and rehabilitation of the Black/Azov Seas are envisaged also in the Russian Federation as a part of federal program on nature conservation
[c] Five from mentioned eight institutions already have positive experience how to work together within EC/INCO-Copernicus BLASDOL-project (1997-1999; ERBIC15CT960104). They are the teams from Belgium, Bulgaria, Georgia, Germany, and Ukraine. Representatives from Belgium, Germany and Ukraine have drafted this Project Concept Paper
[d] GEF expects a high degree of co-financing of medium-sized projects. Thus, co-financing contributions from all Black Sea countries and other donors are predicted. For instance, the budget of running Romanian LIFE-Nature project – about 417.000 Euro – can be considered as a contribution from the European Commission and Romania. Some actions are foreseen in the ACCOBAMS program/budget 2002-2004.

ANNEX XII

CONSERVATION PLAN FOR CETACEANS IN THE BLACK SEA

Towards a Conservation Plan for Black Sea Cetaceans

Alexei Birkun[1], Giovanni Bearzi[2], Dmitriy Glazov[3], Irakli Goradze[4], George Komakhidze[4],
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INTRODUCTION

1. The strategy for cetacean research and conservation actions presented here has been developed following a request by ACCOBAMS, that encouraged one of the authors (A. Birkun) to proceed with the development of a Black Sea conservation and management plan, according to the Implementation Priority #6 (ACCOBAMS, 2002). Such management plan is intended to complement the existing Implementation Priorities addressing cetacean research and conservation in the Black Sea.

2. This document was prepared during the first training course on cetacean photo-identification sponsored by ACCOBAMS, that was held in July 2003 at the Tethys Research Institute field station in Kalamos, Greece. The course provided opportunities to discuss the most appropriate actions and prioritize them based on input provided by researchers from Ukraine, Russia and Georgia. All participants agreed about the general strategy and committed to support the actions outlined in this document. Representatives from three other Black Sea countries (Turkey, Romania and Bulgaria) did not participate in the photo-id training course and as a consequence they could not participate in this effort. Therefore, they are encouraged to provide input and ideas to further complement and improve the present contribution to a Conservation Plan for Black Sea cetaceans.

3. Although an attempt was made to design a common strategy for all Black Sea countries, differences backgrounds and logistical constraints, ultimately affected the design of uniform strategies and resulted in different approaches and recommendations.

4. Recommendations made by the IWC Subcommittee on Small Cetaceans (IWC, in press) were adopted by this document and partly incorporated in the strategy presented here. The proposed priority actions were identified in addition to or based on the recommendations by the ACCOBAMS Scientific Committee (Tunis, 2002), as well as in accordance with the IUCN/SSC 2002-2010 Conservation Action Plan for the World¢s Cetaceans (Reeves *et al*., 2003).

RECOMMENDATIONS

We recommend that a common mechanism to promote cetacean research, conservation actions and capacity building be promoted by ACCOBAMS and adopted by all Black Sea countries, with the aim of facilitating cross-country collaboration while taking into account regional differences.

We recommend that a Conservation Plan for cetaceans (CPC) in the Black Sea region be created based on a strategy designed by ACCOBAMS. The implementation of such a CPC should coordinated by ACCOBAMS and BSC. Although the final CPC may result from a series of regional Action Plans developed independently by each Black Sea country, collaborative efforts and management actions should be strongly encouraged. For instance, Ukraine, Russia and Georgia may develop a joint CPC based on the hypothesis that cetaceans move across the coastline of these countries. Such an hypothesis remains to be confirmed by the ongoing photo-identification studies.

We recommend that a link with the Black Sea Environment Biodiversity Monitoring Programme be established.

EC Agencies such as INCO-Copernicus, INTAS and TACIS may support scientific research and collaboration between Western European and the former USSR countries (i.e. the so called NIS countries, including Georgia, Russia and Ukraine). We recommend that links be created between ACCOBAMS and these agencies to explore possibilities to fund collaborative projects centred around cetacean research and conservation.

A Management Plan for cetaceans is expected to be developed by Romania based on the financial support provided by a recent LIFE-NATURE project. We recommend that such plan be reviewed by ACCOBAMS experts and implemented where appropriate with support from ACCOBAMS. The existing possibilities for cross-country collaboration should be facilitated.

Finally, we recommend that Turkey, Romania and Bulgaria be requested to provide further input and comments to complement and improve the present document.

PROPOSED ACTIONS

The 10 Actions proposed below have been divided into four broader categories: Management, Capacity building, Education & Awareness, and Research & Monitoring. We would like to stress that all categories are equally important and they will have to be addressed simultaneously.

1. MANAGEMENT

ACTION 1.1.
MITIGATION OF BYCATCH

Aim: Reduction of the currently very high numbers of harbour porpoises being caught annually in fishing gear.

Background: Bycatch of harbour porpoises in fishing gear has been recognized as one of the most dramatic threats affecting cetaceans in the Black Sea.

Recommendations: Link with group working on Fisheries Convention in the Black Sea (Fisheries Advisory Group of the Black Sea Commission) to develop an Action Plan dedicated to mitigation of bycatch of harbour porpoises.

2. CAPACITY BUILDING

ACTION 2.1.
LONG-TERM CAPACITY BUILDING

Aim: Capitalize on existing expertise. Creating a framework supporting the development of a long-term
capacity building strategy in the Black Sea sub-region.

Background: Very few young scientists and students are involved in cetacean research and conservation activities in the Black Sea countries. No special course (or any other particular form of education) on cetacean research and management exists in national Universities. At the same time there are 3 institutions, teams and specialists who can provide interested young people with basic knowledge on cetology and practical skills on field and laboratory work on Black Sea cetaceans.

Recommendations: We recommend that ACCOBAMS supports the creation of a inter-university course on cetacean research and management, which may be organized, for instance, at the Crimean State Medical University / Tauria National University, both situated in Simferopol, Ukraine, with a basic assistance from the Brema Laboratory (Simferopol), a non-governmental body recognized as ACCOBAMS Partner by MOP1 (Monaco, 2002).

Such a cetacean research and management course would offer a possible link with the Sevastopol (Ukraine) branch of the Lomonosov State University of Moscow (Russia) University, resulting in facilitated access for Russian students. The course would be the first of its kind in Black Sea countries, and would provide Black Sea students interested in cetaceans with a possibility to get expert advise and supervision.

Specialists involved in the functioning of such a course could supervise the work of PhD students conducting field research in the Black Sea sub-region, which would result in increased expertise and knowledge on local cetaceans.

EU projects such as “Tempus”, which is including the Tauria National University and the Lomonosov State University of Moscow, may facilitate the participation of international cetacean experts to the course
taught at Simferopol.

Although being particularly aimed to Russian-speaking students (i.e., to students from Georgia, Russia, and Ukraine) who can attend the University courses at Simferopol, the course should be open to students from all Black Sea countries ACCOBAMS may help supporting the interested students by developing an appropriate selection mechanism that gives access to a system of grants. We recommend that one grant is made available annually for a PhD student from a Black Sea country.

In addition, interested students from Black Sea countries may be provided with grants (e.g. one grant per year) to allow their participation in short-term courses on cetacean research and conservation (e.g. the course on marine mammals organized by the University of Valencia, the distance sampling workshop organized by the University of St. Andrews, the field training courses on cetacean research techniques organized by the Tethys Research Institute etc.) and to gain practical field experience with cetaceans.

ACTION 2.2.
PROVISION OF EXPERT SUPERVISION

Aim: Providing Black Sea researchers and students with follow-up and expert supervision to facilitate scientific data analysis on cetaceans.

Background: Some researchers and postgraduate students have accumulated sizeable datasets containing various field and laboratory data on Black Sea cetaceans. Those data are in need of accurate treatment and analysis including modern approaches in applied mathematics and mathematical modelling. However, expertise is needed to perform such analyses, which should be made available to the concerned researchers.
Recommendations: We recommend that ACCOBAMS provides support to one Black Sea person/year for visiting a European laboratory to get expert supervision, consult the scientific literature, perform

data analysis and draft papers on Black Sea cetaceans. An appropriate mechanism should be put in place to select the most worthy applicants.

3. EDUCATION & AWARENESS

ACTION 3.1.
ACCESS TO INFORMATION

Aim: To give access to the general public, mass media, decision makers and potential sponsors to the results of cetacean research and conservation activities carried out in the Black Sea region. To increase the transparency of any interactions between research teams, NGOs and governmental bodies in Black Sea countries.

Background: Cetacean research and conservation activities are on the rise in some Black Sea countries, and a series of meaningful projects have been realized during the past decade (IWC, in press). Nevertheless, information about those activities as well as on the present state and threats to Black Sea cetacean populations is mainly or exclusively accessible for cetacean specialists, leaving aside many other concerned people. Ukrainian researchers started to facilitate access to information by means of a web site (www.dolphin.com.ua) and of a CD ROM on Black Sea cetaceans that includes the description of 20 projects conducted by the Brema Laboratory and its partners since August 1999. However, such information and tools are available for Russian–speaking users only.

Recommendations: We recommend that ACCOBAMS provides support to develop web sites dedicated to Black Sea cetaceans and to research and conservation activities in each Black Sea country, and encourage the development of networks and collaborations. These web sites should be bilingual, using national and English languages.

ACTION 3.2.
CETACEAN LIBRARIES / DOCUMENTATION CENTRES

Aims: Provision of appropriate documentation to Black Sea researchers, particularly as far as access to scientific literature on cetaceans is concerned (see ACCOBAMS Implementation Priorities #12 and 16).

Background: Representatives from several Black Sea countries have repeatedly and consistently stressed that access to the cetacean scientific literature is difficult in their countries. This prevents to obtain appropriate documentation, learn from the work done by others and publish in scientific journals.
Recommendations: We recommend that links be developed between comprehensive collections of marine mammal literature and Black Sea libraries and/or individual researchers. Exchange of literature should be facilitated by all means by providing selected libraries with the necessary support to operate as a source of continuously updated information for Black Sea researchers. This may result in the creation of core cetacean libraries in Black Sea countries which, in turn, may serve as sources for local scientists and interested students.

We further recommend that the proposal made by the Brema Laboratory to the ACCOBAMS Scientific Committee for the funding of a digital library on Black Sea cetaceans be (re)considered, and that exchange of information and literature among Black Sea libraries be facilitated and supported.

4. RESEARCH & MONITORING

ACTION 4.1.
BASIC CETACEAN SURVEYS / IDENTIFICATION OF CETACEAN HOT SPOTS

Aim: Promotion of research and conservation activities in the recognized areas of high importance for the conservation of Black Sea cetaceans (e.g. see ACCOBAMS Implementation Priority #4).
Background: Aerial surveys in the Kerch Strait, Azov Sea and northeastern shelf area of the Black Sea have been conducted by a joint Ukrainian/Russian team in 2001 and 2002. The procedures and results obtained from these surveys were commended by the IWC Subcommittee on Small Cetaceans (IWC, in press).

Recommendations: We recommend that hot spots of cetacean occurrence in the Black Sea are identified, particularly by means of line transect aerial and boat surveys, where photo-identification projects can be conducted.
This would result in the creation of photo-identification catalogues for Black Sea dolphins (primarily common bottlenose dolphins; see Action 4.4) that may trigger cross-country collaboration among Black Sea institutes, promote cetacean research and increase knowledge on dolphin movements and habitat use.
It is recommended that support be provided to the Institute of Fisheries and Aquaculture in Varna, Bulgaria, to design and perform preliminary cetacean surveys in the area. Preliminary support has been provided by the Tethys Research Institute in the context of a cetacean training course sponsored by ACCOBAMS and attended by Dr. Konstantin Mikhailov. This should be followed by the provision of expert support, and by capacity building initiatives aimed at creating expertise in Bulgaria.

ACTION 4.2.
RESEARCH AND CONSERVATION ACTIONS IN THE BLACK SEA "GATES"

Aim: Promotion of research in the Turkish Straits System and in the Kerch Strait, with special regard to population discreteness and movements across the Azov, Black and Mediterranean Seas (also see IWC, in
press); promotion of data publishing for these areas with the aim of informing the scientific community at large.

Background: The Turkish Straits System and the Kerch Strait represent two natural gates or corridors connecting the Black Sea with the Mediterranean and Azov Seas. Both channels are recognized as the most important migratory paths and they are known to represent critical habitats for Black Sea dolphins and porpoises (IWC, in press). Cetacean sighting surveys in the Turkish Straits System and in the Kerch Strait have been recently conducted by researchers from Turkey and by a joint Ukrainian/Russian team.

Recommendations: Results from the field work conducted so far should be made available to the wider scientific community and used to design future research strategies.

A Conservation Plan for dolphins living in the Turkish Straits System may be commissioned to specialists working with the Istanbul University with reference to the recommendation made in the IWC Berlin document (IWC, in press).
Similarly, a Conservation Plan for dolphins living in the Kerch Strait may be prepared by Ukrainian and Russian scientists provided with supervision by authoritative experts.

ACTION 4.3.
RESEARCH IN CETACEAN WINTERING AREAS

Aim: Developing research projects and collaborations aimed at increasing information on cetacean wintering areas in the Black Sea.

Background: Field studies of Black Sea cetaceans have been carried out mainly during the warm season, from May to October. Consequently, very little is known about cetacean distribution and ecology in the cold season. Previous authors (e.g. Kleinenberg, 1956) suggested that biologically important winter aggregations of dolphins and porpoises occurred regularly in portions of the Crimean, Caucasian and Anatolian coasts. In particular, it has been speculated that the area of Poti-Batumi, in Georgia, and the adjacent Turkish waters may represent annual wintering areas for cetaceans, which use those waters as seasonal foraging grounds. However, no dedicated research has been conducted so far to test this hypothesis. The same areas are known to represent key wintering areas for anchovies (Black Sea geographic information system, 1997).

Recommendations: We recommend that collaboration between the Georgian Institute of Marine Ecology and Fisheries in Batumi and the Black Sea Technical University in Trabzon, Turkey, be improved to study the existing cetacean wintering areas in the south-eastern Black Sea.

ACTION 4.4.
PROMOTION AND ADOPTION OF CETACEAN PHOTO-IDENTIFICATION TECHNIQUES

Aim: Promotion of cetacean photo-identification techniques in all Black Sea countries (ACCOBAMS Implementation Priority #11).

Background: A training course on photo-identification methods was organized by ACCOBAMS in July 2003 for Black Sea researchers including representatives from Ukraine, Russia and Georgia. The course was then complemented by a follow-up in Balaklava, Ukraine, in October 2003.

Recommendations: We recommend that the existing links with the Europhlukes programme (www.europhlukes.net) be enforced to promote photo-identification studies in the Black Sea sub-region.

A project similar to Europhlukes could be specifically in Black Sea countries to promote the creation of Black Sea catalogues, following a comprehensive series of capacity building activities, follow up and expert supervision.

A collaborative project was started by Russia and Ukraine in 2003, and may have Georgia joining in 2004. Dorsal fin catalogues of common bottlenose dolphins identified in these three countries may be shared and published online on a dedicated web site. Such a pilot initiative may attract interest and promote further developments.

ACTION 4.5.
START PRELIMINARY CETACEAN RESEARCH OFF THE GEORGIAN AND BULGARIAN COASTLINE

Aim: Promotion of preliminary investigations on cetaceans living in the Georgian and Bulgarian coastal waters, based on surveys and photo-identification work.

Background: In the summer 2003, researchers from Bulgaria (Konstantin Michailov) and Georgia (Irakli Goradze, George Komakhidze) have been involved in training programmes sponsored by ACCOBAMS, aimed at increasing expertise on cetacean research methods. The trainees have been provided with dedicated data collection forms and protocols (Bulgaria, Georgia) and photo-identification equipment (Georgia) to run basic cetacean studies in coastal waters.

Recommendations: We recommend that the capacity building process initiated by ACCOBAMS be implemented and that follow up be provided to support preliminary research on cetaceans off Varna, Bulgaria, and in the Kolkheti National Park, Georgia.
In Bulgaria, infrastructures and facilities exist at the Institute of Fisheries (Varna), that may help initiating the opportunistic collection of cetacean data during surveys aimed at fishery research.

In Georgia, an ongoing project exists for the establishment of the Kolkheti National Park which includes a Marine Reserve of approximately 144 km2; this project is a component of the World Bank/GEF funded Georgia Integrated Coastal Management Project GICMP. This seems to represent an ideal framework to start a cetacean study within the waters of that marine reserve. This project could be run by two Georgian researchers who attended the training course on photo-identification methods organized by ACCOBAMS, who would be willing to perform cetacean research in the region based on individual photoidentification techniques.

We further recommend that basic cetacean surveys be promoted in other poorly-known areas with the aim of identifying hot spots of cetacean occurrence. In particular, cetacean survey methods which were used successfully in Russian and Ukrainian waters (see IWC, in press) could be "exported" to other Black Sea countries.

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ANNEX 1 - RELATED ACCOBAMS IMPLEMENTATION PRIORITIES

Action # 4

Development and implementation of pilot conservation and management actions in welldefined key areas containing critical habitat for populations belonging to priority species

***(Delphinus delphis, Phocoena phocoena, Physeter macrocephalus, Tursiops truncatus*)**

In spite of the recent growth of scientific knowledge and attention on cetacean ecology in the Agreement area, and of the awareness of the survival threats these mammals are subject to, evidence is accumulating that some populations are declining in numbers and becoming increasingly fragmented within their shrinking range. Particular concern exists for short-beaked common dolphins in the Mediterranean, as well as for harbour porpoises, common bottlenose dolphins, and sperm whales. In some well-known instances, relic population units of these species are presently seen to be undergoing dramatic reductions in their numbers, and are thought likely to disappear soon if prompt measures are not taken. This action proposes to select four areas, each of them containing critical habitat for one of the four priority species, in which pilot conservation and management projects be developed and implemented immediately. Areas should be selected on the basis of sufficient available knowledge and characteristics of the area allowing the creation of a model, which can then be applied to other similar situations in the Agreement area. The following areas show particular promise as possible candidates: (a) the coastal waters surrounding the island of Kalamos, western Greece (short-beaked common dolphins); (b) the coastal area of southern Crimea, Ukraine, comprised between Cape Sarych and Cape Khersones (harbour porpoises and Black Sea common bottlenose dolphins); (c) the offshore waters of southern Crete, Greece (sperm whales); and (d) the waters of the Losinj-Cres Archipelago, Croatia (Mediterranean common bottlenose dolphins). Conservation measures should involve the establishment of *ad hoc* protected areas encompassing critical habitat for the target species and the adoption of experimental management plans with the involvement of local people and user groups; measures should include intensive monitoring of the cetacean population, targeted research, regulation of impacting human activities, education efforts directed at the local fishing communities and recreational users, and promotion of more compatible, alternative activities (e.g., whale watching) and resource uses.

Action # 6

Conservation plan for cetaceans in the Black Sea

This project envisages the co-operation between ACCOBAMS and the Black Sea Commission to prepare a proposal to be submitted to the GEF, concerning a comprehensive conservation and management plan for Black Sea cetaceans. The plan should include efforts to fill the existing knowledge gaps concerning the distribution, abundance, population structure, and factors threatening the conservation of the three species involved, as well as management measures such as the establishment of specially protected areas, the development and implementation of regulations to increase sustainability of human activities in the subregion, and the organisation of training, education and awareness initiatives.

Action # 11

Development of photo-identification databases and programmes encompassing the entire ACCOBAMS Area

Studying free-ranging cetacean populations using photo-identification techniques has become a common, powerful research practice during the past decade in many areas of the world, including portions of the Agreement area. Such studies have proven, among other things, to hold considerable conservation value.

Recently, a three-year programme, «Europhlukes», was funded by the European Commission with the goals of developing an European cetacean photo-id system as a support tool for marine research and conservation, to initiate a European network which will link providers with end-users of the European cetacean photo-id system, and to ensure future growth and maintenance of the system and its databases. Although a budget for this action could not be secured for the 2002-2004 period, it is highly recommended that an operational link be established between ACCOBAMS and the «Europhlukes» project management, to explore possibilities for future co-operative effort, for the extension of the programme to non-European partners within the Agreement Range States, and to help ensuring the indefinite continuation of this worthy initiative after the European project is terminated.

Action # 12

Establishment and implementation of a long-term training programme on cetacean research, monitoring and conservation/management techniques and procedures

Cetacean research and monitoring techniques have made considerable progress in recent decades, and provide significant support to the conservation and management effort. While such techniques are currently consistently applied, and even developed, in portions of the Agreement area, they are largely ignored elsewhere. Diffusing research and monitoring abilities throughout the region thus seems like a timely challenge and one of the highest priorities as far as cetacean conservation is concerned. The problem to be addressed is twofold: (a) transmitting knowledge through appropriate, effective and longlasting training procedures, and (b) ensuring that such hard-gained knowledge is put to good, long-term use once the trainees endeavour to apply it at home. Accordingly, this activity will firstly consist in the organisation of field-based training courses in areas providing ideal research facilities and opportunities, to teach standard research techniques and provide selected participants with a hands-on experience. Secondly, follow-up support to the selected trainees in their countries, to assist with the development and implementation of research and conservation projects, will have to be provided through a cooperative effort between the Agreement Secretariat, or the appropriate Co-ordinating Unit, and the
concerned Contracting Party.

Action # 16

Development of a network of specialised bibliographic collections and databases

One of the greatest hindrances to the region-wide development of a cetacean science tradition – a fundamental prerequisite to conservation and, ultimately, to the fulfilment of the purposes of the Agreement - is the diffused current unavailability of up-to-date specialised literature in most Range States' scientific and academic environment. This action proposes the establishment of a working group, which should include specialised librarian expertise, to examine the current availability of pertinent bibliographic material across the Agreement area, to strengthen existing facilities, and to identify locations where additional specialised libraries should be established. Support should be provided to existing libraries containing significant cetological bibliographic collections, to ensure continued updating and expansion, to facilitate access to information to the local scientific community, and to provide a framework for capacity building that will encourage documented cetacean research in the Agreement area. Modern document transfer and exchange technology should be adopted and promoted, and library databases should be managed within the context of a network that facilitates cross-library research and exchange of materials.

ANNEX XIII

CONSERVATION PLAN FOR CETACEANS IN THE BLACK SEA

Report of the Sub-Committee on Small Cetaceans

Members: Read (Chair), Al Kiyumi, Amaha Öztürk, Baker, Behel, Berggren, Birkun, Birtles, Bjørge, Borsani, Bräger, Brownell, Jr., Childerhouse, Cipriano, Deimer, Diake, Forde, Fortuna, Fossi, Funahashi, Gidding, Groch, Hammond, Haug, Iñiguez, Jeglinski, Kasuya, Kell, Kim, Kock, Komakhidze, Krahn, Krivokhizhin, Lauriano, Lawrence, Lee, Lima, Ludwig, Manzanilla, Marsili, Martin, Mikhalev, Minton, Moldoveanu, Moore, Natoli, Northridge, Olafsdottir, Öztürk, Palazzo, Palka, Pantoja, Park, Parsons, Paulus, Perrin, Perry, Rambally, Reeves, Reijnders, Reilly, Ridoux, Ritter, Rogan, Rojas-Bracho, Rose, Sadler, Senn, Simmonds, Sohn, Stachowitsch, Stanev, Suydam, Thiele, Tiedemann, Tsidulko, Urban, Urquiola, Vikingsson, Wade, Walters, Williams, Wilson.

1. ELECTION OF CHAIR

Read was elected Chair.

2. ADOPTION OF AGENDA

The adopted Agenda is given in Appendix 1.

3. APPOINTMENT OF RAPPORTEURS

Rogan and Wilson acted as rapporteurs.

4. REVIEW OF AVAILABLE DOCUMENTS

Documents relevant to the work of the sub-committee were: SC/55/1-28 and SC/55/BC1 and a report entitled "Cetaceans in the Mediterranean and Black Seas: state of knowledge and conservation strategies" prepared for the ACCOBAMS meeting of parties (Monaco, 2002)

5. REVIEW OF STATUS OF SMALL CETACEANS IN THE BLACK SEA

Three cetacean species occur in the Black Sea: the harbour porpoise (*Phocoena phocoena*), short-beaked common dolphin (*Delphinus delphis*) and common bottlenose dolphin (*Tursiops truncatus*). On several occasions in the past, the Scientific Committee has expressed concern regarding the status of small cetaceans of the Black Sea (e.g. IWC 1983; IWC 1992). This concern has arisen as a result of large directed takes in the past (Zemsky and Yablokov 1974; Smith 1982; Zemsky, 1996; Yel et al. 1996), by-catches in gill net fisheries (Pavlov et al., 1996; Tonay & Öztürk 2003; Radu et al. 2003), declines in prey populations (Vinogradov 1996; Prodanov et al., 1997) and extensive habitat degradation (Mee 1992; Mee and Topping, 1999). The Agreement on the Conservation of Cetaceans of the Black Sea, the Mediterranean Sea and the contiguous Atlantic area (ACCOBAMS) entered in force on 1 June, 2001, providing the impetus for a new review of the status of cetaceans in the Black Sea.

The Black Sea is bordered by Bulgaria, Georgia, Romania, Russia, Turkey, and Ukraine. The Black Sea is connected to the Mediterranean by the Turkish Straits System (TSS), which is comprised of the Istanbul (Bosporus) Strait, the Marmara Sea and the Canakkale (Dardanelles) Strait. To the North, the Black Sea is connected to the Azov Sea by the Kerch Strait (see Figure 1). The Black Sea is an extremely productive system, although its waters are anoxic below 100-250m, and it is greatly influenced by freshwater input from the Danube and other rivers. The Azov Sea is a very shallow (maximum 14m deep), turbid, low-salinity environment. In severe winters ice covers most of the Azov Sea, but in summer the water temperature may increase to 25 – 30°C. Of the three species of cetacean recorded from the Black Sea, only harbour porpoises and sometimes bottlenose dolphins have been recorded in the Azov Sea (Tsalkin, 1940; Birkun et al., 1997). The TSS region is an area of complex hydrography and is the only biological corridor for movement of marine organisms between the Black and Mediterranean Seas (SC/55/SM2).

5.1 Systematics

Sub-species names have been assigned to all three cetaceans in the Black Sea, based primarily on morphological evidence (*e.g.* Tomilin 1957; Hershkovitz, 1966). The subspecies names are *Phocoena phocoena relicta* (Abel, 1905), *Tursiops truncatus ponticus* (Barabasch-Nikiforov, 1940) and *Delphinus delphis ponticus* (Barabasch-Nikiforov, 1938) The assignment of sub-specific status to Black Sea bottlenose dolphins, at least, has been controversial (SC/55/SM16). In general, the concept of sub-species and definition of what constitutes a sub-species are the subjects of debate, with no agreed criteria. The sub-committee agreed that the level of population discreteness exhibited by all three species in the Black Sea was sufficient to meet criteria used to define sub-species, although it was recognized that the International Whaling Commission does not use this level of taxonomic classification. Furthermore, it was noted that the degree of separation among population units, not the names applied to such units, was of most relevance to conservation.

5.2 Distribution and seasonal movements

There is very limited recent information on distribution of small cetaceans in the Black Sea region, although there are many published observations of this subject in the literature (e.g. Kleinenberg 1956). In general, harbour porpoises and bottlenose dolphins are particularly found in coastal waters, including the Azov Sea, while the distribution of common dolphins is more pelagic.

All three species are found in the TSS (SC/55/SM2). As discussed below, concern has been expressed regarding the effects of heavy vessel traffic in the TSS, which has displaced resident cetaceans and may have curtailed movements of individuals between the Black and Mediterranean Seas (SC/55/SM2).

In the Black Sea proper, bottlenose dolphins are distributed throughout coastal waters, although Mikhalev noted that sightings were also recorded in the open sea. A few resident or seasonally resident groups of bottlenose dolphins have been identified in Ukrainian waters (SC/55/SM17). The sub-committee noted that the use of photo-identification methods would greatly improve our understanding of bottlenose dolphins in this region and **recommended** that a co-ordinated photo-identification programme be conducted throughout the Black Sea and TSS to provide information regarding their ranging patterns, seasonal movements and population structure. Such research could also establish the degree of movement of bottlenose dolphins through the into and out of the Mediterranean Sea.

Harbour porpoises move through the Kerch Strait in spring and are distributed in the southern and western parts of the Azov Sea during summer, before departing in late autumn or early winter (SC/55/SM17). The Azov Sea is, therefore, an important breeding and nursing area for this species (SC/55/SM15). Unusual mass mortality events associated with ice entrapment in the Azov Sea have been recorded four times in the last century (SC/55/SM16). Harbour porpoises are also present along the coasts of all Black Sea countries (SC/55SM2; SC/55/SM17; SC/55/SM23; SC/55/SM27). A recent programme has established sightings and strandings schemes in Romanian waters. Shore-based surveys conducted between April and September, 2002 recorded harbour porpoises between Sulina and Vama-Veche in coastal waters. Harbour porpoises were also sighted further offshore in vessel surveys, mostly in the northern part of the survey area. In Bulgaria, harbour porpoises have been observed in the area close to Cape Emine, east of Cape Galata and near Cape Kaliakra, especially from April to August (SC/55/SM27). Recent observations of a small number of harbour porpoises in the Aegean Sea indicate that there is some dispersal of this species out of the Black Sea (Frantzis et al. 2001; Rosel *et al*. 2003).

There is very little recent information regarding the distribution of common dolphins in the Black Sea. The species is not present in the Azov Sea (SC/55/SM15) but are sighted in offshore waters of the Black Sea, with occasional sightings along the coasts of all six Black Sea countries. Seasonal movements of common dolphins into coastal waters may be associated with those of sprat, anchovy and other pelagic fish species (SC/55/SM2; SC/55/SM17; SC/55/SM23; SC/55/SM27). Common and bottlenose dolphins have been reported from the TSS but groups of dolphins that were considered resident in the Istanbul Straits no longer exist (SC/55/SM2).

5.3 Population structure

It is well established that the Black Sea population of harbour porpoises is discrete and the sub-committee did not review any new information on this subject. The Black Sea population is well differentiated on the basis of both genetic (Rosel *et al*. 1995; 1999) and morphological (Tsalkin 1938; Kleinenberg 1956) evidence. The Black Sea population of harbour porpoises is effectively isolated from those in the Atlantic, so it is highly unlikely that this species would recolonise this area if extirpated. As noted above, a few harbour porpoises have been recorded from the Aegean Sea; their genetic signatures and small size-at-age suggest that these individuals originated from the Black Sea (Rosel *et al*. 2003).

The sub-committee reviewed new information on the population structure of bottlenose and common dolphins in the Black Sea, Mediterranean Sea and eastern North Atlantic (SC/55/SM11). For common dolphins, only a limited amount of material (7 samples) was available from the Black Sea. Despite the limited nature of this material, analysis of nine microsatellite DNA loci showed significant differences among Black Sea, Mediterranean and Atlantic samples. In addition, evidence for sub-structure within the Mediterranean basin was detected. Common dolphins from the Black Sea are also morphologically distinct from their Mediterranean counterparts (Tomilin, 1957), so it is likely that gene flow between these two regions is rare or non-existent. Based on these few samples, the Sub-Committee provisionally concluded that common dolphins in the Black Sea are distinct from those in the Mediterranean Sea and should be treated as a discrete unit for conservation purposes until further analyses are completed.

The sub-committee then considered the issue of bottlenose dolphin population structure in some detail (SC/55/SM11). A reduction of genetic variability at all microsatellite loci was observed in the Black Sea population when compared with populations in the Mediterranean Sea. In addition, F_{st} values (an indicator of genetic divergence between populations) were high, indicating a strong degree of divergence. Natoli provided further evidence of significant genetic differentiation between bottlenose dolphin populations in the Black and Mediterranean Seas from unpublished results of mtDNA analysis. Three related haplotypes were unique to the Black Sea population, indicating that there has been time for population divergence and not just a reduction in genetic diversity relative to the Mediterranean population. Natoli, Cipriano and Baker noted that this evidence, together with the high F_{st} values, strongly suggests isolation of the Black Sea population.

On the basis of these results, the sub-committee concluded that there is very limited or no gene flow between bottlenose dolphins in the Black and Mediterranean Seas. Given the amount of genetic divergence detected (SC/55/SM11), and the existence of morphometric differences (reviewed in Birkun 2003), the Black Sea population has likely followed a separate evolutionary pathway since its foundation. It is unlikely that the Black Sea population of bottlenose dolphins would be replaced on an ecological time scale, if it was extirpated. Therefore, the sub-committee **concluded** that bottlenose dolphins in the Black Sea be treated as a separate and discrete unit for conservation purposes.

The sub-committee **recommended** that additional research be conducted on the population discreteness of common bottlenose dolphins and short-beaked common dolphins from the Black Sea, using additional samples from this and adjacent regions. Such research should pay particular attention to the potential for dispersal into and out of the Mediterranean Sea through the Turkish Straits System. Researchers working with stranded and by-caught cetaceans in all range states of the Black Sea should make every effort to make samples available for analyses of population structure. Additional material may be obtained from museum specimens and biopsy sampling. Furthermore, the sub-committee **recommended** that research should be conducted on population structure of all three species *within* the Black Sea, Azov Sea and Turkish Straits System. Such research should use methodologies most appropriate for each species, including molecular analysis of mitochondrial and nuclear markers

5.4 Abundance

There have been very few recent surveys to estimate abundance of cetaceans in the Black Sea and adjacent waters. Past estimates of abundance (Zemsky and Yablokov 1974; Çelikkale et al. 1989) were criticized by the IWC Scientific Committee on methodological and analytical grounds (Buckland et al. 1992; IWC 1992).

There have been two recent surveys of cetaceans in the TSS using line transect methods. The abundance of bottlenose dolphins was estimated from vessel surveys using line-transect methodology as 485 (203 – 1197; 95% CI) during October 1997 and 468 (184 – 1186; 95% CI) in August 1998 (Dede, 1999). Abundance of common dolphins in the same region was estimated as 773 (292 – 2059; 95% CI) during 1997 and 994 (390 – 2531; 95% CI) in 1998 (Dede, 1999).

The sub-committee reviewed two line transect aerial surveys conducted in the Azov Sea and adjacent waters by Birkun and colleagues in some detail (SC/55/SM15). These surveys were undertaken in July 2001 in the Azov Sea and the Kerch Strait and in August 2002 in the Kerch Strait, Azov Sea and inshore waters of the Black Sea between Cape Chauda, Ukraine and Dagomys, Russia. Both surveys used amphibious, superlight aircraft. Estimates of abundance were calculated for harbour porpoises and bottlenose dolphins; no common dolphins were observed. The first survey yielded an uncorrected estimate of 2,922 ± 1,200 (SD) harbour porpoises in the Azov Sea and 76 ± 36 (SD) bottlenose dolphins in the Kerch Strait. Analysis of results from the second survey resulted in uncorrected estimates of 88 ± 47 (SD) bottlenose dolphins in the Kerch Strait and 823 ± 395(SD) for the adjacent Black Sea shelf area and of 936 ± 361 (SD) harbour porpoises in the southern Azov Sea.

The sub-committee welcomed this work and commended the authors on a well-designed survey. Palka noted that both the survey and analytical methods were generally sound, but that the surveys could be improved if speed and altitude were kept constant (although the light nature of the aircraft used during these surveys prevented this), efforts made to verify group sizes from the air, and the assumption of g(0) = 1 was tested. The sub-committee drew attention to the presence of 16 floating harbour porpoise carcasses and possibly one bottlenose dolphin observed during the two surveys (presumably the result of gill net by-catches) and suggested that these observations could be used to estimate a minimum, uncorrected estimate of by-catch mortality in the region. Similarly, it might be possible to qualify the distribution of fishing effort from observations of vessels data made during aerial surveys. The sub-committee recommended that systematic abundance surveys, such as those described in SC/55/SM15, should be conducted for all three species throughout their range in the Black Sea, Sea of Azov and Turkish Straits System. These surveys should use methodologies (such as line transect surveys and photo-identification mark-recapture) most appropriate for each species.

5.5 Life history

No new information was presented to the sub-committee on life history parameters of Black Sea cetaceans, although there are several published reports on this subject (*e.g.* Tsalkin, 1940, Kleinenberg, 1956; Tomilin, 1957). All three species in the Black Sea are known to be smaller than their Mediterranean or Atlantic counterparts. The sub-committee recommended that further work be conducted on the life history of these species throughout the Black Sea and TTS using samples from stranded or by-caught specimens.

5.6 Ecology

Information on the diet of cetaceans in the Black Sea is available from stomach content analysis of individuals of all three species taken as fisheries by-catch and during the former dolphin fishery (Birkun 2002). Anchovy and sprat are important prey items for both common dolphins and harbour porpoises, whereas whiting is an important prey species for harbour porpoises and bottlenose dolphins. One introduced species, the far-east mullet (*Mugil so-iuy*) has become a prey item of bottlenose dolphins in Ukraine and Russia. In the Azov Sea, gobies (Gobiidae) form an important part of the diet of harbour porpoises (Birkun 2002). Whiting (*Merlangius merlangus euxinus L.*), sprat (*Sprattus sprattus*) and an unidentified sole (*Solea* sp.) species have been recorded from the stomachs of harbour porpoises in the Turkish Black Sea (Tonay and Oz 1999).

5.7 Habitat

The Black Sea is one of the most highly modified marine ecosystems in the world and the habitats of cetaceans in this basin have been degraded by a myriad of human activities. The sub-committee briefly reviewed some of these anthropogenic changes, but a full discussion of their impact was not possible due to the limited time available.

The intensity of shipping traffic has increased dramatically in recent decades throughout the Black Sea, as a result of increases in both the number and size of vessels (SC/55/SM2; Birkun, 2002b). Traffic in the TSS area is particularly heavy, with as many as fifty thousand large vessels transits yearly and two thousand smaller vessel movements daily through very restricted areas. Movements of cetaceans through the TSS are restricted by its topography. The Istanbul strait, for example, is long (30km) and narrow, ranging in width from 0.74 – 1.5km. Öztürk noted that although cetaceans continue to occur in the Turkish Strait System, it is widely believed that the density of cetaceans in this area has decreased. As noted above, the TSS is an area through which genetic exchange can occur between Black Sea and Mediterranean populations of common and bottlenose dolphins, so degradation of this habitat may further isolate the Black Sea populations of both species. Furthermore, such heavy shipping traffic may increase the risk of both chronic and acute pollution. An oil spill in 1994 resulted in the death of several cetaceans; eight harbour porpoises and two bottlenose dolphins (Öztürk and Öztürk, 1996).

The Kerch Strait is another area of high cetacean density where impacts of vessel traffic may be particularly acute (Birkin, 2002b). In addition, several areas of the north-western Black Sea and Azov Sea are subject to oil and gas development and further expansion of these industrial activities is likely. To date, there have been no studies of the impacts of vessel noise or disturbance on any Black Sea cetaceans. Such studies would be of considerable value. In particular, the sub-committee recommended an assessment of the potential for disturbance caused by maritime traffic in the Turkish Strait System and the Kerch Strait.

Some contaminants have been found to be in particularly high concentrations in the tissues of Black Sea cetaceans. This is perhaps not surprising, as the Black Sea receives pollutants directly from bordering states, in addition to the discharge of several major European rivers. In particular, harbour porpoises in the Black Sea are heavily polluted by persistent organochlorine compounds (Tanabe et al. 1997). These authors concluded that DDT was still being used as late as 1993 in the Black Sea watershed. Levels of PCB contamination in harbour porpoises were comparable or lower than those in other areas, but concentrations of HCHs were surprisingly high, marking the Black Sea as a world hotspot for this contaminant. Birkun reviewed results from several other studies of contaminants, including trace metals and radio-nuclides (Birkun 2002c). He also drew attention to the widespread lack of sewage treatment around the Black Sea coastline. Intestinal microbes contained in this sewage are considered a hazard to human bathers and may also infect coastal cetaceans, particularly harbour porpoises and bottlenose dolphins (Birkun, 2002c; 2003). The deaths of harbour porpoises in several unusual mass mortality events were associated with severe microbial infections in their lungs and other tissues.

The isolated nature of the Black Sea makes it particularly vulnerable to the impacts of invasive species. These effects have been particularly evident in the invasion of the ctenophore *Mnemiopsis leidyi*, which is believed to have been carried from the western Atlantic in ballast water. After its arrival in the 1980s, it spread rapidly and reached a maximum biomass of one billion tons (Vinogradov et al., 1989). As a result of this explosive growth, there has been a cascade of changes to the Black Sea marine food web, including unknown ecological effects on cetaceans. *Mnemiopsis leidyi* consumes fish eggs and larvae and has greatly reduced the standing stocks of several important commercial fish species. The introduction of alien species, together with uncontrolled fishing practises, has reduced the abundance of most benthic and pelagic commercial fish species. It is unknown how this depletion affects the ecology or demography of cetaceans in the Black Sea, but these changes in prey populations may have increased the perception of competition between cetaceans and fisheries among fishermen.

5.8 Directed Takes

Uncontrolled directed takes were the primary threat to cetaceans in the Black Sea until a total ban on this harvest was imposed in 1983 (SC/55/SM16). Birkun noted, therefore, that this year (2003) is the 20th anniversary of the ban on commercial dolphin and porpoise fisheries in the Black Sea. All three species were harvested for oil, meal and other products from the 1830s throughout most of the 20th century. As many as four to five million individuals may have been removed during this time (Zemsky and Yablokov 1974; Smith 1982; Yel et al. 1996; Birkun 2002d). The ban appears to have been broadly successful with no evidence of continued directed takes. Bräger noted that all states that have acceded to ACCOBAMS have agreed to a prohibition on all directed takes.

The sub-committee discussed whether it might be possible to use records of these directed catches to reconstruct past population sizes and in so doing gain insight into the current status of the three species. The sub-committee recommended that the possibility of conducting a retrospective analysis of directed catches and by-catches should be explored. The methods for such analysis are well developed and have been used with other small cetaceans (Wade 1993). This approach will require estimation of species ratios, product conversion factors and methods to account for hunting loss, so that aggregate data on total cetaceans landed by weight can be converted to removals by species, area and year.

Directed lethal takes no longer occur, but removals of bottlenose dolphins have continued. These removals have been primarily for use in dolphinaria, scientific institutions and military facilities in Black Sea states and elsewhere. There have been a number of recent initiatives to reduce or eliminate these captures. For example, the Ukrainian Ministry of the Environment recently banned such removals for a three-year period. In 2002, CITES set a zero quota for primarily commercial export of Black Sea bottlenose dolphins (SC/55/SM12). In addition, in 2003 the Russian Federation denied a request for a permit to capture and remove bottlenose dolphins. In view of the many other threats faced by this species in the Black Sea, the sub-committee welcomed these conservation measures and recommended that any removals of live cetaceans be preceded by a rigorous assessment of the impacts of such removals. Such an assessment should consider the size of the source population and its ability to sustain such removals.

5.9 Incidental Takes

The sub-committee then reviewed the incidental captures of Black Sea cetaceans in fishing activities. All three species are known to be taken as by-catch, but incidental takes of harbour porpoises are of greatest concern. Bottlenose dolphins and harbour porpoises are caught in a variety of fisheries but bottom-set gillnets set for turbot pose the greatest threat. These by-catches appear to occur in all Black Sea shelf waters, including the all six states (SC/55/SM2; SC/55/SM16; SC/55/SM23, SC/55/SM27; Birkun 2002a; Radu *et al*. 2003). In all areas harbour porpoises are the most frequently entangled and preliminary indications suggest that by-catch rates of this species are high. For example, in six trips carrying observers in Turkish waters, 13 harbour porpoises were taken as by-catch (SC/55/SM2). Similar efforts to estimate by-catch rates are underway elsewhere. For example, in Romania an initiative has recently been started to interview local fishermen to document and assess by-catch.

The by-catch of common dolphins appears primarily in pelagic trawling operations, but little is known of their extent or magnitude (SC/55/SM16). The sub-committee encouraged efforts to assess the nature and magnitude of these by-catches.

It was also clear from the sub-committee's discussions that illegal, unreported or unregulated (IUU) fisheries are widespread in the Black Sea and that a very significant by-catch occurs in these fisheries that are especially difficult to monitor. For example, Radu et al. (2003) reported on efforts to recover gillnets that had been unlawfully set in Romanian waters in April 2002. Approximately 100 specimens were incidentally caught; at least twenty harbour porpoises were retrieved during confiscation of these nets. Furthermore, between March and September 2002, 56 cetaceans were found stranded on beaches; most (90-95%) were suspected by-catches (SC/55/SM23). The sub-committee recommended that the magnitude of by-catches should be determined for all three species of cetaceans in Black Sea fisheries. This assessment should be conducted as a matter of some urgency for by-catches of harbour porpoises in bottom-set gill net fisheries for turbot and sturgeon. Whenever possible, independent observer monitoring programmes should be used to estimate by-catch rates in these fisheries. In addition, efforts should be made using indirect means to estimate fishing effort and cetacean by-catches in IUU fisheries.

The sub-committee was encouraged to learn that both the General Fisheries Commission of the Mediterranean (GFCM) and the Black Sea Environmental Programme consider by-catch to be an important issue (see, for example, Öztürk and Karakulak 2003) and that the draft Black Sea Fisheries Convention of Sustainable Fisheries also treats by-catch as a serious concern. The sub-committee urges these bodies to take action in determining the magnitude of by-catch for all three species of cetaceans in Black Sea fisheries. As noted above, this assessment should be undertaken as a matter of urgency for by-catches of harbour porpoises in turbot bottom-set gill net fisheries. The sub-committee also urges these bodies to investigate potential mitigation measures to reduce by-catch and offers its assistance with both the assessment and mitigation of these by-catches.

To date, no attempts have been made to mitigate cetacean bycatch in the Black Sea. In the past, the sub-committee has concluded that it is not necessary to conduct further experiments to demonstrate the efficacy of acoustic alarms to reduce the by-catches of harbour porpoises in bottom-set gill net fisheries (IWC 2000). However, members of the sub-committee questioned whether acoustic alarms could be used successfully in the Black Sea because of the small-scale nature of gillnet fisheries and the existence of widespread IUU fisheries. Furthermore, at the present time there is no effective management system in place to address cetacean by-catches; such a system is necessary to ensure the proper use of such devices. The sub-committee recommended, therefore, that any efforts to implement acoustic alarms to reduce by-catch rates of cetaceans in Black Sea fisheries should be preceded by a comprehensive evaluation of the potential efficacy of these devices with respect to each fishery's scale, methods, economic value and management regime

5.10 Other

Krivokhizhin & Birkun (SC/55/SM17) reviewed mass mortality events observed among harbour porpoises and common dolphins of the Black Sea. It has not been possible to determine the ultimate cause of all such events, but an epizootic of common dolphins in 1994 was determined to have been caused by a morbillivirus. Studies of serum from harbour porpoises in subsequent years suggest that this virus is persistent in the Black Sea. It is likely that the many changes in the habitat of Black Sea cetaceans, including high levels of persistent organochlorine contaminants, the presence of human pathogens from sewage outfalls, and a considerable reduction in prey populations, interact in a complex manner with such diseases.

Birkun also described reports of lone neonate harbour porpoises recorded in the northern Black Sea in May 2003. These animals are very young and unlikely to survive alone. The sub-committee discussed these unusual observations and concluded that by-catch of lactating females could be responsible. To date there have been no observations of violent interactions between bottlenose dolphins and harbour porpoises, similar to those observed in other areas. Researchers conducting post-mortem examination of stranded dolphins and porpoises are aware of the pathological evidence associated with such interactions, but have not observed any instances of such trauma.

The sub-committee briefly reviewed efforts to record data and gather samples from cetacean strandings and by-catches in the riparian states of the Black Sea. Samples collected from by-caught and stranded specimens have proven to be of great value in providing information regarding the life history, ecology and health status of other populations of small cetaceans. Currently, however, the extent and intensity of such efforts vary substantially across the region. In only a few areas, such as Crimea, European Turkish coast and Romania are there well established strandings programmes, and in most others such programmes are absent or only in the very early stages of development (SC/55/SM2; SC/55/SM23; SC/55/SM27). In all areas the coverage of stranding programmes is incomplete. The sub-committee reiterated the considerable value of such programs and encouraged researchers to assist in their development through regional and international collaboration.

5.11 Consideration of Status

The sub-committee was unable to fully evaluate the status of cetaceans in the Black Sea due to a lack of information. In general, however, the sub-committee concluded that the three species likely experienced a dramatic decline in abundance in the 20th century as a result of large directed catches. In addition, current fisheries by-catches and extensive habitat degradation pose significant threats to the continued existence of these species.

Globally, bottlenose dolphins are listed as *Data Deficient* by the World Conservation Union (IUCN) and are listed in Appendix 2 of the Convention on Trade in Endangered Species (CITES). In response to a proposal from Georgia to transfer Black Sea bottlenose dolphins to Appendix 1 of CITES, a zero export quota was established for Black Sea bottlenose dolphins at the 2002 Conference of Parties (SC/55/SM12), which remained with other bottlenose dolphins in Appendix 2. This agreement effectively prohibits international trade of Black Sea bottlenose dolphins for "primarily commercial purposes." Simmonds outlined the reasons for the CITES trade ban (noting the original case made for the listing under CITES Appendix 1, using CITES Res. Conf, 9.2.4) but there remains a risk of trade continuing under other guises.

As noted above, the sub-committee concluded that the Black Sea population of bottlenose dolphins should be considered as a separate and discrete unit for conservation purposes. Critical information on abundance, population structure, rate of increase, and mortality levels are lacking for this population. The known threats to bottlenose dolphins in the Black Sea are by-catch in fisheries, habitat degradation and directed catches of live specimens. The sub-committee expressed concern over the potential effects of these threats to small and possibly isolated population units that may occur throughout the Black Sea and adjacent waters. Given the degradation of their habitat, the existence of current by-catches and past directed catches, the sub-committee expressed concern regarding the status of bottlenose dolphins in the Black Sea.

It is widely recognized that harbour porpoises in the Black Sea region constitute a separate population (Rosel et al. 1995; 1999). The IUCN lists the Black Sea harbour porpoise population as vulnerable, although critical information on absolute abundance, and population trends is lacking. The primary current threats to harbour porpoises in the Black Sea are by-catch in fisheries and habitat degradation including the potential effects of contaminants. In addition, very large, directed catches of this species occurred throughout the Black Sea during the past century. The sub-committee expressed particular concern over the large but unquantified by-catches of harbour porpoises in gillnet fisheries and concluded that the conservation status of this population would be greatly improved if existing fisheries regulations restricting fishing effort and the use of certain gear types were enforced. Large and potentially unsustainable by-catches of harbour porpoises occur in such fisheries, particularly bottom-set gill net fisheries, throughout the Black Sea shelf area.

The global status assigned to common dolphins by the IUCN is "least concern", although there is a current proposal to list the population in the Mediterranean Sea as endangered (Reeves, pers. comm.). Of all the Black Sea cetaceans, least is known about common dolphins. Limited genetic evidence suggests that common dolphins in the Black Sea may constitute a discrete population. This population has experienced at least one morbillivirus epizootic and animals are taken in unknown numbers in trawl fisheries. The sub-committee recognised the existence of these threats, but was unable to evaluate the status of this population because information on population structure, rate of increase and mortality levels is lacking.

The sub-committee noted that co-operation among range states, such as that established under the Agreement on the Conservation of Cetaceans of the Black Sea and Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS), will be essential to the conservation of cetaceans in the Black Sea. Members of the sub-committee also agreed that collaboration between the IWC Scientific Committee and ACCOBAMS should be encouraged, as agreed in the memorandum of collaboration between IWC, CMS and its relevant regional agreements. Equally important will be adequate support from interested researchers and groups from both inside and outside the region, together with funding from appropriate authorities and non-governmental organisations. ACCOBAMS Parties have agreed, as one of their priorities in the 2002-2006 period, that a conservation plan for Black Sea cetaceans should be prepared. Ukraine and Turkey have already established their National Plans of Action in order to protect cetaceans and Romania is currently preparing a similar plan in consultation with the ACCOBAMS Secretariat.

The development of conservation plans for Black Sea cetaceans could be informed by similar processes that have been ongoing elsewhere notably in northern Europe, including those under the auspices of ASCOBANS (for example the Recovery Plan for Harbour Porpoise in the Baltic Sea and the SCANS surveys) and those within the framework of the IUCN Species Survival Commission (Reeves et al., 2003).

The sub-committee expressed its appreciation to the invited experts from the region who attended the meeting, presented their work and contributed to the discussion and, in particular, to A. Birkun for the extensive background documentation prepared for the meeting and for the assistance given to the convenor in arranging range-state participation.

6. PROGRESS ON PREVIOUS RECOMMENDATIONS

The sub-committee noted IWC Resolution 2001-13, which directs it to continue to review progress on recommendations and resolutions relating to critically endangered stocks of small cetaceans on a regular basis. This year, the sub-committee reviewed progress on several of these stocks.

6.1 Baiji

The baiji (*Lipotes vexillifer*) is the most endangered cetacean. Its range is restricted to the Yangtze River and its population size is probably only a few tens of animals (IWC 2001). Given its critically endangered status, the Commission has requested that the Government of China report progress on the conservation of this species to the Scientific Committee on an annual basis. This year the sub-committee was pleased to receive information by way of the 2002 Commission meeting in Shimonoseki. The sub-committee welcomed the news that the government of China had introduced a seasonal fishing moratorium in the middle and lower reaches of the Yangtze River, and was planning further such measures in the upper reaches of the river. The sub-committee was also encouraged by China's announcement that it would establish a national plan with respect to the environmental degradation of the river.

The sub-committee also noted the publication of the results of baiji surveys conducted by Chinese scientists from 1997 to 1999 (Zhang et al. 2003). Baiji were seen in each year of the study, confirming the continued existence of the species. This paper also reports observations of interactions between baiji and finless porpoises and cites electro-fishing and the use of explosives for construction as threats to the continued existence of the bajii. The sub-committee agreed that this new work was extremely valuable. Reeves briefly reviewed the outcome of a meeting organized by Conservation International in April 2003, intended to consider the options available for intervention to prevent the baijis's extinction.

There was agreement among sub-committee members that these new initiatives and information offered a glimmer of hope for the future of the baiji, but that prospects for its survival continue to be extremely poor. The sub-committee looks forward to receiving further news of any developments regarding its status.

6.2 Vaquita

The sub-committee has followed with great interest progress on conservation efforts on behalf of the highly endangered vaquita (*Phocoena sinus*) and this year reviewed three papers on this topic. Acoustic surveys on the distribution of the vaquita in the northern Gulf of California were carried out in 2002 and 2003 (SC/55/SM5). The results of these surveys suggest that the current distribution of this species may have contracted further during the past few years. The key remaining area of vaquita occupancy is fished intensively and in which by-catch mortality may be expected. This area is only partially inside the boundaries of the Upper Gulf of California and Delta of the Colorado River Biosphere Reserve.

The sub-committee reviewed progress on the conservation of vaquita in Mexico (SC/55/SM4 & SC/55/SM28). The Government of Mexico, its scientists, and several non-governmental organisations have been working very hard to implement the recommendations of the International Committee for the Recovery of Vaquita (CIRVA). It was clear that implementation of such conservation measures has been extraordinarily difficult, given the socio-economic realities of the region. These conservation measures include education and outreach programmes, significant reductions in fishing effort, changes to fisheries policy and regulations, co-operation with artisanal fisheries groups, the implementation of environmental impact assessments for trawling operations and work to develop new and less destructive fishing gears. The sub-committee welcomed the progress achieved in these diverse conservation measures over the last year and greatly commended Rojas-Bracho, Manzanilla-Naim, the Government of Mexico, and the coalition for the upper Gulf of California. for their considerable efforts to improve the future prospects for the vaquita under very difficult conditions. The sub-committee re-iterated its grave concern about the survival of this species. It noted that CIRVA would meet later in 2003, with the participation of several sub-committee members, and looked forward to receiving an update of progress towards conservation of this highly endangered species again next year.

6.3. Harbour porpoises in the Baltic Sea

The harbour porpoise has experienced major declines in parts of its range, perhaps most notably in the Baltic Sea. An aerial survey conducted in July 1995 estimated 599 (CV 0.57) porpoises present in the Baltic Sea (Hiby and Lovell 1996). This survey covered the suggested current range of the Baltic porpoise, except Polish coastal waters where by-catches are known to occur and where it has been suggested that a significant part of the Baltic population might still occur. Acoustic and visual boat based surveys were conducted in the Baltic Sea and adjacent waters in 2001 and 2002 (SC/55/SM21). The 2001 survey confirmed that porpoises still occur in Polish waters of the Baltic but only in low numbers (SC/54/SM3).

The 2002 survey was conducted during six weeks in July and August covering the known range of the Baltic harbour porpoise (i.e. the combined area of the 1995 and 2001 surveys). Three adjacent areas, the Mecklenburger Bight and the North and South Kiel Bights, were also surveyed to estimate the relative abundance of porpoises outside the Baltic Sea proper. Surveys were conducted along pre-planned zig-zag transects area using an auxiliary powered sailing vessel. The boat was equipped with an automatic porpoise detection system (Gillespie and Chappell, 2002). The porpoise detector consisted of a two-element hydrophone towed 100 m astern of the survey vessel at all times. In addition two visual observers were stationed on an observation platform with an eye height of approximately 5.3 m during daylight hours in Beaufort two or less. Three porpoises were detected acoustically on 2946 km of survey track in the Baltic Sea proper. No porpoises were sighted during the 253 km of track line surveyed visually. The results indicate that the relative abundance of porpoises is one to two orders of magnitude lower in the Baltic proper (0.1 detections / 100km) than in the Mecklenburger Bight (3.2/100km), South Kiel Bight (10.5/100km) and North Kiel Bight (16.8/100km).

There was discussion among members of the sub-committee as to whether the acoustic surveys could have missed small areas of porpoise occurrence, particularly if individual porpoises vocalise less frequently when alone or in low densities. It was agreed that this was possible, and efforts to determine if this has influenced survey results would be valuable. However, a finding that acoustic behaviour changes with animal density would not refute the primary conclusion that the density of porpoises in the Baltic, including Polish waters, was extremely low. The sub-committee noted with concern that porpoises continued to be taken as by-catch in Baltic set and drift gillnet fisheries despite their extremely low abundance.

These results demonstrate the potential for using acoustic surveys to investigate trends in relative abundance of porpoise populations over time and between regions. As noted above, similar methods are also being used to monitor the distribution and relative abundance of the vaquita in the Gulf of California (SC/55/SM5). The acoustic survey method used in SC/55/SM21 provides information on detection rates, but has not yet been used to estimate detection probability as a function of perpendicular distance from the track line. Therefore, at present, these acoustic surveys can only be used for measuring relative, as opposed to absolute, abundance. Combined visual and acoustic data can potentially provide absolute abundance estimates, but these methods are still under development.

Berggren also reported that an aerial survey to estimate the abundance of porpoises was conducted in the Baltic Sea in July 2002 covering the same area. The results of this survey will be reported to the sub-committee next year.

Kock reported that aerial surveys of the German portion of the Baltic Sea detected groups of up to 10 harbour porpoises on Oderbank in May-June 2002, but not thereafter (July – November).

The results from SC/55/SM21 confirm that very few porpoises remain in the Baltic and further highlight the endangered status of this population and the urgent need for immediate actions to prevent future anthropogenic mortality. Last year the sub-committee made a series of recommendations concerning the draft ASCOBANS recovery plan for harbour porpoises in the Baltic Sea (known as the Jastarnia Plan) and endorsed the plan.

These recommendations were subsequently incorporated into the final draft plan, which is to be considered for formal acceptance at the next Meeting of the Parties in August 2003. The observer's report from the April 2003 meeting of the Advisory Committee of ASCOBANS (IWC/55/8, Appendix J) noted that "some steps have already been taken to implement the plan". The sub-committee reiterated its strong endorsement of the Jastarnia Plan and hopes that it will be adopted and implemented by the Parties.

6.4 By-catch mitigation

Northridge (SC/55/SM26) presented an overview of trials of new methods used to mitigate dolphin by-catch in the UK pelagic trawl fishery for bass (*Dicentrarchus labrax*). The fishery operates primarily in the western English Channel from October to April and effort has increased significantly during the past decade. Independent observers were placed on fishing vessels; observed effort comprised 30% of total fishing effort. These observers monitored over 310 tows during 193 days at sea over the three-year period, in which 91 common dolphins were taken as by-catch. A number of methods were tested to reduce these by-catches. Acoustic alarms (pingers) were deployed both at the mouth of the trawl and further back in the net, but did not appear to reduce by-catch. Trawls equipped with Nordmore grids (similar to turtle excluder devices) experienced fewer by-catches than unmodified nets. However, care should be taken in the interpretation of these preliminary results, as dolphins did not appear to be directed out of the net by the grid as intended, but instead did not enter the rear portion of the net. Two possible factors may explain for these results: the dolphins could have responded to the grid-sensor device (which emits a 186 dB re 1μPa @ 1m, 50 kHz signal) or to the visual appearance of the stainless steel grid itself.

The sub-committee expressed concern over the magnitude of by-catches of common dolphins and other small cetaceans in this and other similar trawl fisheries, based on data from the observer programme and the high number of stranded animals on the coastlines of England, France and Ireland that appear to have been taken in these fisheries. Many pelagic trawl fisheries from different countries target various fish species (e.g. herring, horse-mackerel) in this area. The sub-committee recommended that independent observer programmes be established to document the extent of by-catch in pelagic trawl fisheries of all nations where such programmes do not already exist in this region. The sub-committee also looked forward to receiving an update on the mitigation measures described in SC/55/SM26 at its meeting next year.

6.5 Dall's porpoise

Read reminded the sub-committee of the IWC Resolution 2001-12, which directed the Scientific Committee to complete a full assessment of the status of exploited Dall's porpoise stocks as soon as sufficient information becomes available (IWC, 2002). In its review of the subject in 2001, the sub-committee was unable to complete this assessment because the Government of Japan had declined to provide relevant data to the Scientific Committee. The Government of Japan has not changed its position on this matter (see Annex X) and scientists from the Japanese delegation did not participate in the work of the sub-committee again this year. Nevertheless, the hand harpoon fishery for Dall's porpoise continues in Japan. The sub-committee noted that catch statistics and information on quotas for small cetacean fisheries, including relevant information on Dall's porpoises, are available on the website of the Japanese Fisheries Agency (http://www.jfa.maff.go.jp/whale/index.htm). It was agreed that the chair of the sub-committee should request clarification from the Chair of the Scientific Committee and IWC Secretariat regarding use of these data.

6.6 Other recommendations

6.6.1 White whales and narwhals

In previous years, the sub-committee has expressed concern about catches and quotas of white whales and narwhals (IWC 1992; IWC 2000). The circumpolar ranges of narwhals and white whales fall primarily within the waters of five countries: Russia, Norway, Greenland, Canada and the United States. Substantial catches of one or both of these species are made in Greenland, Canada and the United States. There was insufficient time at this year's meeting to address in depth the status of white whales and narwhals, or to review the sub-committee's past recommendations in regard to these two species. Reeves brought several items of particular concern to the attention to the sub-committee, however, particularly in West Greenland, Canada and Russia.

As mentioned in the observer report from the September 2002 meeting of the NAMMCO Scientific Committee (IWC/55/8 Appendix H), although progress has been made in implementing a quota system for white whales and narwhals in Greenland, the catch figures submitted to NAMMCO by Greenland 'indicate that little or no reduction in catch has taken place' despite advice from the NAMMCO SC in 2000 and 2001 that the West Greenland stock of white whales 'is substantially depleted', that recent catch levels have been 'several times the sustainable yield' and that catches 'must be substantially reduced if the stock is to recover'. The NAMMCO SC noted in 2002 that 'the apparent delay in reducing the catch to about 100 animals per year will result in further population decline and will further delay the recovery of this stock'. These recent comments from NAMMCO reinforce concerns expressed previously by this sub-committee concerning the West Greenland white whale stock. Therefore, the sub-committee reiterated its previous recommendation that this stock should be considered to be 'of highest conservation concern' and that 'efforts to improve its current status should be undertaken and supported'.

Reeves also noted that the east Hudson Bay white whale population continues to decrease (Kingsley 2000) with no effective hunt management. The committee re-iterates its concern about this population and requests that the Government of Canada supply catch data on both white whales and narwhals to the IWC.

With regard to narwhals, the NAMMCO SC noted in 2001 that catches in some areas of Greenland had increased over the past decade and that further increases might be expected if hunters switch from white whales to narwhals in the event that restrictions are imposed on the white whale hunt. In a joint meeting of the Canada/Greenland Joint Commission on Conservation and Management of Narwhal and Beluga's SC and the NAMMCO SC's Working Group on the Population Status of Narwhal and Beluga in the North Atlantic it was concluded that ' considering just reported catches and reasonable allowances for narwhal killed and lost, mortality due to hunting has been in excess of 1,000 narwhal annually through the 1990s and there is a high likelihood that removals due to hunting have increased recently.' The sub-committee reiterated its previous recommendations concerning the desirability of better information on stock identity and catch reporting of narwhals.

No catch data for white whales are provided formally by Russia, either directly to the IWC or indirectly via another management body. Russian scientists reported during this sub-committee's last review of white whale and narwhal stocks in 1999 that "a few occasional takes" of white whales occur, including both live-captured animals and animals killed for meat or other products (IWC 2000). As was noted in last year's report of this sub-committee (JCRM 5, Suppl., pp. 372-3), catch quotas of 1000 white whales (for harvest) and 10 killer whales (for live-capture) were issued in 2002 by the Russian Central Committee for Fisheries. Such quotas for local hunters continue to be decreed by Russian authorities for zone and sub-zone, including areas of the western Bering Sea, Okhotsk Sea, Barents Sea and White Sea. The sub-committee has expressed concern in the past about the status of a number of Russian white whale stocks because of their depleted status, small population or reduced range, and also made recommendations concerning needed research. Last year, for example, the sub-committee recommended that authorized catches of small cetaceans in Russia be preceded by population assessment and evaluation of likely impacts. No new or recent information has been provided on progress in response to these and other recommendations, nor has the situation in regard to catch reporting improved despite repeated requests for catch information as supplied by the other circumpolar countries (if not directly to the IWC, then at least to some other international body). The sub-committee reiterated the importance of obtaining these basic data and encouraged rigorous assessment of white whale stocks that are subject to direct exploitation or significant disturbance from various human activities.

6.6.2 Humpback dolphins

The sub-committee was appraised of progress on its recommendation regarding the collection of samples from humpback dolphins (*Sousa* spp.) for genetic analysis throughout the range to clarify their taxonomic status and phylogenetic relationships. Minton noted that a significant number of samples have been acquired from South Africa, Oman and Southeast Asia, increasing both sample sizes and the geographical range of sample origins. These samples include specimens collected from beach-cast animals, and biopsies collected during dedicated surveys in Oman. Additional biopsy samples have been collected in Zanzibar (Berggren, pers comm.). Some samples are still awaiting permits for export, but it is expected that sample distribution will be completed within the next few months, and Rosenbaum will begin analysis shortly thereafter. The-committee welcomed this development and look forward to receiving updates on the analysis.

6.6.3 Monitoring by-catches

Progress on monitoring small cetacean by-catches in Norway was reported by Bjørge. Norway has recently commenced an independent monitoring scheme on its offshore fishing vessels to assess by-catch levels. The sub-committee welcomed this initiative and look forward to receiving updates in due course.

7. OTHER PRESENTED INFORMATION ON SMALL CETACEANS

Due to time constraints, the sub-committee was only able to review a small number of the papers presented to it this year under this agenda item.

SC/55/SM3 presented preliminary estimates of marine mammal mortality and biological sampling of cetaceans in California halibut/angel shark set gillnet and swordfish/thresher shark drift gillnet fisheries for 2002. Due to an area closure, the set net fishery was not observed in 2002, so mortality estimates are based on previous years' data. Estimated mortality in the set gillnet fishery for all strata (CVs in parentheses) were: 16 (0.77) harbour porpoise and 3 (0.71) unidentified dolphins. In the driftnet fishery, 20% of all fishing trips were observed. Estimated mortality in this fishery was 49 (0.32) short beaked common dolphin (*Delphinus delphis*), 15 (0.58) long-beaked common dolphins (*D. capensis*), 15 (0.58) northern right whale dolphin (*Lissodelphis borealis*) and 5 (1.00) Pacific white-sided dolphins (*Lagenorhynchus obliquidens*). The sub-committee thanked the authors for their continued contribution to its work.

SC/55/SM7 reported on the mortality of Commerson's dolphin (*Cephalorhynchus commersonii*) in southern Patagonia, Argentina. It was estimated that a total of 179 (95% CI = 141 - 212) dolphins were incidentally caught in gill net fisheries in a relatively small area in the 1999/2000 season. Although no abundance estimate of Commerson's dolphins is available for this region, the authors concluded that this by-catch is of concern.

SC/55/SM24 outlined a proposal to estimate cetacean abundance in European Atlantic waters. In 1994, the Small Cetacean Abundance in the North Sea and adjacent waters (SCANS) survey provided the first abundance estimate for the harbour porpoises and other small cetaceans in this area. The aim was to provide information essential for the assessment and management of harbour porpoise by-catch. After almost ten years, by-catches of harbour porpoise and other small cetaceans, particularly common dolphins, in European waters are still a significant conservation issue in this region. A second SCANS-type survey is proposed for 2005/2006 to include areas covered in 1994 and to extend coverage to the west and south where information on cetacean abundance is limited or absent. The key objectives are to obtain accurate and precise abundance estimates for cetacean species, develop and test methods for monitoring, and provide a framework to aid managers to achieve conservation objectives. The sub-committee welcomed and fully endorsed this proposal.

The problem of net depredation by bottlenose dolphins in the Aegean Sea was outlined in SC/55/SM25. The nature and scale of the damage caused by dolphins in this trammel net fishery was quantified and the authors also evaluated the use of an acoustic deterrent device to decrease the frequency of these interactions. This device was a small battery powered device similar to a pinger, but designed to produce broadband ultrasonic signals (30 – 160kHz with a source level of 155dB re 1µPa @ 1m). Damage to the gear consisted mostly of holes and 85% of these holes were attributed to dolphins. There was a highly significant difference in the number of dolphin holes among nets with active and inactive deterrent devices; nets with active devices had a 76% reduction in the number of holes attributed to dolphins. There was discussion within the sub-committee about the mechanism that resulted in decreased depredation as a result of the use of these devices and some concern expressed about their possible unregulated and unmonitored use. The sub-committee encouraged further research on the issue of depredation (which has been reported from many parts of the Mediterranean) and recommended that if these devices are widely used, these fisheries should be monitored to determine their efficacy.

8. TAKES OF SMALL CETACEANS

The sub committee was not able to review its table of recent catches (Appendix 2) of small cetaceans at this year's meeting. Nevertheless, as in the past, the sub-committee noted that this table is incomplete and urged contracting governments to provide this information to the IWC.

Reeves brought to the attention of the sub-committee an item from last years report of the Scientific Committee which described 10 bowhead whales killed by a large pod of killer whales near Qeqertarsuaq in Disko Bay during four days in late April 2002 (IWC, 2003b, p. 240; IWC 2003c, p. 46). Subsequently, a number of these killer whales were killed by hunters. The sub-committee requests that the relevant authorities in Greenland provide more details on this and other similar incidents to next year's Committee meeting.

9. WORK PLAN

The sub-committee reviewed its schedule of priority topics. Those currently held by the sub-committee (IWC, 2003a, p 373) are as follows:

(1) Systematics and population structure of *Tursiops*

(2) Status of ziphiids in the Southern Ocean

(3) Status of small cetaceans in the Caribbean Sea

(4) Review of the status of *Pontoporia*

After some discussion, in light of recent research efforts and the availability of new data on stock structure, abundance estimates and by-catch estimation (e.g. Secchi et al., 2003; Valsecchi & Zanelatto 2003), the sub-committee agreed to adopt a review of the franciscana as its priority topic for next year.

The possibility of carrying out a review of the population structure and systematics of killer whales was also discussed, and the sub-committee agreed to put this topic on its list of future priority topics. In addition, consideration was given to examining the issue of depredation of fisheries catches by small cetaceans in the Mediterranean region. Given the location of next year's meeting in Sorrento, the sub-committee suggested that the feasibility of a one-day workshop in advance of the meeting be investigated. Read agreed to take examine the feasibility of such a workshop, after seeking the advice of the Chair of the Scientific Committee and local scientists in Italy.

10. ADOPTION OF REPORT

The report was adopted at 2200hrs on 1st June 2003. On behalf of the sub-committee, Read thanked the rapporteurs for their diligent work and expressed his gratitude to the invited experts from the Black Sea region for their important contribution.

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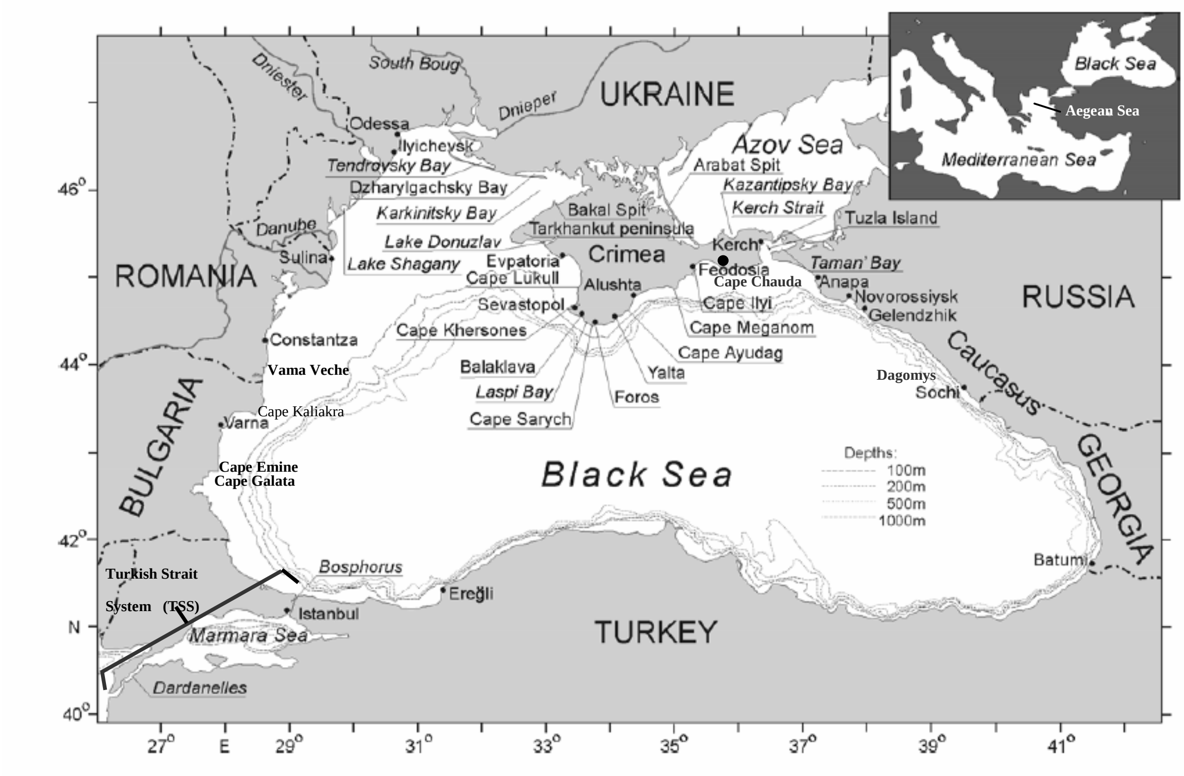

Figure 1. Extracted from Birkun (2003) SC/55/For Information 16.

Appendix 1

AGENDA

1. Election of chair
2. Appointment of rapporteurs
3. Adoption of agenda
4. Review of documents
5. Status of small cetaceans in the Black Sea
    5.1 Systematics
    5.2 Distribution and seasonal movements
    5.3 Population structure
    5.4 Abundance
    5.5 Life history
    5.6 Ecology
    5.7 Habitat
    5.8 Directed takes
    5.9 Incidental takes
    5.10 Other
    5.11 Consideration of status
6. Progress on previous recommendations
    6.1 Baiji
    6.2 Vaquita
    6.3 Baltic harbour porpoise
    6.4 By-catch mitigation
    6.5 Dall's porpoise
    6.6 Other
7. Other
8. Takes of small cetaceans
9. Work plan
10. Adoption of report

SMALL CETACEAN CATCHES 1999-2002

All information was taken from National Progress reports unless otherwise stated. Catches are presented by nation, rather than ocean area, except in the case of the data submitted by the IATTC for the eastern tropical Pacific (ETP). In this case, the submitted estimated catches are not broken down by country and a summed total incidental catch for the participating countries is given. Catches are tabled according to the calendar year in which they were taken. Direct and incidental removals (including live captures) are recorded but not stranded animals unless thought to be human induced. The reported catch columns include catches reported by observer programmes, from interviews with fishermen and incidental reports (e.g. stranded whales determined to have died in nets).

	1999					2000					2001					2002				
	Direct		Indirect		Live	Direct		Indirect		Live	Direct		Indirect		Live	Direct		Indirect		Live
Species	Rep.	Est. total	Rep.	Est. total	Rep.	Rep.	Est. total	Rep.	Est. total	Rep.	Rep.	Est. total	Rep.	Est. total	Rep.	Rep.	Est. total	Rep.	Est. total	Rep.
Argentina																				
Dusky dolphin	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Franciscana	-	-	-	-	-	-	-	49[a]	272-570[ba]	-	-	-	28[e]	160-306	1	-	-	52[h]	215[h]	1[h]
Peale's dolphin	-	-	-	-	-	-	-	1[b]	5[b]	-	-	-	-	-	-	-	-	-	-	-
Commerson's dolphin	-	-	12[f]	-	-	-	-	103[c]	100-212[cg]	-	-	-	37[d]	-	-	-	-	1[j]	-	-
Burmeister's porpoise	-	-	-	-	-	-	-	1[k]	1[k]	-	-	-	-	-	-	-	-	1[i]	-	-
Common dolphin			18[l]	60[l]																
Australia																				
False killer whale	-	-	-	-	-	-	-	-	-	-	-	-	1[h]	-	-	-	-	-	-	-
Bottlenose dolphin	-	-	9	-	-	-	-	5[a]	5[a]	-	-	-	9[d]	9[d]	-	-	-	8[i]	8[i]	-
Bottlenose dolphin sp	-	-	-	-	-	-	-	-	-	-	-	-	3	3[g]	-	-	-	-	-	-
Indo-Pacific bottlenose dolphin	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1[j]	1[j]	
Common dolphin (?sp.)	-	-	8	-	-	-	-	-	-	-	-	-	7[e]	7[e]	-	-	-	15[k]	15[k]	-
Irrawaddy dolphin	-	-	-	-	-	-	-	2	2	-	-	-	-	-	-	-	-	-	-	-
Indo-pacific humpback	-	-	2	-	-	-	-	1	1	-	-	-	2	2[f]	-	-	-	6[l]	6[l]	-
Spinner dolphin	-	-	1	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-
Short beaked common dolphin	-	-	8	-	-	-	-	9[b]	9[b]	-	-	-	-	-	-	-	-	-	-	-
Pantropical spotted dolphin	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-
Unidentified dolphin	-	-	12	2	-	-	-	6[c]	6[c]	-	-	-	2	2	-	-	-	-	-	-
Brazil																				
Bottlenose dolphin	-	-	-	-	-	-	-	1[c]	-	-	-	-	-	-	-	-	-	-	-	-
Franciscana	-	-	81[a]	931[a]	-	-	-	103[d]	>1496[d]	-	-	-	19[h]	-	-	-	-	60[k]	60[k]	-
Tucuxi	-	-	17[b]	141[b]	-	3	-	8[e]	-	-	-	-	4[i]	-	-	-	-	18[l]	18[l]	-
Atlantic spotted dolphin	-	-	-	-	-	-	-	2[f]	-	-	-	-	-	-	-	-	-	-	-	-
Pantropical spotted dolphin	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1[m]	1[m]	-
Rough-toothed dolphins	-	-	7	150	-	-	-	-	-	-	-	-	-	-	-	-	-	1[n]	1[n]	-
Striped dolphin	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Inia geoffrensis	-	-	-	-	-	-	-	-	-	78[g]	-	-	-	-	-	>50[j]	>50[j]	-	-	-
Clymene dolphin	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1[m]	1[m]	-
Unidentified dolphins	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Unidentified species	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Canada																				
Narwhal	a	-	-	-	-	a	-	-	-	-	559[b]	-	-	-	-	a	-	-	-	-
White whale	a	-	-	-	-	a	-	-	-	-	375[c]	-	-	-	-	a	-	-	-	-
Chile																				
Burmeister's porpoise	-	-	1[b]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Long-finned pilot whale	1[a]	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-

Species	1999					2000					2001					2002				
	Direct		Indirect		Live	Direct		Indirect		Live	Direct		Indirect		Live	Direct		Indirect		Live
	Rep.	Est. total	Rep.	Est. total	Rep.	Rep.	Est. total	Rep.	Est. total	Rep.	Rep.	Est. total	Rep.	Est. total	Rep.	Rep.	Est. total	Rep.	Est. total	Rep.
Denmark																				
Harbour porpoise	-	-	-	4,227[a]	-	-	-	-	4,149[a]	-	-	-	-	3,887[a]	-	-	-	-	-	-
Unidentified species	-	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-
ETP																				
Bottlenose dolphin	-	-	9	9	-	-	-	4	4	-	-	-	-	1	-	-	-	-	10	-
Pantropical spotted d.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Northeastern[a]	-	-	358	358	-	-	-	303	303	-	-	-	-	593	-	-	-	-	442	-
Western-southern[a]	-	-	253	253	-	-	-	428	428	-	-	-	-	310	-	-	-	-	203	-
Coastal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Spinner dolphin (? stock)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Eastern[b]	-	-	363	363	-	-	-	272	272	-	-	-	-	471	-	-	-	-	405	-
Whitebelly[b]	-	-	192	192	-	-	-	262	262	-	-	-	-	372	-	-	-	-	186	-
Central	-	-	13	13	-	-	-	2	2	-	-	-	-	-	-	-	-	-	3	-
Striped dolphin	-	-	5	5	-	-	-	11	11	-	-	-	-	3	-	-	-	-	2	-
Common dolphin (?sp.)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Northern	-	-	85	85	-	-	-	56	56	-	-	-	-	94	-	-	-	-	69	-
Central	-	-	34	34	-	-	-	222	222	-	-	-	-	203	-	-	-	-	155	-
Southern	-	-	1	1	-	-	-	9	9	-	-	-	-	46	-	-	-	-	4	-
Rough-toothed dolphin	-	-	-	-	-	-	-	27	27	-	-	-	-	-	-	-	-	-	5	-
Risso's dolphin	-	-	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Short fined pilot whales	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	1	-
Pygmy sperm whale	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Unspecified dolphins	-	-	32	32	-	-	-	39	39	-	-	-	-	40	-	-	-	-	29	-
Faroe Islands																				
Long-finned pilot whale	608[a]	-	-	-	-	588[a]	-	-	-	-	918[ac]	-	-	-	-	b	-	-	-	-
Atlantic white-sided dolphin	0[a]	-	-	-	-	255[a]	-	-	-	-	546[ac]	-	-	-	-	b	-	-	-	-
Bottlenose dolphin	-	-	-	-	-	-	-	-	-	-	6[ac]	-	-	-	-	b	-	-	-	-
Northern bottlenose whale	-	-	-	-	-	-	-	-	-	-	2[ac]	-	-	-						
France																				
Long-finned pilot whale	-	-	5[a]	-	-	-	-	1[a]	-	-	-	-	2[ab]	-	-	-	-	1	-	-
Bottlenose dolphin	-	-	7[a]	-	-	-	-	3[a]	-	-	-	-	10[ac]	-	-	-	-	12[h]	-	-
Striped dolphin	-	-	14[a]	-	-	-	-	7[a]	-	-	-	-	11[ad]	-	-	-	-	20[i]	-	-
Common dolphin (?sp.)	-	-	140[a]	-	-	-	-	193[a]	-	-	-	-	118[ae]	-	-	-	-	202	-	-
Risso's dolphin	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Harbour porpoise	-	-	8[a]	-	-	-	-	11[a]	-	-	-	-	12[af]	-	-	-	-	3	-	-
Spotted dolphin	-	-	-	-	-	-	-	-	-	-	-	-	1[ag]	-	-	-	-	-	-	-
Unidentified dolphin	-	-	18[a]	-	-	-	-	9[a]	-	-	-	-	-	-	-	-	-	-	-	-
Unid./other cetacean	-	-	1[a]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Germany																				
Harbour porpoise	-	-	3	-	-	-	-	5[a]	5[a]	-	-	-	8[b]	8[b]	-	-	-	8[c]	8[c]	-

	1999					2000					2001					2002				
	Direct		Indirect		Live	Direct		Indirect		Live	Direct		Indirect		Live	Direct		Indirect		Live
Species	Rep.	Est. total	Rep.	Est. total	Rep.	Rep.	Est. total	Rep.	Est. total	Rep.	Rep.	Est. total	Rep.	Est. total	Rep.	Rep.	Est. total	Rep.	Est. total	Rep.
Greenland																				
Narwhal	912[b]	-	-	-	-	600[bc]	-	-	-	-	a	-	-	-	-	-	-	-	-	-
White whale	493[b]	-	-	-	-	610[bc]	-	-	-	-	a	-	-	-	-	-	-	-	-	-
Harbour porpoise	1,830[b]	-	-	-	-	1,607[bc]	-	-	-	-	a	-	-	-	-	-	-	-	-	-
Long-finned pilot whale	115[b]	-	-	-	-	5[bc]	-	-	-	-	a	-	-	-	-	-	-	-	-	-
Ireland																				
Common dolphin	-	-	135[a]	-	-	-	-	3	-	-	-	-	1[b]	-	-	-	-	-	-	-
Harbour porpoise	-	-	4	-	-	-	-	-	-	-	-	-	1[b]	-	-	-	-	5[b]	-	-
White-sided dolphin	-	-	2[d]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Striped dolphin	-	-	9[c]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Risso's dolphin	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Bottlenose dolphin	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1[b]	-	-
Pilot whale	-	-	8[d]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Italy																				
Striped dolphins	-	-	15[a]	-	-	-	-	14[b]	-	-	-	-	-	-	-	-	-	-	-	-
Bottlenose dolphins	-	-	3[a]	-	-	-	-	6[b]	-	-	-	-	-	-	-	-	-	-	-	-
Common dolphins	-	-	1[a]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Undetermined delphinids	-	-	-	-	-	-	-	4[b]	-	-	-	-	-	-	-	-	-	-	-	-
Japan																				
Baird's beaked whale	62	-	-	-	-	62	-	-	-	-	62	-	-	-	-	-	-	-	-	-
Killer whale	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
False killer whale	5	-	-	-	-	8	-	-	-	-	26	-	-	-	11	-	-	-	-	-
Short-finned pilot whale[a]	394	-	-	-	2	304	-	-	-	-	342	-	-	-	2	-	-	-	-	-
Pacific white-sided dolphin	-	-	-	-	11	1	-	-	-	-	-	-	-	-	6	-	-	-	-	-
Bottlenose dolphin	658	-	-	-	91	1,426	-	-	-	-	247	-	-	-	12	-	-	-	-	-
Pantropical spotted d.	38	-	-	-	-	39	-	-	-	-	10	-	-	-	-	-	-	-	-	-
Striped dolphin	596	-	1	-	-	300	-	-	-	-	484	-	-	-	-	-	-	-	-	-
Short-beaked common d.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Risso's dolphin	489	-	-	-	-	506	-	-	-	-	474	-	1	-	3	-	-	-	-	-
Dall's porpoise	14,807	-	169	-	-	16,171	-	-	-	-	16,650	-	-	-	-	-	-	-	-	-
Finless porpoise	-	-	1	-	-	-	-	20	-	-	-	-	8	-	1	-	-	-	-	-
Stejneger's beaked whale	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-
Harbour porpoise-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Dwarf sperm whale	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Unidentified dolphin	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Unidentified species	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

	1999					2000					2001					2002				
	Direct		Indirect		Live	Direct		Indirect		Live	Direct		Indirect		Live	Direct		Indirect		Live
Species	Rep.	Est. total	Rep.	Est. total	Rep.	Rep.	Est. total	Rep.	Est. total	Rep.	Rep.	Est. total	Rep.	Est. total	Rep.	Rep.	Est. total	Rep.	Est. total	Rep.
Republic of Korea																				
Baird's beaked whale	-	-	1[ab]	-	-	-	-	-	-	-	-	-	1[b]	-	-	-	-	1[bu]	-	-
Pacific white-sided dolphin	-	-	3[bd]	-	-	-	-	4[bd]	-	-	-	-	41[bm]	-	-	-	-	53[bv]	-	-
Common dolphin	-	-	25[bh]	-	-	-	-	29[h]	-	-	-	-	62[bn]	-	-	3[b]	-	76[bw]	-	-
Risso's dolphin	-	-	2[bc]	-	-	-	-	20[i]	-	-	-	-	25[bo]	-	-	-	-	2[bx]	-	-
Harbour porpoise	-	-	1[bd]	-	-	-	-	-	-	-	-	-	87[bp]	-	-	-	-	34[by]	-	-
Finless porpoise	-	-	14[f]	-	-	-	-	-	-	-	-	-	7[br]	-	-	-	-	14[z]	-	-
Stejneger beaked whale	-	-	2[g]	-	-	-	-	1[j]	-	-	-	-	-	-	-	-	-	2[bA]	-	-
Killer whale	-	-	-	-	-	-	-	1[bd]	-	-	-	-	-	-	-	-	-	3[bd]	-	-
False killer whale	-	-	-	-	-	-	-	1[bd]	-	-	-	-	-	-	-	-	-	-	-	-
Bottlenose dolphin	-	-	-	-	-	-	-	12[k]	-	-	-	-	3[bs]	-	-	-	-	4[bB]	-	-
Dall's porpoise	-	-	-	-	-	-	-	-	-	-	-	-	2[bt]	-	-	-	-	1[ab]	-	-
Unidentified dolphin	-	-	-	-	-	-	-	27[l]	-	-	-	-	--	-	-	-	-	4[bC]	-	-
Mexico[a]																				
Vaquita	-	-	-	-	-	-	-	5[bd]	-	-	-	-	-	-	-	-	-	-	-	-
Gulf of California	-	-	-	-	-	-	-	-	-	-	-	-	2[d]	-	-	1	-	-	-	-
Bottlenose dolphin																				
Baja California Pacific	-	-	-	-	-	-	-	-	-	7[c]	-	-	-	-	-	1	-	1	-	0
	-	-	-	-	4[c]	-	-	-	-	8[c]	-	-	1	-	15	-	-	-	-	-
Gulf of Mexico	-	-	-	-	-	-	-	-	-	15[c]	-	-	-	-	-	-	-	-	-	-
Risso's dolphin	-	-	-	-	-	-	-	1[e]	-	-	-	-	--	-	-	-	-	-	-	-
Netherlands																				
Atlantic white-sided dolphin	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Harbour porpoise	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-
New Zealand																				
Long-finned pilot whale	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1[e]	-	-
Bottlenose dolphin	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Common dolphin (?sp.)	-	-	-	-	-	-	-	1	-	-	-	-	3[b]	-	-	-	-	2[d]	-	-
Hector's dolphin	-	-	5[a]	-	-	-	-	10[a]	-	-	-	-	13[c]	-	-	-	-	6[f]	-	-
Dusky dolphin	-	-	-	-	-	-	-	2	-	1	-	-	3[d]	-	-	-	-	-	-	-
Killer whale	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1[g]	-	-
Maui's dolphin	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2[h]	-	-
Oman																				
Indo-Pacific hump-backed dolphin	-	-	-	-	-	-	-	-	-	-	-	-	6	-	-	-	-	1	-	-
Bottlenose dolphin	-	-	-	-	-	-	-	6	-	-	-	-	8	-	-	-	-	1	-	-
Common dolphin	-	-	-	-	-	-	-	6	-	-	-	-	1	-	-	-	-	-	-	-
Spinner dolphin	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Dwarf sperm whale	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-
False killer whale	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Unidentified dolphin	-	-	-	-	-	-	-	1	-	-	-	-	1	-	-	-	-	1	-	-

	1999					2000					2001					2002				
	Direct		Indirect		Live	Direct		Indirect		Live	Direct		Indirect		Live	Direct		Indirect		Live
Species	Rep.	Est. total	Rep.	Est. total	Rep.	Rep.	Est. total	Rep.	Est. total	Rep.	Rep.	Est. total	Rep.	Est. total	Rep.	Rep.	Est. total	Rep.	Est. total	Rep.
Peru																				
Dusky dolphin	-	-	50[a]	-	-	-	-	12[a]	-	-	-	-	2[a]	-	-	-	-	-	-	-
Long-beaked common d.	-	-	48[a]	-	-	-	-	20[a]	-	-	-	-	7[a]	-	-	-	-	161[c]	-	-
Common dolphin	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1[c]	-	-
Bottlenose dolphin	-	-	32[a]	-	-	-	-	6[a]	-	-	-	-	1[a]	-	-	-	-	-	-	-
Burmeister's porpoise	-	-	79[a]	-	-	-	-	39[a]	-	-	-	-	14[a]	-	-	-	-	125[c]	-	-
Unidentified dolphins	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17[d]	-	-
Unspecified species	-	-	67[ab]	-	-	-	-	79[ab]	-	-	-	-	12[ab]	-	-	-	-	70[c]	-	-
South Africa																				
Indian Ocean bottlenose dolphin	-	-	41[a]	-	-	-	-	-	-	-	-	-	22	-	-	-	-	35	35	-
Common dolphin (?sp.)	-	-	11[a]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Long-beaked common dolphin	-	-	-	-	-	-	-	-	-	-	-	-	13	-	-	-	-	32	32	-
Indo-Pacific humpbacked dolphin	-	-	8[a]	-	-	-	-	-	-	-	-	-	2	-	-	-	-	9	9	-
Spinner dolphin	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Unidentified dolphins	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	-
Spain																				
Common dolphin (?sp.)	-	-	2	-	-	-	-	3	-	-	-	-	4	-	-	-	-	8	-	-
Cuvier's beaked whale	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
False killer whale	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Harbour porpoise	-	-	1	-	-	-	-	2	-	-	-	-	1	-	-	-	-	-	-	-
Bottlenose dolphin	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	7	-	-
Clymene dolphin	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Spinner dolphin	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Long-finned pilot whale	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-
Short-finned pilot whale	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Pilot whale(?)	-	-	-	-	-	-	-	2[a]	-	-	-	-	-	-	-	-	-	-	-	-
Peale’s dolphin	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Atlantic spotted dolphin	-	-	-	-	-	-	-	1	-	-	-	-	1	-	-	-	-	-	-	-
Striped dolphin	-	-	-	-	-	-	-	1	-	-	-	-	1	-	-	-	-	12	-	-
Pygmy sperm whale	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	-	-
White sided dolphin	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	2	-	-
Risso’s dolphin	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Cuvier’s beaked whale	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	-	-
Dwarf sperm whale	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Blainsville’s beaked whale	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Gervais’ beaked whale	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Killer whale	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Unidentified dolphin	-	-	4	-	-	-	-	12	-	-	-	-	1	-	-	-	-	1	-	-

	1999					2000					2001					2002				
	Direct		Indirect		Live	Direct		Indirect		Live	Direct		Indirect		Live	Direct		Indirect		Live
Species	Rep.	Est. total	Rep.	Est. total	Rep.	Rep.	Est. total	Rep.	Est. total	Rep.	Rep.	Est. total	Rep.	Est. total	Rep.	Rep.	Est. total	Rep.	Est. total	Rep.
St. Lucia																				
Short-finned pilot whale	8[a]	35[a]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pygmy killer whale	2[a]	18[a]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
False killer whale	3[a]	12[a]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Melon head whale	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bottlenose dolphin	2[b]	20[b]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Atlantic spotted dolphin	12[b]	60[b]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Short-snouted spinner dolphin	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fraser’s dolphin	1[b]	6[b]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Common dolphin	1[b]	10[b]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Striped dolphin	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sweden																				
Harbour porpoise	-	-	2	-	-	-	-	3[a]	-	-	-	-	-	-	-	-	-	3[b]	-	-
Tanzania																				
Atlantic bottlenose dolphin	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Indo-pacific bottlenose dolphin	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11	-	-
Humpback dolphin	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Turkey																				
Harbour porpoise	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20	-	-
Unidentified dolphins	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	80	-	-
UK																				
Common dolphin (?sp.)	-	-	4[a]	-	-	-	-	12[e]	-	-	-	-	72[g]	-	-	-	-	-	-	-
Short-beaked common dolphin	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	37[h]		
Harbour porpoise	-	-	19[b]	-	-	-	-	34[f]	-	-	-	-	11	-	-	-	-	29[i]	-	-
Bottlenose dolphin	-	-	1[c]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Striped dolphin	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-
Unidentified delphinid	-	-	1[d]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
USA																				
White whale	238[b]	-	-	-	-	240[q]	-	-	-	-	463[f]	-	-	-	-	394[z]	-	-	-	-
Killer whale	-	-	2[g]	4[g]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Atlantic pilot whale (*Globicephala* sp.)	-	-	3[h]	371[h]	-	-	-	3[r]	58[r]	-	-	-	-	-	-	-	-	-	-	-
Pacific pilot whale	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Atlantic white-sided dolphin	-	-	4[i]	69[i]	-	-	-	1[s]	26[s]	-	-	-	-	-	-	-	-	-	-	-
Pacific white-sided dolphin	-	-	0	0	-	-	-	2[d]	5[d]	-	-	-	-	-	-	-	-	1[y]	5[y]	-
Atlantic Bottlenose dolphin	-	-	7[j]	115[j]	-	-	-	5[t]	338[t]		-	-	-	-	-	-	-	-	-	-
Pacific Bottlenose dolphin	-	-	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pacific Short-beaked common	-	-	34[k]	191[k]	-	-	-	23[d]	75[d]	-	-	-	-	-	-	-	-	9[y]	49[y]	-
Pacific Long-beaked common dolphin	-	-	1[l]	8[l]	-	-	-	2[d]	9[d]	-	-	-	-	-	-	-	-	4[y]	15[y]	-

	1999					2000					2001					2002				
	Direct		Indirect		Live	Direct		Indirect		Live	Direct		Indirect		Live	Direct		Indirect		Live
Species	Rep.	Est. total	Rep.	Est. total	Rep.	Rep.	Est. total	Rep.	Est. total	Rep.	Rep.	Est. total	Rep.	Est. total	Rep.	Rep.	Est. total	Rep.	Est. total	Rep.
USA continued																				
Atlantic Common dolphin (sp.)	-	-	3^{m}	195^{m}	-	-	-	6^{u}	273^{u}	-	-	-	-	-	-	-	-	-	-	-
Pacific Common dolphin (sp.)	-	-	2^{k}	2^{k}	-	-	-	-	3^{e}	-	-	-	-	-	-	-	-	-	3^{x}	-
Northern right whale dolphin	-	-	3^{k}	17^{k}	-	-	-	11^{d}	47^{d}	-	-	-	-	-	-	-	-	3^{y}	15^{y}	-
Atlantic Risso's dolphin	-	-	1^{n}	22^{n}	-	-	-	2^{v}	56^{v}	-	-	-	-	-	-	-	-	-	-	-
Pacific Risso's dolphin	-	-	0	0	-	-	-	2^{d}	7^{d}	-	-	-	-	-	-	-	-	-	-	-
Atlantic harbour porpoise	-	-	36^{o}	342^{o}	-	-	-	16^{w}	528^{w}	-	-	-	-	-	-	-	-	-	-	-
Pacific harbour porpoise	-	-	28^{p}	133^{p}	-	-	-	7^{c}	26^{c}	-	-	-	-	-	-	-	-	-	16^{x}	-
Dall's porpoise	-	-	4^{a}	5^{a}	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Beaked whales	-	-	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Unidentified species	-	-	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-

Argentina: In the following notes the estimated catch is given, followed by observed catch in brackets: (a) Buenos Aires coast - gillnet; (b) Tierra del Fuego - gillnet; (c) Figure composed as follows:<100 (34) Tierra del Fuego – gillnet + 141-112 (69) Ria Gallegos – gillnet; (d) figure composed as follows: 31 Tierra del Fuego – gillnet + 6 Santa Cruz; (e) Buenos Aires coast – gillnet; (f) Santa Cruz coast – gillnet; (g) Ria Gallegos and La Angelina: (Santa Cruz) – gillnet; (h) Buenos Aires coast – gillnet-drifnet; (i) Buenos Aires coast; (j) Santa Cruz coast – gillnet; (k) Tierra del Fuego – gillnet; (l) South Atlantic – mid water trawls.

Australia: In the following notes the estimated catch is given, followed by observed catch in brackets: (a) figure composed as follows: 3 (0) Gold Coast, Queensland + 0 (1) Shark net, SE Australia, New South Wales+ 1 (1) gillnet, SE Australia, New South Wales; (b) figure composed as follows: 3 (0) Gold Coast, Queensland + ? (6) SE Australia, New South Wales; (c) figure composed as follows: 2 (0) Gold Coast, Queensland + 1 (1) SE Australia, New South Wales; (d) figure composed as follows: 1 (0) Sunshine Coast, Queensland + 2 (0) Gold Coast, Queensland + 1 (0) Gill net fishery, Gulf of Carpentaria, Queensland + 1 (0) Mackay, Queensland + 0 (2) probable entanglement SA coastline + 0 (1) euthanased, SA coastline + 1 (0) salmon farm net, Southern Australia; (e) figure composed as follows: 3 (0) Sunshine Coast, Queensland + 2 (0) Gold Coast, Queensland + 0 (2) SE Australia; (f) figure composed as follows: 0 (1) Sunshine |Coast, Queensland + 0 (1) Cairrns, Queensland; (g) Gulf of Carpentaria, Queensland; (h) SE Australia (NSW), net entanglement; (i) figure composed as follows: 2 (2) QDPI SCP net, Gold Coast, Queensland + 5 (5) QDPI SCP net, Sunshine Coast, Queensland + 1 (?) Entangled in salmonid farm net, SE TAS; (j) probable entanglement, SA coastline; (k) figure composed as follows: 1 (1) Shark control net, Sydney, NSW + 6 (6) QDPI SCP net, Gold Coast, QLD + 4 (4) QDPI SCP net, Sunshine Coast, QLD + 2 (2) Probable entanglement SA coastline + 2 (?) SE TAS; (l) figure composed as follows: 1 (1) NT PWC + 1 (1) QDPI SCP net, Mackay, QLD + 4 (4) QDPI SCP net, Sunshine Coast, QLD.

Brazil: Note: The catches in 1999 and 2000 are pers. comm. Salvatore Siciliano. In the following notes the estimated catch is given, followed by the observed catch in brackets: (a) 178 [1986-1999] (1) from northern Rio de Janeiro + 24 [Aug. 1998 – May 2000] (10) from central São Paulo + (3) from northern Rio Grande do Sul + (3) from northern Rio de Janeiro (pers. comm. A.P. Di Beneditto and R. Ramos) + 729 (64) from Rio Grande, southern Rio Grande do Sul (SC/55/SM1); (b) 141 (4) from northern Rio de Janeiro + (4) from Northern Espírito Santo + (2) from Paraíba + (7) from Northern Rio de Janeiro State (pers. comm . A.P. Di Beneditto and R. Ramos); (c) caught in central Sao Paulo – gillnet; (d) figures composed as follows: >850 (55) caught in southern Brazil – gillnet (this is only a rough estimate based on extrapolation, for the whole fleet. Data exists from only nine boats from a fleet of about 140-150 [see Sechi et al., 1997]) + 646 (48) from Rio Grande, southern Rio Grande do Sul (SC/55/SM1); (e) figure composed as follows: 3 direct and 3 indirect from Cananeia Estuary, SP – gillnet + 2 from Northern Rio de Janeiro – gillnet (pers. comm. A.P. Di Beneditto and R. Ramos) + 3 from NE Brazil – gillnet; (f) caught from central Sao Paulo; (g) caught from central Amazon; (h) figure composed as follows: 1 northern Rio Grande do Sul, gillnets + 18 northern, gillnets; (i) northern; (j) central and high Amazon reports of more than 50 dolphins being caught during October/\November to be used as bait to catch one species of catfish for export to Colombia and Peru; (k) figure composed as follows: 39 from Rio Grande do Sul – gillnet + 12 from São Paulo – gillnet + 9 from Santa Catarina – gillnet; (l) figure composed as follows: 13 from Bahia + 5 from Ceará – trawl net (2); gillnet (3); (m) Bahia; (n) from Rio Grande do Norte – gillnet.

Canada: (a) no information; (b) figure composed as follows: 451 High Arctic + 108 Hudson; (c) figure from Nunavut - figures from Northwest Territories – Beaufort Sea not available at time of report.

Chile: Figures are taken from SC/51/SM17 and are a mixture of direct and incidental catches. (a) stranded (III), harpoon wounds + witness evidence of a directed take - parts muscle and blubber removed; (b) stranded with multiple cut marks and flukes severed.

Denmark: (a) SC/54/SM31 - bycatch is overestimated, as the effect of the use of pingers has not been taken into account.

ETP: (a) includes prorated unidentified spotted and coastal spotted; (b) includes prorated unidentified spinner.

Faroe Islands: (a) pers. comm. Daniel Pike, Scientific Secretary, NAMMCO; (b) no information; (c) these figures are assumed to be direct catches as it was not specified in the communication from Daniel Pike.

France: (a) includes those found stranded with marks indicating that they had been most probably caught in fishing gear. Data are provided by the CRMM-La Rochelle, France; (b) figure composed as follows: 1 Atlantic + 1 Mediterranean; (c) figure composed as follows: 2 English Channel + 7 Atlantic + 1 Mediterranean; (d) figure composed as follows: 7 Atlantic + 4 Mediterranean; (e) figure composed as follows: 1 English Channel + 117 Atlantic; (f) figure composed as follows: 3 English Channel + 9 Atlantic (g) Caribbean; (h) figure composed as follows: 10 Atlantic + 2 Mediterranean; (i) figure composed as follows: 13 Atlantic + 7 Mediterranean.

Germany: (a) figure composed as follows: 3 from Schleswig-Holstein, Baltic Sea - gillnet + 2 from Mecklenburg-Prepommerania, Baltic Sea – gillnet; (b) figure composed as follows: 5 from Schleswig-Holstein, Baltic Sea - gillnet + 3 from Mecklenburg-Prepommerania, Baltic Sea – gillnet; (c) figure composed as follows: 1 from North Sea + 4 from Schleswig-Holstein, Baltic Sea + 3 from Mecklenburg-Prepommerania, Baltic Sea – gillnet.

Greenland: (a) no information; (b) pers. comm. Daniel Pike, Scientific Secretary, NAMMCO; (c) these figures are assumed to be direct catches as it was not specified in the communication.

Ireland: (a) bycatch of 1 determined from post-mortem + 7 incidentally caught in surface gillnet; (b) bycatch determined from post-mortems; (c) 1 incidentally caught in surface gillnet + 8 pelagic fishery for albacore. Diversification trials with alternative tuna fishing techniques including the uce of remote sensing technology. EU Contract 98/010 BIM; (d) diversification trials with alternative tuna fishing techniques including the uce of remote sensing technology. EU Contract 98/010 BIM.

Italy: (a) Centro Studi Cetacei. 2001. Cetacei spiaggiati lungo le coste italiana. XIV. Rendiconto 1999 (Mammalia). Atti Soc. It. Nat. Museo civ. Stor. Nat. Milano, 14/2000(II):353-365; (b) Centro Studi Cetacei. 2002. Cetacei spiaggiati lungo le coste italiana. XV. Rendiconto 2000 (Mammalia). Atti Soc. It. Nat. Museo civ. Stor. Nat. Milano, 142/2001(II):251-264.

Japan: (a) northern and southern forms; (b) no information.

Korea: (a) drift gillnet; (b) East Sea; (c) set net; (d) gillnet; (e) figures composed as follows: 20 set net, 5 gillnet; (f) figures composed as follows: 1 East Sea gillnet, 13 Yellow Sea stow nets; (g) figure composed as follows: 1 gillnet + 1 drift gillnet; (h) figure composed as follows: East Sea – 2 trap net + 8 purse seine + 7 gillnet + 12 set net; (i) figure composed as follows: East Sea – 2 gillnet + 17 set net + 1 trap net; (j) East Sea – Set net. (k) Figure composed as follows: East Sea – 1 Gillnet + 1 Set net + South Sea – 10 Purse seine; (l) figure composed as follows: East Sea –1 purse seine + 18 gillnet + 3 set net + 4 trap net + South Sea – 1 set net; (m) figure composed as follows: 21 gillnet + 14 set net + 3 trap net + 3 unidentified; (n) figure composed as follows: 18 purse seine + 1 long line + 8 gillnet + 32 set net + 3 trap net; (o) figure composed as follows: 4 purse seine + 5 gillnet + 4 set net + 1 long line + 2 trap net + 9 unidentified; (p) figure composed as follows: 1 long line + 57 gillnet + 29 set net; (r) figures composed as follows: 5 gillnet + 2 set net; (s) figures composed as follows: 1gillnet + 1 set net + 1 trawl; (t) figures composed as follows: 1 gillnet + 1 set net; (u) drifted; (v) figure composed as follows: 2 long line + 6 driftnet + 11 gillnet + 31 set net + 1 trap net + 2 drifted; (w) figure composed as follows: 4 long line + 3 drift gillnet + 11 gillnet + 47 set net + 2 squid zigging + 2 drifted + 4 unidentified + 3; (x) figure composed as follows: 1 gillnet + 1 unidentified; (y) figure composed as follows: 8 drift gillnet + 8 gillnet + 14 set net + 4 drifted; (z) figure composed as follows: 1 South Sea - unidentified + 3 East Sea – gillnet + 1 East Sea - set net + 2 East Sea – drifted + 7 Yellow Sea – unidentified; (A) figure composed as follows: 1 gillnet + 1 drifted; (B) figure composed as follows: 2 trawl + 2 drifted; (C) figure composed as follows: 2 drift gillnet + 1 gillnet + 1 drifted.

Mexico: (a) see the ETP table for catches taken in the Eastern Tropical Pacific. They are not included here; (b) captured in the Gulf of California; (c) permits issued by SEMARNAP. The animals are being kept in captivity at recreational facilities; (d) gillnet; (e) Pacific long-line.

New Zealand: (a) South Island # beachcast; (b) gillnet/trawl; (c) figure composed as follows: gillnet - 3 North Island, West Coast + 6 South Island, West Coast + 4 South Island, East Coast; (d) trawl; (e) bottom long line; (f) figure composed as follows: gillnet – 3 South Island, West Coast + 3 South Island, East Coast; (g) long line - Bay of Plenty; (h) gillnet – North Island, West Coast.

Oman: There is no standardized observer or survey programme and number of records are directly related to beach survey effort, which was lower in 1999 and 2002 than in 2000 and 2001. Records are taken from the Oman Cetacean Database, maintained by the Oman Whale and Dolphin Research Group. Records all result from examination of carcasses encountered during beach or small boat survey showing clear evidence of fisheries interaction (rope or net on body, clear rope or net burns/scars, flensed carcasses).

Peru: Figures are a mixture of direct and incidental catches. (a) figures are taken from SC/54/SM10. All catches taken from Table 1 have been tabled as incidental because it is not clear which were direct and which were incidental; (b) mostly meat samples; (c) taken from Salverrry port - pers. comm. Dr. K Van Waerebeek (Source: Peruvian Centre for Cetacean Research (CEPEC) and Asociacion ProDelphinus); (d) taken from San Jose between 14 January 2002 and 27 March 2002. pers. comm. Dr. K Van Waerebeek (Source: Peruvian Centre for Cetacean Research (CEPEC) and Asociacion ProDelphinus).

South Africa: (a) pers. comm P. Best.

Spain: (a) probably pilot whale-ship strike. [The numbers for 2000 have been updated according with the information given in this year's Progress Report].

St. Lucia: All caught in the Carribbean Sea. (a) harpoon gun; (b) harpoon gun/hand harpoon.

Sweden: (a) figure composed as follows: 1 Baltic Sea - gillnet + 2 Swedish Skagerrak Sea (1 gillnet + 1 trawl); (b) figure composed as follows: 1 Baltic Sea - gillnet + 2 Skagerrak and Kattegat Seaa, and Öresund - fishing gear.

Turkey: (d) SC/55/SM23 - incidental catches by Turkish trawlers in the Romanian Exclusive Economic Zone.

UK: (a) bycatch diagnosed at necropsy (England); (b) figure composed as follows: 9 diagnosed at necropsy (England and Wales), 4 gillnet fisheries (England), 1 gillnet (E. Scotland), 3 trawl (W. Scotland), 2 diagnosed at necropsy (W. Scotland); (c) illegal salmon net (Moray Firth); (d) gillnet fishery (England); (e) figure composed as follows: 10 England & Wales - stranded/diagnosed at necropsy + 2 Celtic Sea – observed bycatch in set net fisheries; (f) figure composed as follows: 8 England & Wales - stranded/diagnosed at necropsy + 12 North Sea - observed bycatch in set net fisheries + 14 Celtic Sea - observed bycatch in set net fisheries; (g) pelagic trawling; (h) 29 UK – stranded /necropsy + 8 Channel – pair trawl fishery; (i) figure composed as follows: 24 UK – stranded/necropsy + 5 skate tangle net fishery, North Sea.

USA: The reported catch columns include catches reported by observer programs, from interviews with fishermen and incidental reports (e.g. stranded animals determined to have died in nets). There are no live captures to report. All information is taken from published USA National Marine Fisheries Service Annual Marine Mammal Stock Assessment Reports (SAR) unless otherwise indicated. Stranded animals are not included. In the following notes the estimated catch is given, followed by observed catch in brackets: (a) SC/54/ProgRep USA – figure composed as follows: 4(3) Alaska groundfish fisheries (trawl, longline and pot) + 1(1) Washington, Oregon and California at-sea processing groundfish trawl fishery; (b) pers. comm. D.P. DeMaster – does not include figures for Cook Inlet; (c) halibut/angel shark set gillnet fishery – Monterey Bay (SC/55/ProgRep USA); (d) swordfish/thresher shark drift gillnet fishery (SC/55/ProgRep USA); (e) set gillnet fishery – non-Monterey strata: Southern California, Ventura, Channel Is., and Morro Bay) (SC/53/SM9); (f) SC/54/ProgRep USA - figure includes 51 struck and lost – does not include figures for Cook Inlet; (g) SC/54/ProgRep USA - Alaska groundfish fisheries (trawl, longline and pot); (h) SC/54/ProgRep USA - figures composed as follows: 228(1) NW Atlantic – N. Atlantic bottom trawl + 49(1) NW and Mid-Atlantic – squid, mack., butt. trawl + 94(1) Mid-Atlantic – pelagic longline; (i) SC/54/ProgRep USA - NW Atlantic – NE multispecies sink gillnet; (j) SC/54/ProgRep USA - figures composed as follows: 63(3) Mid-Atlantic coastal sink gillnet + 52(4) central Florida shark gillnet; (k) SC/54/ProgRep USA - California/Oregon/Washington swordfish/thresher shark drift gillnet fishery; (l) SC/54/ProgRep USA - California swordfish/thresher shark drift gillnet fishery; (m) SC/54/ProgRep USA - figures composed as follows: 146(2) NW Atlantic, NE multispecies sink gillnet + 49(1) NW and Mid-Atlantic, squid, mack, butt., trawl; (n) SC/54/ProgRep USA - NW and Mid – Atlantic pelagic longline (serious injury); (o) SC/54/ProgRep USA - figures composed as follows: 270(14) NW Atlantic, NE multispecies sink gillnet + 53(3) Mid-Atlantic coastal sink gillnet + 19(19) NW and Mid-Atlantic, NMFS/NER records (gillnet); (p) SC/54/ProgRep USA - central California angel shark/halibut and other species large mesh (>3,5") set gillnet fishery; (q) SC/55/ProgRep USA – figure includes 28 struck and lost – does not include figures for Cook Inlet; (r) SC/55/ProgRep USA – NW Atlantic and Mid Atlantic - figure composed as follows: 34(2) So. New England *Illex* squid trawl + 24(1) pelagic longline (s) SC/55/ProgRep USA – NW Atlantic, northeast sink gillnet; (t) SC/55/ProgRep USA – figure composed as follows: coastal stock - 202(3) Mid-Atlantic, coastal gillnet + 4(1) Florida coast, south Atlantic shark gillnet fishery + offshore stock – 132(1) NW Atlantic, northeast sink gillnet; (u) SC/55/ProgRep USA – NW and Mid-Atlantic, So. New England *Loligo* squid trawl; (v) SC/55/ProgRep USA – NW and Mid-Atlantic - figure composed as follows: 41(1) pelagic longline + 15(1) northeast sink gillnet; (w) SC/55/ProgRep USA – Gulf of Maine/Bay of Fundy and Mid-Atlantic - figure composed as follows: 507(15) northeast sink gillnet + 21(1) Mid-Atlantic coastal gillnet; (x) SC/55/SM3 – California set gillnet fishery; (y) SC/55/SM3 – California drift gillnet fishery; (z) SC/55/ProgRep USA – figure includes 30 struck and lost – does not include figures for Cook Inlet.

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U.S. Marine Mammal Stock Assessment Reports are available at the following web site: *http://www.nmfs.noaa.gov/prot_res/PR2/Stock_Assessment_Program/sars.html*

ANNEX XIV

CONSERVATION PLAN FOR CETACEANS IN THE BLACK SEA

ACCOBAMS Capacity Building Initiatives to Promote Cetacean Research and Conservation in Black Sea Countries: Progress Report

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Since 2001, ACCOBAMS has organised a series of capacity building initiatives aimed at developing expertise on cetacean research and conservation in Black Sea countries, and at encouraging collaboration among researchers and institutes from the ACCOBAMS region.

In 2003 these initiatives have included the following activities:

1) Training course on photo-identification methods for Black Sea researchers

held at
Tethys Research Institute field station, Island of Kalamos, Greece (July 2003)
Balaklava, Ukraine (October 2003)

organized by
Alexei Birkun / Brema Laboratory, Ukraine
Giovanni Bearzi, Simone Panigada, Stefano Agazzi / Tethys Research Institute, Italy co-sponsored by Nikon Italy
with the financial support from the Société Monégasque de l'Electricité et du Gaz de Monaco

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TRAINERS
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BACKGROUND
Photo-identification is considered to be one of the least intrusive methods for gathering knowledge of cetaceans. It is a technique for identifying individual animals using photographs of distinctive natural markings. Knowing which animal was observed where, when, with whom and under which environmental conditions will provide the necessary knowledge for researchers and managers to protect cetaceans populations.

At present the southern Mediterranean and Black Sea Countries are currently not covered by photoidentification studies, and therefore they are not participating in the Europhlukes project. Within the Europhlukes project there is no available funding for field work or training of researchers, which will be necessary to involve these countries in the project. However, the participation of other countries to the project, in particular from the Black Sea and North Africa would result in a great improvement of the project itself, by widening its geographical coverage to the entire Mediterranean and Black Sea areas, and therefore providing information on cetacean populations living in these areas.

The adoption of photo-identification methods to improve understanding of Black Sea cetaceans has been
further recommended by the IWC Sub-Committee on Small Cetaceans (Berlin, 2003) and represents Implementation Priority #11 of the ACCOBAMS agreement.

At its 1st Meeting in Tunis (3-5 October, 2002) the ACCOBAMS Scientific Committee stressed that a pilot project should be dedicated to those groups in which infrastructures exist, and provide researchers who are already collecting field data with the necessary expertise and instrumentation to perform fully independent photo-identification surveys.

Therefore, an intensive, 9-day training course on cetacean photo-identification methods was held in July 2003 to create expertise among Black Sea researchers on this powerful - yet unintrusive – research approach and promote the use of cetacean photo-identification techniques in the Black Sea, where the application of this kind of research method is still undeveloped.

RATIONALE FOR DOING THE TRAINING

The Black Sea's marine mammal fauna is limited, owing to inherent features of this basin, including the high degree of geographical isolation of the sea, its low water salinity and the large amount of anoxic waters. Three species of cetaceans – the harbour porpoise (*Phocoena phocoena*), the short-beaked common dolphin (*Delphinus delphis*) and the common bottlenose dolphin (*Tursiops truncatus*) – crown the trophic pyramid of the Black Sea as top predators. All three species, drastically affected by commercial killing that continued until the early 1980s, are exposed to ongoing anthropogenic threats which may cause the increased mortality and morbidity, disturbance, habitat deterioration and depletion of food resources.

The future of common bottlenose dolphin population, assumed to be the smallest of the Black Sea cetacean populations, is of particular concern regionally and internationally. This population is protected by a long list of legislative instruments, but its conservation status has not been assessed. This largely depends on the scarcity of reliable scientific data allowing to make credible population estimates. In particular, very little is known about the distribution, movement patterns and social ecology of Black Sea
bottlenose dolphins. Systematic sighting surveys covering coastal waters during various seasons coupled
with individual photo-identification of free-ranging animals are among eligible approaches that could be employed to address the current lack of information.

Although some research teams in Ukraine (Brema Laboratory, Simferopol) and Russia (Institute of Ecology and Evolution, Moscow) have been conducting boat and aerial cetacean surveys in the northern and north-eastern parts of the Black Sea, no specialist trained in photo-identification techniques and analyses exist in those countries. Both teams mentioned above are interested in the improvement of their professional abilities and application of photo-identification methodology in the context of joint research activities in the Kerch Strait (between Russia and Ukraine) and adjacent areas off Crimea (Ukraine) and Caucasus (Russia). The teams are already equipped with motor boats, binoculars, GPS, computers, etc. However, they do not possess cameras, lenses and software suitable for photoidentification studies.

In the spirit of capacity building of all Black Sea countries, as a first step, two scientists from Georgia will
be trained especially in photo-identification methodology in addition to scientists from Russia and Ukraine. A follow up in Georgia will be organized in 2004.

PHASE 1 - INTENSIVE TRAINING IN KALAMOS, GREECE

A 9-day intensive training course was held at the Ionian Dolphin Project field station, on the island of

Kalamos, Greece, in July 2003.
Since 1993 the Tethys Research Institute (Italy) has been conducting a research project on the social ecology of common bottlenose dolphins (*Tursiops truncatus*) and short-beaked common dolphins (*Delphinus delphis*) living in the eastern Ionian Sea. Photo-identification has been the most important research method used by this study, and has produced remarkable results.

The training course has been based on the following daily activities:
In the morning, all participants go out at sea to do photo-identification surveys and dolphin data collection from a 5.80 m inflatable craft with fiberglass keel, powered by a 80HP, 4-stroke Yamaha outboard engine.
In the afternoon, participants are given seminars on photo-identification data collection and analysis, and
are directly involved in the cataloguing and matching of dorsal fin slides taken in the field.
All participants are involved in the collection of photo-identification data at sea. During photoidentification sessions all participants are trained in all phases of data collection, including boat driving and individual photo-identification of common bottlenose dolphins and short-beaked common dolphins.
After the surveys, participants check the quality of digital photographs collected in the field by themselves, and assess their ability and problems. This results in a day-by-day improvement of photoidentification skills.
In addition, by working side by side with four experienced Tethys researchers, participants acquire essential background for field studies on dolphins and learn how to run their own photo-identification project.

PHASE 2 - FOLLOW-UP IN UKRAINE AND RUSSIA
In August 2003, just after the training in Kalamos, the Ukrainian team (3 persons) and the Russian team (3 persons) have collected photo-identification data in the Ukrainian and Russian portions of the Kerch Strait (890 km2), situated between the Black and the Azov Seas. According to the results of two linetransect aerial surveys, carried out by the same teams in this area in August 2001 and August 2002, common bottlenose dolphins inhabit those waters in the mid and late summer. These animals may be moving from the Kerch Strait to the Black Sea in autumn and vice versa in spring.

To confirm this hypothesis, and increase knowledge on local dolphins, the Ukrainian and Russian teams
performed photo-identification surveys in October 2003 within two geographically separated Black Seaareas off the Crimean (Ukraine) and Caucasian (Russia) coasts. The Ukrainian study area is situated south of the Crimean peninsula, between Cape Sarych and Cape Khersones. The Russian study area encompasses the coastline between Gelendzhik and Tsmesskaya Bays. Both areas are known to be populated (or intensively visited) by common bottlenose dolphins in fall and early winter.

A Tethys trainer has joined the Russian and Ukrainian teams in October 2003 for in situ consultations and examination of the 'home-work' fulfilled by the trainees. Members of both the Ukrainian and Russian team have been given specific instructions for the evaluation, filing, matching, analysis and interpretation of their own photo-identification data. Data collected by both teams in the Kerch Strait in August and off southern Crimea and northern Caucasus in October have been compared and analysed. For the first time, a database of Black Sea cetacean photo-identification images is established, that will contribute to the Europhlukes project.

LONG-TERM BENEFITS IN TERMS OF CETACEAN CONSERVATION
• A regular monitoring of cetaceans by means of individual photo-identification methods has been initiated concurrently in two Black Sea countries, Russia and Ukraine;
• For the first time, a collection of cetacean images has been established for common bottlenose dolphins sighted in the Strait of Kerch and along the coasts of the Crimean Peninsula and Russian Caucasus;

• The presence of resident communities of common bottlenose dolphins is being assessed, together with their distribution, individual movement patterns, habitat use, and exchange of individuals with adjacent communities;
• An assessment of local dolphin abundance off southern Crimea and Gelendzhik area, Caucasus, is being done based on photo-identification data;
• Areas of particular importance for common bottlenose dolphins in the northern and north-eastern Black Sea are being identified, which will allow to propose measures for their conservation based on data provided by photo-identification studies;
• Photos of short-beaked common dolphins and harbour porpoises occasionally sighted in the area are filed to assess the potential of photo-identification techniques to study these species, and to promote further development of photo-identification;
• Trained Russian and Ukrainian teams will contribute to spreading the use of photo-identification techniques to other Black Sea countries.

2) Individual capacity building on cetacean research and conservation

In July 2003 Dr. Konstantin Michailov from the Institute of Fisheries and Aquaculture in Varna, Bulgaria, has been trained by Tethys Research Institute personnel for two weeks at the Ionian Dolphin Project field station.

Seminars included the following topics:
• Coastal dolphins in the Mediterranean Sea: the possible reasons behind their decline
• Individual photo-identification: field methods and data analysis
• Survey methods: an introduction
• Threats to cetaceans, worldwide
• Cetacean conservation: rationale, strategies and tools
• Cetacean perception: a key to the design of conservation strategies
• Communicating for results: how to divulge your knowledge
• A career in marine mammal science
• How to prepare a scientific poster
• Creating a dolphin research and conservation project from scratch
• Video sessions

Practical activities included:
• Daily surveys at sea: navigation and data collection on common bottlenose dolphins, short-beaked common dolphins and other marine animals
• Understanding and practicing research materials and methods: survey, photo-identification, behavioural sampling, respiration sampling, fish-scale sampling
• Field data downloading, transcription and entering
• Preliminary data analysis
• Slide matching for photo-identification purposes
• Reading of selected scientific literature
• Proposal evaluation and presentation
• Developing presentation skills
• Self evaluation

FEEDBACK RECEIVED: Letter by Konstantin Michailov to the ACCOBAMS Secretariat

Dear Mrs Van Klaveren,
with reference to the training course (1-14.07.2003) on Kalamos island I would like to thank the Secretariat and you personally for giving me the opportunity to attend this workshop on dolphin research and conservation.

The time spent in Episkopi I consider as fruitful and exciting experience. Although designed to give general knowledge in cetology, the training, with the concise and absorbing lectures of Dr G. Bearzi, lovely videos, lively seminars and intense field work with the involvement of all participants in the research, in my humble opinion, turned to be school giving excellent and expertly presented knowledge in the theory of cetacean conservation and management as well as essential background for field studies.

I find very useful for possible future research on cetaceans in the Black Sea especially the methods of photo-identification, respiration patterns, behavioral sampling, remote biopsy sampling, etc. They could be tested for the conditions of the basin and probably applied for assessing the distribution and relative size of the dolphin populations inhabiting the Bulgarian coast (or better the whole sea), their feeding habits, genetic and toxicologic analyses, etc.

I appreciated very much the presentations, hospitality and help of all 4 Tethys researchers, the Technical protocol for field data collection for the Black Sea compiled by Dr G. Bearzi and the photo-identification form. The beautiful sights from the inflatable, the staying with the dolphins, the peculiar caves and the numerous inlets add to the magnificent impressions.

I hope that the knowledge obtained in such trainings could promote further research on dolphin conservation and management in the Black Sea and thus will contribute to the implementation of ACCOBAMS by the Black Sea countries and Bulgaria in particular.

Best regards

K. Mikhailov
Institute of Fisheries and Aquaculture, Varna, Bulgaria

ANNEX XV

CONSERVATION PLAN FOR CETACEANS IN THE BLACK SEA

Towards a Conservation Plan for Black Sea Cetaceans: Turkey's suggestion

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As responding to the recommendation in the above article, Turkey, as one of the riparian countries of the Black Sea, would like to make some suggestions.

1. Management
Action 1.1 MITIGATION OF BYCATCH

Recommendations: Socio-economical study on the Black Sea fishing communities should be carried out to provide better and more pratical solution for the fishermen. Establish one or two Marine Protected Areas are also of concern as bycaught species.

2. Capacity building
Action 2.1 LONG-TERM CAPACITY BUILDING
Recommendations: an inter-university course on cetaceans research and management can be organized at Istanbul University with assistance from TUDAV, a NGO recognized by UN system.

3. Education Awareness
Action 3.1 ACCESS TO INFORMATION
Background: Internet is still not commonly used in public schools in the Black Sea region.
Recommendations: an education Packet (booklet, poster, sticker, etc.) on cetaceans in the Black Sea will be prepared in 5 black Sea languages as well as in English and distributed to elementary school children.

4. Research and Monitoring
Action 4.1 BASIC CETACEAN SURVEY / IDENTIFICATION OF CETACEAN HOT SPOTS
Recommendations: (We know that bycatch is one of the greatest threats to Black Sea cetaceans, we do not have enough information to elaborate any management plan in a realistic and feasible way. Therefore…) We recommend that the level of bycatch as well as fishing power investigated more in detail to identify critical habitats for cetaceans in the Black Sea.

ANNEX XVI

CONSERVATION PLAN FOR COMMON DOLPHINS IN THE MEDITERRANEAN SEA

Conservation of short-beaked common dolphins in the Mediterranean Sea: *Progress Report 2003*

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This project, conducted in the context of ACCOBAMS Implementation Priorities #4 and #7 and co-ordinated by the Tethys Research Institute, has started in May 2003 and will end in April 2005.

Funding for the year 2003 (first phase of the project) was provided by ACCOBAMS (12,000 Euro), WDCS - The Whale and Dolphin Conservation Society (9,900 Euro) and ASMS - Marine Mammal Protection (4,000 Euro). This has covered about a half of the total budget for this project (48,600 Euro).

By the time this progress report is being written (October 2003), the project has produced the following output:

1) Review article

A short-beaked common dolphin expert group coordinated by Tethys, featuring representative Mediterranean researchers and international conservation experts, has worked intensively to complete a review on the ecology, status and conservation of the Mediterranean short-beaked common dolphin subpopulation. Such a review has resulted in a scientific article that has been submitted to Mammal Review. The article has been published in September 2003. This represents the first comprehensive attempt to assess the status of short-beaked common dolphins in the region.

> Bearzi, G., Reeves, R.R., Notarbartolo di Sciara, G., Politi, E., Cañadas, A., Frantzis, A. & Mussi, B. 2003. Ecology, status and conservation of short-beaked common dolphins (*Delphinus delphis*) in the Mediterranean Sea. Mammal Review 33(3):224-252.

The severity and impact of the main threats affecting short-beaked common dolphins in the Mediterranean have been evaluated, with the aim of prioritising action. Factors implicated in the species' decline include 1) prey depletion; 2) xenobiotic contamination; 3) direct takes and bycatch; and 4) environmental fluctuations and global changes. Priorities for action have been identified, and a series of six research initiatives have been proposed that should be implemented to increase understanding of the species' past and ongoing trends. Finally, conservation measures have been suggested that may mitigate the existing threats.

2) IUCN Red Listing

Largely based on the review outlined in item (1), a proposal has been drafted and submitted to the IUCN Cetacean Specialist Group to list the Mediterranean subpopulation of short-beaked common dolphins as **Endangered** in the IUCN Red List of Threatened Animals, based on criterion A2, which refers to a ≥50% decline in abundance over the last three generations, the causes of which 'may not have ceased *or* may not be understood *or* may not be reversible'. After a lengthy discussion the proposal has been endorsed by the Cetacean Specialist Group and afterwards by IUCN headquarters (see http://www.redlist.org). This is the first Mediterranean cetacean subpopulation ever to be included in the IUCN Red Lists. Having

Bearzi, G. 2003. Conservation of short-beaked common dolphins in the Mediterranean Sea: *Progress Report 2003*. Document presented at the 2nd Meeting of the ACCOBAMS Scientific Committee. Istanbul, Turkey, 20-22 November, 2003.

Mediterranean short-beaked common dolphins listed as Endangered is expected to enhance the value of ACCOBAMS actions targeted to this species and benefit the ongoing conservation efforts.

3) COMMON DOLPHIN LITERATURE

A large body of literature information on common dolphins (*Delphinus* sp.) in the Mediterranean and elsewhere has been obtained, filed and evaluated. All the relevant articles have been included in Tethys' "Venice Marine Mammmal Library" at the Venice Natural History Museum and can be consulted there by the interested public.

4) COMMON DOLPHIN CONSERVATION PLAN

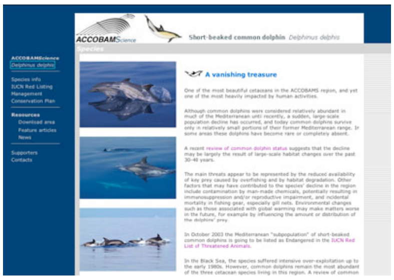
The work done so far provides a solid background to develop a short-beaked common dolphin Conservation Plan that will identify the most appropriate research and conservation measures to be conducted in key Mediterranean areas. One of the goals of such a Plan will be to prioritise action to develop and implement pilot conservation and management projects in areas containing critical habitat for the species. The Conservation Plan (to be released by December 2004) will be coordinated by Tethys and will benefit from consultancy by Randall R. Reeves, Giuseppe Notarbartolo di Sciara and other international experts.

5) COMMON DOLPHIN DATA ANALYSIS

Research has been started to process and analyse the data collected around the island of Kalamos over the last decade, with the ultimate goal of evaluating community trends of short-beaked common dolphins living in this eastern Ionian Sea area. So far, analyses have focused on dolphin abundance and population dynamics, based on the dataset that has been assembled by the Tethys Research Institute between 1993-2002, during 758 survey days and 20,417 km of total effort, resulting in 412 common dolphin sightings. Photo-identification archives suitable for individual identification, including 16,693 short-beaked common dolphins photographs, were matched and the resulting databases are producing information that is being used to assess habitat use and site fidelity by the animals.

6) WEB SITE

An web site dedicated to the conservation of short-beaked common dolphins in the Mediterranean has been created. The site has been developed as a section of the ACCOBAMScience web site. It currently includes information on common dolphin conservation and management, the text submitted to have the Mediterranean subpopulation included in the IUCN Red List of Threatened Animals, a distribution map, a comprehensive list of relevant literature, a media section with articles appeared in the press, popular articles, and contact information.



7) TARGETING THE MEDIA


Più riserve nel Mediterraneo

Santuario dei cetacei: la sfida è iniziata

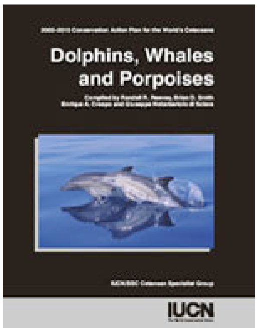

L'ALLARME / Nella lista delle specie a rischio

Mare inquinato e senza cibo I delfini stanno scomparendo


Gli esperti: manca il cibo, delfini a rischio nell'Adriatico

Following an extensive press campaign jointly organized in September 2003 by ACCOBAMS, Tethys Research Institute, Whale and Dolphin Conservation Society and ASMS - Marine Mammal Protection, a number of articles have appeared on the European press, featuring the decline of short-beaked common dolphins and the conservation initiatives undertaken by ACCOBAMS.

8) OTHER RESULTS



Mediterranean common dolphins are portrayed in the front cover of "Dolphins, Whales and Porpoises: 2002-2010 Conservation Action Plan for the World's Cetaceans", released by IUCN in May 2003. Mediterranean common dolphins and given much conservation emphasis in inner sections of the Plan.

Mediterranean short-beaked common dolphins have appeared on the front cover of the IUCN newsletter "Species" (June 2003, Issue 39).

The WDCS Magazine (September 2003, Issue 28) has featured an article by G. Bearzi and R.R. Reeves on the decline of short-beaked common dolphins in the Mediterranean Sea.

Common dolphin conservation problems and ACCOBAMS initiatives to protect them have been featured in a large number of web sites, including:

http://www.naturanetwork.it/s_focus_0093.asp
http://animali.tiscali.it/altriamici/articoli/200309/08/delfini_a_rischio.html
http://www.wdcs.org/dan/publishing.nsf/webnews/0417246BAA43209480256D8E00310A2B
http://www.walfang.org/dan/de-news.nsf/(webnews)/186D481B7A41919AC1256DA200341936
http://www.newton.rcs.it/PrimoPiano/News/2003/09_Settembre/15/Delfino.shtml
http://www.asms-swiss.org/deutsch/presse/common_dolphin_26_08_03.shtml
http://www.wdcs-de.org/dan/de-publishing.nsf/0/74a4e7f1f334d7f0c1256d8d0058ccdd?OpenDocument
http://www.numedi.it/rubriche/somteli.html
http://www.vglobale.it/NewsRoom/index.php?News=133
http://notizie.tiscali.it/feeds/CRO/200309/06/2003-09-06_3152653.html
http://netzwerk-regenbogen.de/delphinusd030827.html
http://www.petnews.it/settembre/pets107.htm
http://www.ansa.it/ambiente/notizie/notiziari/natura/20030906173332680699.html
http://www.ansa.it/ambiente/notizie/notiziari/natura/20030906123832680395.html

ANNEX XVII

CONSERVATION PLAN FOR BOTTLENOSE DOLPHINS IN THE MEDITERRANEAN SEA

Towards a conservation Plan for Bottlenose Dolphins in the Mediterranean Sea

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INTRODUCTION

A Conservation Plan delineates reasonable actions necessary to protect a depleted species. This draft Conservation Plan for common bottlenose dolphins (*Tursiops truncatus*; hereafter "bottlenose dolphins") is intended as a first step towards the design of a comprehensive Plan for the protection of the species.

No information has been included here on the level of effort that should be invested in any of the aspects of the programme, or on the related costs, as this is an exercise that should be done in the context of the final Conservation Plan.

Emphasis has been placed on those approaches that carry no risk to the animals and that can be predicted to yield useful results with some certainty. In addition, there is more focus on those actions that can effectively be developed in the region by taking advantage of the existing expertise.

Most of the actions listed here are likely to benefit not only bottlenose dolphins, but also other cetacean species living in Mediterranean coastal waters, particularly the endangered short-beaked common dolphins (*Delphinus delphis*). It is recommended that those actions which can benefit both bottlenose and common dolphins be developed and implemented together.

This draft Conservation Plan may be subject to modifications as dictated by input from ACCOBAMS Scientific Committee members and other experts, new findings, changes in species status and completion of implementation tasks.

A NOTE ON IMPERFECT KNOWLEDGE

No comprehensive effort has ever been made to summarize the presently-available information on the ecology, status and conservation of Mediterranean bottlenose dolphins at a basin-wide scale. As a consequence, prioritizing action aimed at the protection of this population is a difficult task.

Most actions listed here are based on the threats highlighted by Notarbartolo di Sciara *et al*. (2002). These threats - including intentional and direct takes, prey depletion, contamination by xenobiotic compounds, accidental takes in fishery activities and disturbance - are based on both real and perceived impact on the Mediterranean population. It should be considered as a possibility that threats being more visible or easy to record are given more consideration than those having a higher impact but being subtle and difficult to record or relate to dolphin status. This draft Conservation Plan attempts to compensate for this bias by including actions aimed at the assessment of some potentially important but scarcely visible threats.

A major hindrance to determining the status of coastal dolphins in the Mediterranean is the fragmentary character of the literature, which is composed almost exclusively of so-called "grey literature", including unpublished reports, academic theses or dissertations, conference proceedings and other non-refereed publications. Although some of these studies are of high scientific quality and have been long running, only a small proportion of the relevant available data has been published in peer-reviewed scientific journals. This situation makes it difficult to evaluate what is known even for many of the areas where
focused research on the species has been carried out.

It is recommended that ACCOBAMS stimulates a comprehensive effort by a group of experts, aimed at reviewing the existing information (currently composed largely of grey literature) and at prioritising research and conservation actions based on the best available knowledge. Such a review effort should include a list of science-based recommendations, and should indicate where the available data are sufficient to adopt management strategies without delay, or where information gaps should be filled by focused research. Whenever the available data are insufficient it is recommended that management be based on the precautionary principle and that imperfect information does not represent an excuse to delay action indefinitely.

A NOTE ON MARINE PROTECTED AREAS

The establishment of MPAs is one of the provisions of the ACCOBAMS Agreement. As far as bottlenose dolphins are concerned, the aim is to ensure that the proposed MPAs make conservation sense. In a marine environment such as the Mediterranean, where human impact is so pervasive, even though it is illegal to deliberately kill cetaceans, MPAs are needed to give the dolphins a greater protection and relief from human encroachment. At least in these areas, set aside for cetacean conservation, cetacean status considerations must have precedence over human activities.

Effective MPAs for cetacean conservation should be designed based on an understanding of cetacean movements and extent of critical habitat for the population. Bottlenose dolphin communities in the Mediterranean are good conservation targets for MPAs, as they are known to show very high levels of site fidelity (although some individuals may travel over long distances, e.g. see Dhermain *et al*., 1999). This means that a properly designed network of MPAs may represent a solid strategy to protect these coastal and largely "resident" animals, as long as the creation of a few small MPAs is no excuse for forgetting other management goals within the wider region.

MPAs can provide an ideal framework to conduct robust scientific investigations and ecosystem studies, and combine them with socio-economic analyses and other management-oriented assessments. In MPAs for cetaceans dangerous fishing practices such as driftnets should be forbidden, and fishermen should not be allowed to use acoustics to exclude dolphins from their habitat. Due consideration should be given to the maintenance of prey mass and quality needed to sustain a population of cetaceans as large as we can possibly infer from our knowledge or hypothesis of pre-decline levels. Finally, disturbance should be monitored and maintained to the minimum.

Although the creation of MPA networks has been listed among the actions presented in this draft Conservation Plan, this clearly represents a management decision which stands on a higher level, because MPAs targeted to bottlenose dolphin conservation can (and should) incorporate in their management plans many of the actions proposed here. This does not mean that comprehensive sets of conservation actions can only be implemented within MPAs. Indeed, limiting management efforts within a few existing or planned MPAs would represent a conservation failure.

MANAGEMENT AND RESEARCH OBJECTIVES

The following management priorities are relevant to the conservation of bottlenose dolphins in the Mediterranean.

- Maintain the present levels of abundance and facilitate recovery by mitigating threats and preserving bottlenose dolphin habitats
- Attempt to restore population sizes to pristine, pre-decline levels, comparing present abundance with past abundance, based on a qualitative evaluation of the available information in the historical literature
- Ensure that sufficient gene flow is maintained across the Mediterranean basin, after an assessment is made of the degree of dispersal and isolation of the bottlenose dolphin communities living in the basin

- Identify areas where conflict with fisheries or other human-related impacts are particularly acute, and design local and basin-wide mitigation strategies aimed at reducing human-induced mortality and controlling excessive fishing that may directly or indirectly deplete dolphin prey
- Implement with urgency research and monitoring programmes providing scientific information which is essential to inform management, such as:

  o Investigate the present distribution and movements (e.g. inshore/offshore) of Mediterranean bottlenose dolphins, provide a rough estimate of the present abundance at the regional scale, and obtain precise estimates in key Mediterranean habitats

  o Investigate and rank the current threats in order of detrimental impact, both at a regional and local level

  o Support capacity building initiatives and facilitate access to information, particularly in the southern and eastern portions of the Mediterranean basin, to encourage the development of coastal dolphin studies in those areas.

PROPOSED ACTIONS

The 21 actions sketched below are divided into four broad categories: Management, Capacity building, Education & Awareness, Research & Monitoring. All categories are equally important and they will have to be addressed simultaneously.

Although this draft Conservation Plan has been presented as a series of separate actions, there is a clear need for integrating all this into a comprehensive management plan. In some cases, sets of different actions can be particularly effective if conducted in the context of a single effort. For instance, educating fishermen, promoting alternatives to fishing and reducing bycatch and intentional killings may be all sides of the same die. This would also include the monitoring of bycatch events to assess if the action brings positive results.

Many more actions could be listed, which may contribute directly or indirectly to Mediterranean bottlenose dolphin conservation. Here, only those being both feasible and expected to bring timely positive results have been chosen.

It is recognized that some of the actions outlined below are already underway. They were included here to highlight their importance and their need for continued support.

1. MANAGEMENT

ACTION 1.1.
INVESTIGATE OPERATIONAL INTERACTIONS WITH FISHERIES AND PROMOTE MEASURES TO REDUCE CONFLICT

Rationale/Background: Operational interactions between coastal dolphins and fisheries are known to give rise to acute conflict in some Mediterranean areas, where competition for resources (either real or perceived), depredation of fishing gear and/or fishing gear damage often result in dolphin killings (Reeves *et al*., 2001; Bearzi, 2002; Notarbartolo di Sciara & Bearzi, 2002).

Recommended action: A workshop has been organized by ICRAM in 2001 specifically to address this problem, which has produced a series of recommendations (Reeves *et al*., 2001; see Annex 2). Efforts by ACCOBAMS should be aimed at implementing those recommendations through the co-ordination of an expert group committed with the development of appropriate strategies. Data on operational interactions collected by means of fishermen interviews should be designed in a way that allows biased perceptions and/or harsh feelings to be taken into account (Bearzi, 2002). The "commensal" relationship between the
biologist and the fishermen represents yet another important bias in fishery research. For instance, it has been suggested that direct observations of depredation by marine mammals should not be conducted from fishing platforms, but only from independent platforms (Smith 1995). Research focusing on the animals should be conducted parallel to research focusing on the fisheries. Moreover, research should not only focus on the immediate area and season of harvesting, as this represents an especially constraining practice when considering the food web interactions with marine mammals, with their frequently large annual movements and behavioural flexibility. Finally, ecosystem components other that the abundance of commercially important prey should be considered, as improving our understanding of the dynamics of food web interactions is far more important than investigating consumption rates (Smith 1995).

ACTION 1.2.
INVESTIGATE THE IMPACT OF BYCATCH AND ENACT MITIGATION STRATEGIES

Rationale/Background: Fishery bycatch is considered as a major threat to many cetacean populations and it is known to represent a source of mortality for bottlenose dolphins in several portions of the Mediterranean basin (IWC, 1994; Bearzi, 2002). So far, little has been accomplished to mitigate this problem.

Recommended action: Efforts by ACCOBAMS should be (and currently are) aimed at identifying areas or fisheries that are immediate problems in terms of depleting bottlenose dolphin groups, as compared with areas/fisheries where the incidence of entanglement of this species is known/likely to be low enough (or conversely, the dolphin abundance is high enough) as to make bycatch a relatively unimportant threat. Bycatch rates and dynamics should be assessed as precisely as possible in problem areas, in order to develop area-specific mitigation strategies. An effort is underway by ACCOBAMS to secure funds from the EC to achieve the tasks described here.

ACTION 1.3.
DESIGN A NETWORK OF MARINE PROTECTED AREAS TO PROTECT KEY COASTAL DOLPHINS HABITATS AND FACILITATE THE RECOVERY OF DOLPHIN PREY

Rationale/Background: MPAs represent effective means of mitigating some of the threats affecting coastal dolphins. Success depends on factors including appropriate management and the capacity to match critical habitat preferences with the boundaries of the MPA. MPAs may restore ecosystem functioning and benefit marine food webs by providing shelter to threatened marine species, thus contributing to the recovery of depleted dolphin prey (Agardy, 1997; Roberts *et al*., 2001). MPAs are also amenable to the promotion of respectful dolphin-watching, which may allow ex-fishermen or

part-time fishermen to increase their income with dolphins instead of fishing, and most importantly begin to involve them in the conservation process.
Recommended action: Protection to critical bottlenose dolphin habitats should be ensured by means of a network of MPAs designed to increase or safeguard habitat quality, reduce the chances of unintentional harm (e.g. bycatch), provide shelter and better habitat conditions for dolphin prey, reduce noise levels and direct disturbance, etc. As noted above, MPAs may incorporate in their management plans several of the actions proposed here.

ACTION 1.4.
PROMOTE ALTERNATIVES TO FISHING AND MEASURES TO REDUCE OVERFISHING

Rationale/Background: Overfishing is having a major impact on the Mediterranean ecosystems (e.g. see Briand, 2000) and the resulting food web changes are likely to represent one of the most important threats to coastal dolphins (Bearzi, 2002; Bearzi *et al.*, 2003; Bearzi & Notarbartolo di Sciara, 2003).
Recommended action: Manage fishing effort in key bottlenose dolphin habitats. Support the ongoing efforts by the EU to promote measures aimed at the conversion of the European Mediterranean fishing fleet and at reducing its impact on marine food webs; promote and support the extension of similar fishery policies to non-European riparian States. Responsible whale watching may be promoted in some areas - articularly in MPAs (see above) - as an economically-sound alternative to fishing. Support efforts to control or reduce the issuing of new fishing licences. Promote the adoption and implementation of the Pew Marine Conservation Fellows' Action Statement for Fisheries Conservation (see Annex 3).

ACTION 1.5.
MITIGATE THE IMPACT OF DOLPHIN WATCHING AND DISTURBANCE FROM PLEASURE BOATING

Rationale/Background: The impact of dolphin watching - either commercial or amateur - on bottlenose dolphins is controversial and only in a few cases clear detrimental effects have been recorded (IFAW, Tethys Research Institute & Europe Conservation, 1995). Still, intensive and unregulated dolphin watching activities may result in disruption of natural behaviour.
Recommended action: Identify critical habitats where bottlenose dolphins are likely to be negatively affected by intensive and unregulated dolphin watching activities. Promote public awareness and the adoption of voluntary codes of conduct to mitigate the impact of irresponsible dolphin watching and disturbance from pleasure boating (also see Action 3.1.). Provide information to the relevant authorities to promote mitigation measures. Implement the measures resulting from the discussion of ACCOBAMS Document SC2/Inf.1 (ACCOBAMS, 2003).

2. CAPACITY BUILDING[1]

ACTION 2.1.
PROFESSIONAL TRAINING IN THE FIELD

Rationale/Background: Involving inexperienced dolphin researchers in professionally-run field research projects is a powerful way of promoting appropriate methods for data collection and developing collaboration networks. A hands-on approach is the most likely to produce lasting benefits, as information gathered through direct personal experience acquired in the field is unlikely to be forgotten or overlooked.
Recommended action: Involve students and researchers from the ACCOBAMS region in field training courses focusing on coastal dolphins, run by professional organizations working in the Mediterranean. Similar actions have been conducted by ACCOBAMS in 2002 and 2003, which have brought positive results. Training should be directed primarily at students and researchers from countries where access to information is difficult, and opportunities to get involved in dolphin research projects are scarce.

ACTION 2.2.
PROFESSIONAL TRAINING IN CETACEAN RESEARCH AND CONSERVATION

Rationale/Background: Opportunities to get professional training in dolphin research techniques and learn about cetacean conservation strategies are still scarce in the Mediterranean region. University courses on cetaceans are extremely rare, and good training opportunities are available only in a few countries. Consequently, many young scientists cannot rely on appropriate training for their professional growth, which prevents the development of cetacean research and conservation initiatives in large portions of the Agreement Area.
Recommended action: Promote and support University courses and other capacity building courses on cetacean conservation strategies and research techniques in the ACCOBAMS region.

ACTION 2.3.
FACILITATION OF ADVANCED DATA ANALYSIS AND PUBLICATION

Rationale/Background: Some researchers and postgraduate students have accumulated sizable datasets containing various field and laboratory data. Those data are often in need of accurate treatment and would benefit from analysis including modern approaches in applied statistics and mathematical modelling. However, expertise to perform such analyses is mostly very limited and concentrated in a few high-profile laboratories and Universities. As a consequence, the publication of results is often delayed indefinitely. In addition, language problems and/or limited scientific writing skills in English may contribute to hampering data publishing for many researchers working in portions of the ACCOBAMS region. This sometimes results in important datasets being accumulated but never becoming available to the larger scientific community. For researchers from several Mediterranean countries it is currently difficult to acquire the necessary expertise, owing to funding limitations and social, political or other constraints. This action aims at providing worthy Mediterranean researchers and students with follow-up and expert supervision to facilitate scientific data analysis and promote data publication.
Recommended action: Identify and promote ways of allowing selected individual scientists to get specific training and expert supervision for advanced analysis and statistical data treatment. The comprehensive analysis of valuable existing datasets assembled by several independent research groups over the last decade should be promoted and supported to improve our current understanding of bottlenose dolphins and other cetacean species. ACCOBAMS should ensure that dolphin data that are relevant for conservation purposes be given appropriate consideration, and that the process of data analysis and publishing be facilitated through appropriate mechanisms.

[1]Rather than being exclusively targeted to bottlenose dolphins, the actions outlined here are expected to benefit the larger field of cetacean research. As such, they should be considered and treated as far-reaching conservation actions which can ultimately benefit several cetacean species.

ACTION 2.4.
SUPPORT LITERATURE COLLECTIONS AND FACILITATE ACCESS TO SCIENTIFIC LITERATURE

Rationale/Background: As emphasised by the ACCOBAMS Implementation Priority Action #16, "one of the greatest hindrances to the region-wide development of a cetacean science tradition - a fundamental prerequisite to conservation and, ultimately, to the fulfilment of the purposes of the Agreement - is the diffused current unavailability of up-to-date specialised literature in most Range States' scientific and academic environments" (see Annex 1). Gaining access to scientific literature on cetaceans is still exceedingly difficult in most Mediterranean countries. Lack of access to appropriate documentation hinders learning and makes publication in refereed journals more difficult.
Recommended action: Facilitate access to the relevant literature throughout the ACCOBAMS region. First, existing collections of cetacean literature with focus on the Mediterranean should be supported. Second, exchange of literature should be facilitated by all means by providing specialized libraries with the necessary support to operate as a source of continuously updated information for researchers working in the Agreement Area. The systematic collection of scientific articles should be promoted and public access to library files ensured (e.g. by making available online as pdf files large collections of articles and by enabling keyword-based searches). This action may ultimately result in the creation of significant cetacean libraries throughout the Agreement range, which may serve as sources for local scientists and interested students.

3. EDUCATION & AWARENESS

ACTION 3.1.
PRODUCE EDUCATIONAL MATERIALS TO PROMOTE COASTAL DOLPHIN CONSERVATION

Rationale/Background: Even if appropriate legislation exists to protect marine mammals, in some Mediterranean areas it may be difficult to mitigate threats due to the present lack of education and public awareness. Long-term education campaigns on the need to protect cetaceans have brought positive results even in the absence of legislation or implementation. Such a "bottom-up" approach is highly desirable whenever legal ("top-down") initiatives do not suffice or wherever environmental public awareness is poor.
Recommended action: Production of selected science-based, effective educational material to promote the conservation of coastal dolphins, either locally or at the Mediterranean level. Educational materials should be primarily aimed at complementing and supporting ACCOBAMS strategies and priority actions, and should have clear conservation (rather than self-promotion) goals.

ACTION 3.2.
WEB SITE ON MEDITERRANEAN BOTTLENOSE DOLPHINS

Rationale/Background: Internet access is now widespread in the Mediterranean region. This provides ACCOBAMS with an appropriate tool to facilitate access to information regarding ongoing initiatives aimed at bottlenose dolphin conservation. A dedicated web site would allow the dissemination of literature, scientific information and recommendations to the concerned public.
Recommended action: Design and management of a dedicated web site on Mediterranean bottlenose dolphins, with a focus on their conservation problems in the region. The site may include the final bottlenose dolphin Conservation Plan, a download section, feature articles, selected links, contact data and other information. This initiative is similar to the one developed for short-beaked common dolphins (see http://www.accobams.org/Delphinus_delphis/index.htm).

4. RESEARCH & MONITORING

ACTION 4.1.
LINKING CAUSES AND EFFECTS IN SELECTED STUDY AREAS: INVESTIGATE DOLPHIN-FISHERIES INTERACTIONS IN THE MEDITERRANEAN FROM AN ECOLOGICAL PERSPECTIVE

Rationale/Background: Elucidation of ecosystem dynamics, and specifically the possible role of prey depletion and regime shifts as factors contributing to the decline of coastal dolphins in the Mediterranean, is an important but challenging area of research. Investigations of the spatial and temporal variability in Mediterranean fish stocks, when correlated with dolphin abundance and movements, could be informative, as could output obtained from ecosystem models (e.g. Christensen & Pauly, 1992) and analyses of food-web dynamics. Longitudinal research in "natural laboratories" (*sensu* Wells, 1991) may allow to identify threats and assess their impact based on an understanding of ecosystem functioning and needs by the animals. The depletion of dolphin prey caused by overfishing, either directly or through the "fishing down" effect (Pauly *et al*., 1998, 2002), is a major source of concern. The impact on cetaceans
may be hidden and difficult to monitor owing to complex ecosystem dynamics (Bearzi, 2002). The understanding of predator-prey interactions and ecosystem functioning represents an essential conservation means, which may allow to evaluate the potential effects of food web interactions between marine mammals and man. Ecosystem modelling has been proposed in recent years as a viable tool for understanding the complex ecological interactions between cetaceans, fisheries and other ecosystem components (*e.g.*, Smith, 1995; Earle, 1996). If given proper development and implementation, software tools such as "Ecopath-Ecosim" (Christensen & Pauly, 1992) may greatly benefit our understanding of ecosystem dynamics and the future management of coastal dolphin populations.
Recommended action: Promote and support focused investigations by expert research groups aimed at linking causes and effects in study areas representing ideal natural laboratories, to investigate ecosystem and dolphin population dynamics and assess the impact of fishing and habitat degradation. Priority should be given to research in study areas which represent good candidates to allow specific investigations on cause-effect relationships, and provide means of evaluating the effectiveness of measures to protect the animals. Promote the development and application of ecosystem modelling as a tool to explore the dynamics of selected ecosystems and assess the impact of the local fishing pressure on coastal dolphins. Studies should consider both the direct and indirect impacts of fishing (e.g. food-web changes, mechanical destruction of sea floor) on bottlenose dolphin communities. Important information on cetacean diet and nutritional conditions may be obtained from lipid and isotope studies performed on biopsy samples. For further recommendations see Bearzi & Notarbartolo di Sciara (2003).

ACTION 4.2.
DESIGN AND CONDUCT SURVEYS AIMED AT ASSESSING AND COMPARING BOTTLENOSE DOLPHIN ABUNDANCE

Rationale/Background: At present, almost no information is available on bottlenose dolphin abundance and population parameters in the Mediterranean basin, and reliable abundance estimates have been obtained only in tiny portions of the basin. The present lack of quantitative information prevents to evaluate population status and trends, thus hampering conservation efforts. Field surveys are clearly needed to determine the current distribution and abundance of bottlenose dolphins in the Mediterranean, particularly off the entire North African coastline and in eastern Mediterranean areas where little quantitative information exists.
Recommended action: Surveys should be designed to identify hotspots of occurrence that can be accorded priority for intensive research and management. Standard methods such as vessel-based and/or aerial line transect surveys should be used so that results can be compared over time and from one region to another. Aerial surveys should be preferred to ship surveys whenever dolphin density is known (or expected) to be low. Line transect surveys should be designed to obtain low CV estimates

in key bottlenose dolphin habitats, in a way that trends in abundance can be monitored. Abundance estimates in key areas should be repeated on a seasonal and/or annual basis to obtain information on yearly and seasonal habitat use, as well as on population dynamics and trends. In large areas where no information is available, surveys with comparatively looser transect grids may be conducted to obtain less precise abundance estimates, which would be still useful to gain insight into bottlenose dolphin numbers and habitat use.

ACTION 4.3.
ASSESS STOCK DISCRETENESS AND LEVELS OF GENE FLOW IN THE BASIN

Rationale/Background: The risks of local or regional extinction from stochastic processes can be reduced by preserving as much genetic diversity as possible (Shaffer, 1987; Lande, 1988). However, information on the genetic characteristics of Mediterranean bottlenose dolphins is still limited. From preliminary genetic studies carried out by Ada Natoli and colleagues at the University of Durham, U.K., bottlenose dolphins in the Mediterranean appear fragmented into small isolated populations, especially in enclosed waters such as the Adriatic Sea. Limited gene flow is observed between the eastern and western parts of the basin, but further investigations are needed to determine the degree of population differentiation and gene flow on a smaller geographic scale (A. Natoli, pers. comm.)
Recommended action: A better understanding is needed of the genetic characteristics of Mediterranean bottlenose dolphins. Promote the collection and analysis of tissue samples in those areas that have not been investigated so far, particularly in the southern Adriatic Sea, Tyrrhenian Sea, Sicily Channel, North African coasts, eastern Mediterranean, and in the areas adjacent to the Gibraltar Strait and to the Turkish Straits System. Increase the number of samples from those areas where only a few samples are available at the moment (Ionian Sea, northern Adriatic Sea). The collection of a minimum of 30 samples per subarea is deemed appropriate to conduct genetic analyses aimed at investigating stock structure (A. Natoli, pers. comm.). Samples should be collected for genetic and other analyses from stranded and bycaught animals, or from free-ranging animals with minimal intrusiveness (e.g. by means of "scrub" sampling, a minimally intrusive technique to collect sloughing skin, Harlin *et al*., 1999). Biopsy samples should be collected, stored and analyzed in the context of a pan-Mediterranean effort. International agreements and initiatives aimed to facilitate the import and export of samples should be considered.

ACTION 4.4.
PROMOTE THE MONITORING OF CETACEAN STRANDINGS AND THE COLLECTION OF BIOLOGICAL MATERIAL FROM STRANDED ANIMALS THROUGH CO-ORDINATED NETWORKS

Rationale/Background: The collection of information on stranded cetaceans obtained through coordinated stranding networks, together with inspections of dolphin carcasses and analyses of tissue samples allow to obtain essential information on cetacean species composition, pathologies, contaminant levels and the likely threats affecting the animals at sea. For instance, high levels of PCBs in Mediterranean dolphins, compared to levels in dolphins from other areas (Fossi *et al*., 2003; Aguilar *et al.*, 2002), represent a major concern, as toxic contaminants such as PCBs, that accumulate in dolphin tissues through food-chain biomagnification, are known to cause immune-suppression and reproductive impairment in mammals. Stranding networks are relatively well developed in some Mediterranean countries, but they are less developed or lacking in other countries. Therefore, the present situation makes it difficult to compare stranding data recorded across the region, or to evaluate information from cetacean tissue samples collected at a basin scale.
Recommended action: Cross-country collaboration should be facilitated and capacity building actions supported to encourage the development of stranding networks in countries where monitoring of cetacean strandings is lacking. In addition, the improvement of existing networks should be promoted.
This will require effective communication and exchange of information at the regional level. Rigorous investigations should be conducted to assess the scale of bycatch and intentional killings, as well as ship collisions and other causes of mortality, based on evidence provided by stranding data. Pollutant levels in stranded/bycaught bottlenose dolphins should be monitored throughout the region. Analyses

should be conducted to identify regional differences in exposure and relate contaminant levels to bottlenose dolphin
status.

ACTION 4.5.
ASSESS THE IMPACT OF ACOUSTIC DETERRENT DEVICES (ADDs)[2]

Rationale/Background: Acoustic deterrent devices (ADDs) are becoming increasingly popular in many Mediterranean areas as a means to deter coastal dolphins (mostly bottlenose dolphins but also shortbeaked
ommon dolphins) from approaching and depredating fishing gear or catches (Reeves *et al*., 2001). The short- and long-term impact of exposure to ADD sound, possibly resulting in permanent habitat loss, has never been investigated.
Recommended action: Identify problem areas and monitor changes in behaviour and habitat use by bottlenose dolphins, which may result from the presence of ADDs. Assess to what extent the widespread adoption of ADDs may result in temporary or permanent habitat loss for the dolphins, and investigate the occurrence of other detrimental impact on the animals. Conclusions and recommendations in the ICRAM workshop report on interactions between dolphins and fisheries in the Mediterranean (Reeves *et al*., 2001, see Annex 2) should be taken into account.

ACTION 4.6.
ASSESS THE IMPACT OF HIGH INTENSITY NOISE, INCLUDING AIRGUNS, MILITARY SONARS, ILLEGAL FISHING WITH DYNAMITE AND MILITARY ARTILLERY EXERCISES IN BOTTLENOSE DOLPHIN CRITICAL HABITATS

Rationale/Background: Growing evidence exists that impulsive sounds can threaten cetaceans (e.g. Richardson *et al*., 1995; Frantzis, 1998; Gisiner, 1998; Jasny, 1999; Jepson *et al*., 2003). So far, little specific research has been conducted to monitor the potential impact of high-intensity noise on Mediterranean bottlenose dolphins, although their coastal distribution often overlaps with high-intensity noise sources.
Recommended action: Identify problem areas and assess the impact on coastal dolphins of high intensity noise. Determine whether impulsive noise affects bottlenose dolphin distribution and habitat use, and investigate other possible detrimental effects on the animals. The occurrence of impact on the animals which may be relatively subtle/hidden and therefore difficult to measure (e.g. behavioural disruption, stress etc.) should be evaluated carefully (Richardson & Würsig, 1995).

ACTION 4.7.
PROMOTE COLLABORATIVE PHOTO-IDENTIFICATION STUDIES

Rationale/Background: Individual photo-identification from natural marks has been performed successfully on bottlenose dolphins since the 1970s (Würsig & Würsig, 1977). If studies are conducted over many years photo-identification datasets form the basis for longitudinal studies of birth and death, as well as range and habitat use. Collaborative photo-identification studies represent an effective way of investigating cetacean movements across areas. Recently, the EC funded Europhlukes programme (http://www.europhlukes.net) has been providing the necessary framework for the development of collaborations among researchers involved in cetacean photo-identification projects across Europe. However, this effort should be extended to non-European countries in the ACCOBAMS region. Recommended action: Promote collaborative photo-identification studies aimed at investigating bottlenose dolphin population parameters, habitat use, the relationship between coastal

[2]See recommendations in the IUCN Project #49, pag. 78 in Reeves *et al*., 2003 ("Develop and test approaches to reduce conflict between bottlenose dolphins and small-scale fisheries in the Mediterranean Sea").

and pelagic groups, and long-range movement patterns. In European countries much of this is expected to result from the Europhlukes project itself, as long as appropriate encouragement is given to cross-country collaborative projects. In non-European Mediterranean countries ACCOBAMS should promote the adoption of photo-identification methods through appropriate capacity building initiatives similar to those that are currently targeting the Black Sea (Bearzi, 2003; and see http://www.accobams.org/ index_science.htm).

ACTION 4.8.
DEFINE THE STATE OF THE ART OF BOTTLENOSE DOLPHIN RESEARCH IN THE MEDITERRANEAN

Rationale/Background: In recent years Mediterranean field studies focusing on coastal bottlenose dolphin communities have proliferated, particularly off the northern coasts of the basin. Many research groups have assembled sizable datasets. However, only a portion of the resulting information has been made accessible to the scientific community at large, and peer-reviewed publications remain scarce. This is even more true for research conducted off portions of the eastern and southern Mediterranean coasts, where the results may be published in languages other than English or French and therefore be poorly accessible to many. In addition, several research groups still have to publish in a comprehensive way the results of their work. Consequently, it is difficult to assess what is being done in the Mediterranean and what reliable results can be used to assess the ecology and status of bottlenose dolphins living in the region. For large portions of the Mediterranean information seems to be extremely limited or entirely lacking, although some data may exist which are currently out of reach for most investigators.
Recommended action: Identification of areas where bottlenose dolphin studies are underway, and creation of a directory of Mediterranean scientists and organizations focusing on this species. This information can be partly derived from the ACCOBAMS online database (see http://www.accobams.org/index_science.htm) and from reports by Regional Coordinators. Still, a more focused effort will be needed to make the directory detailed, uniform and comprehensive, and to collect additional data on bottlenose dolphins from the concerned groups. The resulting information may be mapped in order to highlight the present distribution of research effort, and provide insight into the distribution of the species. This is expected to result in a better understanding of the effort needed to fill in the present information gaps. In addition, this action may contribute to the understanding of the main perceived threats affecting the dolphins.

ACTION 4.9.
WORKSHOP ON MEDITERRANEAN BOTTLENOSE DOLPHINS

Rationale/Background: Facilitating exchange of information among scientists and groups working on Mediterranean coastal dolphins is of foremost importance. First, the existing knowledge and expertise may provide insight into management priorities (e.g. help identifying problem areas and assessing the relative importance of threats affecting the species in different portions of the basin). Second, chances to exchange views on dolphins living in different sub-regions can encourage the development of collaborative projects.
Recommended action: As a first step, key actors should be identified and information on their ongoing activities be made available to the wider scientific community (see Action 4.8.). Consequently, a workshop on Mediterranean bottlenose dolphins may be organized to facilitate exchange of information among researchers working in the region. Such a workshop should encourage individual researchers with significant expertise to join working groups, which may focus on items such as bottlenose dolphin distribution, past and present abundance, ongoing threats and perceived conservation priorities. This effort may result in a volume that incorporates work presented at the workshop, as well as reports from working groups. A considerable organization and editing/review work will be necessary to meet the purposes of this action. Success will depend upon wide participation by representative researchers from all Mediterranean countries. Financial support should be provided to facilitate participation by scientists operating in economically depressed regions.

Efforts by selected workshop participants should be coordinated according to a strict agenda, to ensure that this activity will produce useful output.

ACTION 4.10.
INVESTIGATE THE "SHIFTING BASELINES" EFFECT AND STIMULATE A REVIEW ARTICLE ON MEDITERRANEAN BOTTLENOSE DOLPHIN CONSERVATION

Rationale/Background: How many bottlenose dolphins were there in the Mediterranean in the past? Was the species more abundant 50 years ago? How can we relate the current abundance estimates to historical times for which no quantitative data exist? Have our baselines shifted (*sensu* Pauly, 1995) owing to lack of historical information? Although quantitative information in the old literature may be poor and/or unreliable, review work based on bibliographic searches in old literature archives may greatly enhance our capability to frame the present dolphin status into a context, as shown by a few recent exercises focusing on Mediterranean common dolphins (Bearzi *et al*., 2003) and northern Adriatic bottlenose dolphins (Bearzi *et al*., In review). Review articles describing the past and present status and trends of a cetacean species at the regional level can be extremely useful in providing the background needed for the development of conservation strategies. Unfortunately, the present highly dispersed information on bottlenose dolphins does not allow one to draw satisfactory conclusions on their status, and on the factors that have determined such a status.
Recommended action: Review the past status of bottlenose dolphins based on bibliographic searches aimed to determine the real and perceived abundance of the species in the Mediterranean prior to human exploitation and habitat degradation. Searches should be conducted by a team of experienced scientists in libraries holding significant collections of historical literature on cetaceans and related issues (e.g. cetacean stranding records, culling, bounties for dolphin killings, landings in fish markets, bycatch data,
museum collections etc.) Such work may shed light on historical bottlenose dolphin abundance and provide insight into the threats that may have affected the species in the past. The preparation of a review paper on the status and conservation of Mediterranean bottlenose dolphins, similar to the articles published on Mediterranean fin whales (*Balaenoptera physalus*; Notarbartolo di Sciara *et al*., 2003) and short-beaked common dolphins (Bearzi *et al*., 2003) should be stimulated. Relevant information may result in part from the bottlenose dolphin workshop described above (see Action 4.9.) and, indirectly, from Action 4.8.

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ANNEX 1 - RELATED ACCOBAMS IMPLEMENTATION PRIORITIES

Action # 2
Investigation of competitive interactions between coastal dolphins and artisanal fisheries

A workshop sponsored by Italy in Rome in May 2001 investigated and evaluated efforts by fishermen and others to deter dolphins from nets. It was concluded that although the problem of dolphin depredation has become a major issue in the eyes of Mediterranean fishermen, and therefore deserves to be addressed in a responsible manner by government agencies and conservation groups, there is a danger that the *ad hoc* and even experimental use of noise-making deterrence devices could have unintended adverse effects on other species, as well as prove ineffective for reducing fishery-dolphin conflicts. The workshop produced a series of recommendations for research and development, and concluded that high-intensity acoustic devices that are typically used to keep pinnipeds away from aquaculture facilities are inappropriate for use in alleviating
conflicts between dolphins and fisheries in the Mediterranean. This project would consist in the implementation of the recommendations made by the Rome workshop. In particular, in addition to obtaining detailed quantitative information on the characteristics of common bottlenose and short-beaked common dolphin populations in the Mediterranean (see Actions 7 and 8), data should be collected on the spatial, seasonal, and operational features of small-scale coastal trammel and gillnet fisheries in the region.
Identification of a small number of exemplary «problem areas» where overlap occurs (i.e., high dolphin densities matched with high levels of fishing activity) should be followed by rigorous site-specific pilot studies to characterise and quantify the costs of dolphin depredation. Where serious problems are found to exist, rigorous tests of potential solutions should be conducted after extensive consultations with fishermen as well as technical experts. It is important that due consideration be given to the real or potential adverse side effects of any mitigation approach. Non-acoustic means of reducing conflicts, such as changes in methods of gear deployment, the use of quieter engines, the introduction of compensation or insurance mechanisms and the development of parallel dolphin watching activities, all hold promise and deserve to be evaluated.

Action # 4
Development and implementation of pilot conservation and management actions in welldefined key areas containing critical habitat for populations belonging to priority species
***(Delphinus delphis, Phocoena phocoena, Physeter macrocephalus, Tursiops truncatus*)**

In spite of the recent growth of scientific knowledge and attention on cetacean ecology in the Agreement area, and of the awareness of the survival threats these mammals are subject to, evidence is accumulating that some populations are declining in numbers and becoming increasingly fragmented within their shrinking range. Particular concern exists for short-beaked common dolphins in the Mediterranean, as well as for harbour porpoises, common bottlenose dolphins, and sperm whales. In some well-known instances, relic population units of these species are presently seen to be undergoing dramatic reductions in their numbers, and are thought likely to disappear soon if prompt measures are not taken. This action proposes to select four areas, each of them containing critical habitat for one of the four priority species, in which pilot conservation and management projects be developed and implemented immediately. Areas should be selected on the basis of sufficient available knowledge and characteristics of the area allowing the creation of a model, which can then be applied to other similar situations in the Agreement area. The following areas show particular promise as possible candidates: (a) the coastal waters surrounding the island of Kalamos, western Greece (short-beaked common dolphins); (b) the coastal area of southern Crimea, Ukraine, comprised between Cape Sarych and Cape Khersones (harbour porpoises and Black Sea common bottlenose dolphins); (c) the offshore waters of southern Crete, Greece (sperm whales); and (d) the waters of the Losinj-Cres Archipelago, Croatia (Mediterranean common bottlenose dolphins). Conservation measures should involve the establishment of *ad hoc* protected areas encompassing critical habitat for the target species and the adoption of experimental management plans with the involvement of local people and user groups;

measures should include intensive monitoring of the cetacean population, targeted research, regulation of impacting human activities, education efforts directed at the local fishing communities and recreational users, and promotion of more compatible, alternative activities (e.g., whale watching) and resource uses.

Action # 8

Conservation plan for common bottlenose dolphins (*Tursiops truncatus*) in the Mediterranean Sea

In the Mediterranean Sea, common bottlenose dolphins occur in scattered inshore communities of perhaps 50-150 individuals, and the gaps between them appear to be constantly increasing. Conservation threats are roughly similar to those facing short-beaked common dolphins and other small cetaceans of the region, except that common bottlenose dolphins in the Mediterranean Sea may be particularly vulnerable to human activities due to their near-shore occurrence and the fragmented character of their population structure. Incidental kills in trammel and gillnets occur frequently in some areas, probably at unsustainable rates. Overfishing of demersal fish may have affected the prey base for common bottlenose dolphins in some areas. Direct kills resulting from competitive interactions between common bottlenose dolphins and artisanal coastal fisheries are also a source of increasing concern. A series of population assessments across the Mediterranean subregion should be organised, where common bottlenose dolphins are known to occur, combined with larger-scale but less intensive surveys to identify previously unknown «hotspots» of occurrence. A comprehensive map of common bottlenose dolphin presence along the Mediterranean continental shelf should be created, with the identification of concentration zones (where critical habitat is likely to occur) and gaps. Photo-identification data should also be collected during the surveys, to help the creation of a pan-Mediterranean catalogue. Surveys should be designed to obtain data suitable for subsequent assessment of the species distribution and relative sighting frequency over time (e.g., consistent surveys conducted at 3-year intervals). Existing information and data recorded by research groups (either published or unpublished) should be inventoried in a comprehensive database, and made available to the wider community. Collection and analysis of time series data indicative of population trends should be favoured. Finally, efforts should be directed to monitor incidental catches and direct kills, and to investigate the possible role of contaminants and of nutritional stress from reduced availability of suitable prey. For the first phase of the project it is proposed that a steering committee be established with the task of completing the preparation of the plan, including the elaboration of the organisation, logistic, scientific, technical and financial aspects. It is envisaged that the complete proposal will be presented for approval to MOP2.

Action # 11

Development of photo-identification databases and programmes encompassing the entire ACCOBAMS Area

Studying free-ranging cetacean populations using photo-identification techniques has become a common, powerful research practice during the past decade in many areas of the world, including portions of the Agreement area. Such studies have proven, among other things, to hold considerable conservation value. Recently, a three-year programme, «Europhlukes», was funded by the European Commission with the goals of developing an European cetacean photo-id system as a support tool for marine research and conservation, to initiate a European network which will link providers with end-users of the European cetacean photo-id system, and to ensure future growth and maintenance of the system and its databases. Although a budget for this action could not be secured for the 2002-2004 period, it is highly recommended that an operational link be established between ACCOBAMS and the «Europhlukes» project management, to explore possibilities for future co-operative effort, for the extension of the programme to non-European partners within the Agreement Range States, and to help ensuring the indefinite continuation of this worthy initiative after the European project is terminated.

Action # 12

Establishment and implementation of a long-term training programme on cetacean research, monitoring and conservation/management techniques and procedures

Cetacean research and monitoring techniques have made considerable progress in recent decades, and provide significant support to the conservation and management effort. While such techniques are currently consistently applied, and even developed, in portions of the Agreement area, they are largely ignored elsewhere. Diffusing research and monitoring abilities throughout the region thus seems like a timely challenge and one of the highest priorities as far as cetacean conservation is concerned. The problem to be addressed is twofold: (a) transmitting knowledge through appropriate, effective and longlasting training procedures, and (b) ensuring that such hard-gained knowledge is put to good, long-term use once the trainees endeavour to apply it at home. Accordingly, this activity will firstly consist in the organisation of field-based training courses in areas providing ideal research facilities and opportunities, to teach standard research techniques and provide selected participants with a hands-on experience.

Secondly, follow-up support to the selected trainees in their countries, to assist with the development and implementation of research and conservation projects, will have to be provided through a cooperative effort between the Agreement Secretariat, or the appropriate Co-ordinating Unit, and the concerned Contracting Party.

Action # 16

Development of a network of specialised bibliographic collections and databases

One of the greatest hindrances to the region-wide development of a cetacean science tradition – a fundamental prerequisite to conservation and, ultimately, to the fulfilment of the purposes of the Agreement - is the diffused current unavailability of up-to-date specialised literature in most Range States' scientific and academic environment. This action proposes the establishment of a working group, which should include specialised librarian expertise, to examine the current availability of pertinent bibliographic material across the Agreement area, to strengthen existing facilities, and to identify locations where additional specialised libraries should be established. Support should be provided to existing libraries containing significant cetological bibliographic collections, to ensure continued updating and expansion, to facilitate access to information to the local scientific community, and to provide a framework for capacity building that will encourage documented cetacean research in the Agreement area. Modern document transfer and exchange technology should be adopted and promoted, and library databases should be managed within the context of a network that facilitates cross-library research and exchange of materials.

ANNEX 2 - ICRAM WORKSHOP CONCLUSIONS AND RECOMMENDATIONS

Reeves R.R., Read A.J. & Notarbartolo di Sciara G. 2001. Report of the workshop on interactions between dolphins and fisheries in the Mediterranean: evaluation of mitigation alternatives. ICRAM, Rome. 44 pp.

In addition to the **conclusions** highlighted elsewhere in the report, the workshop **concluded** that:

- Acoustic devices have the potential to damage the hearing of dolphins and other animals and to cause other impacts, such as habitat exclusion. However, the effects of acoustic exposure are highly species-specific and depend on each species' frequency sensitivity, and on the received level of the sound. Available data suggest that ultrasonic, low- intensity devices are most likely to be effective for deterring odontocetes while having the least probability of causing harm to other species.
- To evaluate the effectiveness of any mitigation strategy, it is necessary to have clearly stated management goals. At present, these do not exist in relation to fishery-dolphin conflicts in the Mediterranean.
- Very little quantitative information exists on: the nature and extent of interactions between dolphins and small-scale commercial fisheries in the Mediterranean, the costs of such interactions to the fisheries, or the effects of such interactions on dolphin populations.
- Given (a) what is currently known about the physiology and behaviour of bottlenose dolphins, (b) the potential for excluding dolphins from habitat (and consequent implications for the health of local dolphin populations) and (c) the potential for negative effects on monk seals, high- intensity acoustic devices such as those currently marketed as AHDs and used to deter pinnipeds from aquaculture operations are *inappropriate* for use in alleviating conflict between dolphins and fisherie s (or aquaculture operations) in the Mediterranean. This conclusion applies irrespective of the potentially high, or even prohibitive, costs of deploying these devices in the Mediterranean context. The workshop **underlined** that the use of AHDs in the Mediterranean may contravene current national and international regulations.
- In the absence of conclusive evidence that low- intensity acoustic devices (pingers) can be effective in reducing the frequency of interactions between dolphins and fisheries, further research on this topic would be useful.
- Non-acoustic means of reducing conflicts between dolphins and fisheries hold considerable promise and deserve detailed evaluation.

In addition to the **recommendations** highlighted elsewhere in the report, the workshop **recommended** that:

- Government agencies and international bodies begin developing and articulating management goals for mitigation of fishery-dolphin conflicts so that it will be possible to make meaningful evaluations of effectiveness.
- Site-specific studies be carried out (simultaneously) focusing on the characteristics of particular fisheries and on the ecology and behaviour of 'local' dolphin population(s). More information is needed on which animals are engaged in depredation, e.g. individuals or entire groups; older or younger animals, or both; males or females, or both. Photo- identification studies are essential for obtaining this kind of information and for investigating site fidelity. Use of 'signature whistles' to identify individuals involved in fishery depredation in the Mediterranean is unlikely to be practical, at least in the short term.
- Any long-term monitoring program include efforts to investigate and document dolphin mortality, to determine whether fishermen are taking retaliatory measures against dolphins.

ANNEX 3 - PEW MARINE CONSERVATION FELLOWS' ACTION STATEMENT FOR FISHERIES CONSERVATION

The urgent need to restore depleted marine populations and maintain sustainable fisheries was endorsed
by the World Summit for Sustainable Development in August 2002. These renewed commitments complement numerous prior international agreements, including the FAO Code of Conduct for Responsible Fishing and the FAO statement on a precautionary approach to fisheries management. All of these accords provide the context for the actions we stress below.

Two core problems face fishery management around the world: (1) a wide array of institutions and policies that provide perverse incentives to overfish and (2) the lack of alternatives for people plagued by poverty. National governments will need to address these core problems, employing a precautionary approach and a fully participatory process while implementing the following seventeen priority actions.

Engaging institutions and stakeholders

1. Secure the participation in policy-making and management of all interested parties, including fishers, managers, traders, consumers, scientists, and public interest groups.
2. Establish institutions and forms of governance that provide effective incentives for fishery participants to conserve fishery resources.
3. Ensure that all fishing activities within national waters are conducted under an allocation system that provides tenure to identifiable groups of domestic fishers, in a fair manner.
4. Empower consumers to use marine resources sustainably by strengthening and implementing verifiable third-party certification systems for sustainably produced marine products.

Managing and evaluating fisheries

5. Eliminate subsidies that contribute to the expansion of fishing effort beyond sustainable levels.
6. Assist in the development of environmentally sustainable and socially acceptable alternative and supplementary income opportunities for fishers, such that fishing effort in unsustainable fisheries is reduced.
7. Maximize any fishery's economic and social benefits to society within limits of environmental sustainability.
8. Manage offshore fishing rights to provide equitable benefits within the country.
9. Set performance objectives and publish regular evaluations of progress towards achieving actions listed in this statement.

Conserving ecosystems

10. Ensure development and use of fishing gear and practices that prevent harm to habitats and nontarget species.
11. Develop and enforce laws banning fisheries practices and gears that are deleterious to habitats and non-target fauna and flora.
12. Establish national and regional networks of no-take marine protected areas (MPAs) to sustain and enhance fisheries and protect habitats, as a contribution towards global networks of MPAs.
13. Monitor for early detection of ecosystem degradation, then plan and implement responses to halt this degradation.

Addressing technological interventions

14. Design and enforce standards for sustainable aquaculture that ensure economic viability (independent of perverse incentives) and prevent ecological harm.
15. Establish and enforce standards to prevent the escape of genetically modified organisms (GMOs) from production operations and subsequent introduction to coastal and offshore environments.
16. Exercise the greatest caution and scientific judgement before contemplating any intentional production or release of GMOs in the marine environment. Almost all such practices will be counterproductive to broader conservation efforts.
17. Advance and expand our understanding of the state of the oceans and ocean resources, creating and employing new technologies where necessary and environmentally acceptable.

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ANNEX XVIII

BASIN-WIDE SPERM WHALE SURVEY

Report of the summer 2003 sperm whale survey by the International Fund for Animal Welfare; preliminary findings and some considerations for a Mediterranean-wide survey

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Summary

There are currently no reliable population estimates of sperm whales in the Mediterranean. A basin-wide survey of sperm whale numbers is considered a high priority due to the likely isolation and uncertain status of the Mediterranean sperm whale population. In addition, several localised studies of sperm whales have been ongoing in the Mediterranean in recent years. Integrating with these studies, which include genetic analysis and photo-identification, is an important consideration in the design of a research programme to meet ACCOBAMS objectives.

The long dive duration of sperm whales causes a number of problems for visual survey methods. Alternative methods that have been used to obtain abundance estimates include passive acoustic line-transect and mark-recapture techniques based on photo-identification. Mark-recapture relies on very different assumptions to line-transect and can provide an independent comparison of line transect estimates. In addition, longer-term photo-identification studies can provide important data on demographic parameters.

The aim of the pilot study described here was to develop and test an appropriate survey protocol that could subsequently be used for the proposed ACCOBAMS basin-wide survey of sperm whales. The objective was to use cost effective methods that could provide adequate 'snap shot' abundance estimates while at the same time allowing data to be collected that could contribute to longer-term studies. The selected protocol involved a passive acoustic line transect survey conducted in both 'passing' and 'closing' modes. The acoustic survey techniques were based on those used successfully elsewhere and involved automated detection and location of sperm whales using a two element towed hydrophone. In 'passing mode' the survey vessel continued on pre-determined track lines regardless of whether sperm whales were detected. In 'closing mode' the survey was suspended according to a strict protocol when whales were detected to allow close approaches for photo-identification, behavioural observations, collection of sloughed skin and better group size estimation.

The core study areas were chosen as the Ionian Sea and the area incorporating the Sicilian and Malta Channels but data were also collected on passage through the western Mediterranean. Survey transects were designed to give approximately even coverage probabilities over the survey region including a variety of bathymetry.

A total of 8967km of acoustic effort were conducted over a period of 814 hours between 10 August and 17 October 2003. Poor weather resulted in fewer approaches to groups in closing mode than had been anticipated, but nevertheless suitable images for photo-identification were obtained from 10 individuals. Analysis of data are still ongoing but initial inspection of the data suggests that sufficient detections were made to allow estimation of strip widths and abundance using standard analyses based on perpendicular distance. An initial concern had been whether the detection software would allow group size estimation and location of individuals for the typical spatial distributions of whales within groups in the Mediterranean. Initial results indicate adequate performance of the acoustic methods for the majority of groups encountered, even in passing mode.

In terms of future surveys, the preliminary results suggest that the acoustic methods used can provide reliable abundance estimates. The optimum combination of passing and closing mode would need to be determined for any future survey, but the pilot survey has provided data on which to base such decisions. Initial results also indicate a correlation between sperm whale distribution and bathymetry that may allow more optimal stratification of survey effort.

Introduction

At the first meeting of the scientific committee to ACCOBAMS, held in October 2002, a basin-wide Mediterranean survey of sperm whales was discussed as Action point 9. It was concluded that it would be very useful to find out more about the distribution and abundance of sperm whales in the Mediterranean in order to inform measures to conserve them.

A meeting of interested parties was held at the annual meeting of the European Cetacean Society in the Canaries in March 2003 to discuss the survey and a pilot study. Three basic methods for obtaining an abundance estimate were considered; visual line-transect, acoustic line transect and mark recapture. A potential survey protocol was presented (Gordon, 2003). This protocol essentially contained two possible survey components: a 'passing mode' component comprising a standard line-transect survey using passive acoustic detection to locate sperm whales and a 'closing mode' component to visually verify group sizes, to carry out photo-identification, and to obtain ancillary information (e.g. samples for DNA analysis, body-size data, composition of groups, behaviour, etc).

The aim of the pilot study described here was to develop and test an appropriate survey protocol that could be used in the proposed basin-wide survey of sperm whales within the Mediterranean Sea. It is envisaged that the basin wide survey may take place either in a single year or in two years, and may use several vessels with capabilities similar to those of IFAW's research vessel, *Song of the Whale* – a 14 m auxiliary powered sailing vessel.

For the pilot study, acoustic survey methods were chosen over visual line transect, as sperm whales dive for prolonged periods (up to 50 or so minutes) and make loud regular characteristic broadband clicks. Between dives they may spend only short periods (as little as 10 minutes) at the surface. These characteristics make sperm whales difficult to survey visually but make them ideally suited to being surveyed acoustically. In addition, mark-recapture also provides useful demographic data and so a combined approach was considered.

The objectives of pilot study were to gain enough data on sperm whale encounter rates and group size in the Mediterranean to test whether the acoustic approaches used elsewhere would work there and to optimise a combination of line transect and photo-id survey methodologies. It was decided that an actual survey would be conducted in the Ionian Sea, an area where there had been little previous survey effort, and which was an appropriate size to conduct a survey in the time available for the study.

The pilot survey took place between August and October 2003 and analysis of the data is ongoing. The aim of this report is therefore to present a discussion on the methodology used, preliminary results and some preliminary recommendations following the survey. A final report will be available next year and it is hoped that this pilot study will be useful in the planning of the full survey.

A further important aim of the pilot study was to provide an opportunity for guest researchers and scientists from both Mediterranean marine research organisations and representatives of ACCOBAMS member countries to work alongside the team on board *Song of the Whale*, thereby contributing to research, exchanging ideas and learning new research techniques. Researchers included representatives from the following organisations: Pelagos Cetacean Research Institute, Tethys Research Institute, ICRAM and the Swiss Cetacean Society, and from the following ACCOBAMS countries: Albania, Egypt, Malta, Morocco, Tunisia and Turkey.

Consideration of possible survey methodologies

Following the meeting in the Canaries in 2003, the design of a pilot study using 'passing' and 'closing' mode survey methodologies and the merits of combining the two was considered.

Appendix 2 is a brief discussion of these methodologies. In summary, 'passing mode' is a line transect survey in this case making use of the fact that sperm whales are detected acoustically from the loud characteristic clicks they make when diving. Bearings to the clicks are obtained using a stereo hydrophone and specialist software, thereby providing an approximate location, allowing a 'Distance' type analysis to determine abundance (Leaper *et al* 2000).

In closing mode, once an individual or group of sperm whales has been sighted or detected acoustically, the line transect survey could be suspended and the animals could be 'closed' on using

acoustics to determine their location. This is an approach used by Barlow and Taylor (1998). The animals could then be counted visually and photo-identified.
One problem with combining both ‘passing’ and ‘closing’ modes is the potential for ‘closing mode’ to compromise the results of ‘passing mode’.

Methods

Acoustic survey

The acoustic system comprised of a two-element hydrophone towed 200 m behind the vessel. The hydrophone elements were Benthos AQ-4s spaced 3 m apart. The pre-amplifier frequency range was from 100 Hz to 40 kHz and with a gain of 30 dB. Signals were passed via a Sound Blaster Extigy external sound card sampling at 48 kHz (giving a bandwidth of 24 kHz) to ‘Rainbow Click’ (v3.00.0004 – see, www.ifaw.org/sotw) click detection and tracking software. Signals were filtered using a 2kHz high pass filter to reduce background noise.
The filter and click detection parameters within Rainbow Click and settings within the hardware were optimised and set during sperm whale encounters on the passage from the UK to Gibraltar. These settings were maintained throughout the rest of the survey in order not to complicate the determination of a detection function for the system. Rainbow Click continuously recorded data for all detected clicks (waveforms for clicks on both channels) to allow post survey analysis of the data.
A whistle detection program (‘Whistle’, see www.ifaw.org/sotw) also ran on the system. This programme detects and determines the relative bearing and approximate range to tonal sounds such as dolphin whistles and sonar.
A third programme, ‘Logger’ (see www.ifaw.org/sotw) automatically recorded the vessel’s position and a number of survey and environmental parameters such as wind speed, wind direction and sea surface temperature. Other environmental parameters were recorded at half hourly intervals by the researchers.
The optimal survey speed for *Song of the Whale* is 6 knots. This is a speed that can usually be motored without generating significant engine/propeller noise. In favourable conditions the vessel was sailed or motor-sailed. The propulsion method was recorded in Logger for use in analysis.
The system ran for 24 hours a day, a monitor was responsible for checking that the system was running correctly and for listening to the hydrophone at least every fifteen minutes.
If sperm whales were detected then the monitor would track their positions, determine the time that the last whale passed abeam and monitor for any new whales. Once all animals had passed the beam and the vessel had travelled for a further 30 minutes, if sea and daylight conditions were favourable the survey would be suspended and changed to ‘closing’ mode.

Visual Survey

Visual surveys were carried out between 7:00-12:00 and 14:00-19:00 in Beaufort sea states ≤ 3. Two observers were positioned on the port and starboard wings of the A-frame. The A-frame deck is 3.6 m above sea level giving an approximate eye-height of 5.1 m. Observers used their naked eyes to search and binoculars to confirm sightings. Observers scanned from the line made by the mast to the beam on their respective sides. Bearings were measured using angle boards and distances using reticules within the binoculars. Obstructions caused by sails or glare to the normal scan angle and sea state were recorded. Sightings of all marine mammals, turtles and large fish were recorded.

Combining passing and closing mode methodologies

In order to maximise the types of data collected, and because concerns had been expressed that it may not be possible to count all individuals passed within aggregations acoustically (and therefore such animals would need to be counted visually), it was decided to combine elements of both ‘passing’ and ‘closing’ mode methodologies.
The crux of combining these two methodologies is choosing when to suspend ‘passing’ mode and adopt ‘closing’ mode – too early and both the triangulation of the bearings may be unreliable and animals ahead, that have not yet been surveyed, may be disturbed. Too late and it may prove difficult to re-find the animals and time will be wasted both travelling back to the animals and then returning to

the break point to resume the survey. Furthermore the choice of the point at which the line transect survey is suspended may also bias the abundance estimate.

In order to triangulate bearings reasonably reliably it was decided that the bearing relative to the survey line should ideally reach about ±120° i.e. a back bearing of ±60° (triangulation with 45° will give the smallest positional errors). The distance d along the track line that the vessel would have to travel passed a whale at close to the acoustic range would then be given by: d = R.cos(60°) (where R is the acoustic range) i.e. d = R/2. An estimation of the system's detection range as 6 nautical miles would give d as 3 nautical miles (1/2 hour at a survey speed of 6 knots).

Simulations were carried out to examine the effect of the choice of break point on abundance estimates. Stopping at a point when there is a higher than average probability of encountering an animal in the next few minutes will negatively bias the abundance estimate. Whereas, if the survey track is broken at a point when it is known to be less likely that an animal is about to be encountered, there will be a positive bias in the abundance estimate. When animals are clustered, the former is a worse problem than the latter, so the strategy of continuing for some time passed the last detected animal was adopted. As would be expected, simulations showed that the best abundance estimates would be obtained by not stopping at all, i.e. no 'closing mode'.

By choosing to pass the last animal detected by 3 nautical miles would allow detection of animals at up to 9 nautical miles ahead of the point when the last animal went abeam assuming a detection range of 6 nautical miles. The appropriateness of this distance in order not to prematurely break from passing mode in the Mediterranean will depend on the overall distribution of animals (for aggregations of animals the distance between animals within aggregations compared to the distance between aggregations will be pertinent). In order to gain more information on such distributions it was decided that in the pilot study only side-to-side positional ambiguities would be eliminated, when possible, by incorporating a 5° zig-zag from the transect line when passing sperm whales so allowing us to map approximate whale locations and therefore group distributions.

As daylight and reasonable sea conditions are required for 'closing mode' the survey would only be broken if these conditions were favourable.

Closing Mode

Once broken from the survey the visual observers would carry out 360° scans for flukes in order to assess numbers. The vessel would be directed to sperm whales using acoustics and surfaced animals followed. Where possible observations of the presence or absence of calluses would be made. Photo-identification of the flukes would be carried out from the deck when animals dived using up to three photo-ID cameras – a digital camera: Cannon EOS D10 and two film cameras: Cannon EOS Elan IIe and Cannon T90 (see appendix for full details). The vessel would move into the footprint of dived animals and any sloughed skin recovered for storage and DNA analysis. The footprints of any animals that had breached would also be investigated.

Study area and track design

The core study areas were chosen as the Ionian Sea and the area incorporating the Sicilian and Malta Channels. These areas provided a variety of bathymetry (continental shelf, shelf slope, ocean trench and abyssal plain), they have had limited research carried out within them (in particular there is a paucity of photo-ID data in the area – there are many images from areas both to the east and west but no matches between them), provided a number of useful ports and were central to the Mediterranean. From the limited research carried out in these areas, it was known that at least some sperm whales were present (Gannier *et al*, 2002). In order for *Song of the Whale* to get to the core study areas it was necessary for it to pass through the western Mediterranean. It was decided to also treat this as a study area.

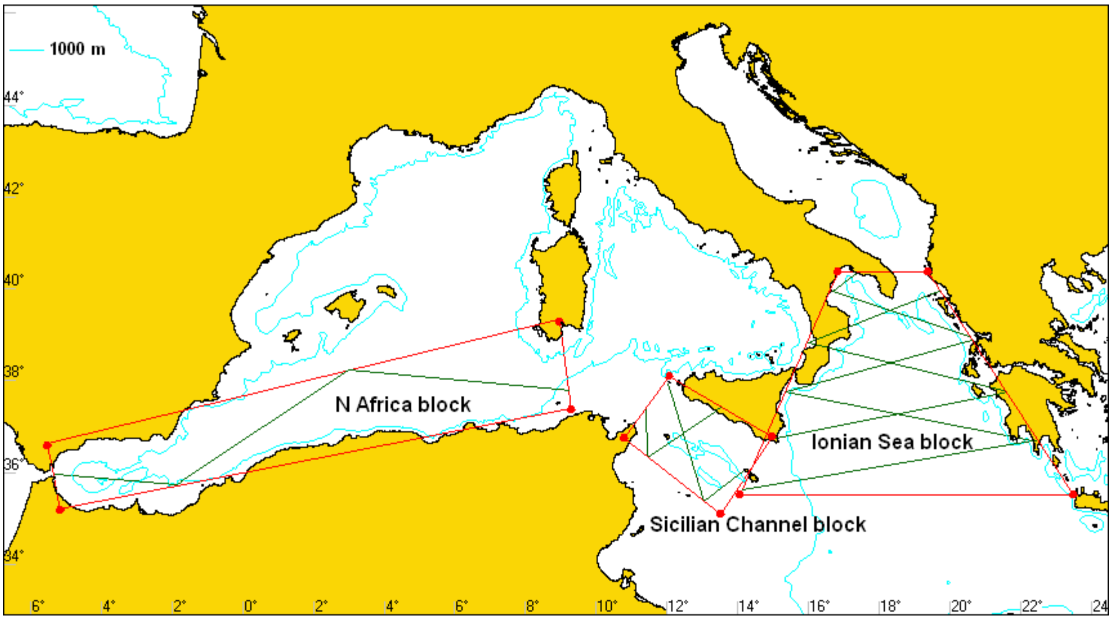

Figure 1. Survey blocks and layout of survey tracks.

The three study areas were enclosed by polygons. Zig-zag transects were placed by defining a principal axis and using evenly-spaced waypoints as described by Buckland *et al*. (2001).
In each polygon, coverage probabilities can be estimated by simulation assuming a random start. The North Africa and Sicilian / Malta Straits survey polygons were more-or-less rectangular, so that coverage probabilities are approximately even over the survey region. The Ionian Sea polygon was trapezium-shaped to give more efficient routes (less overland coverage). This resulted in greater coverage probabilities further north.
Passages between the ends of the survey transects were designed so that the vessel could navigate quickly and safely between the two. The survey areas, enclosing blocks and transects are shown in figures 1.

Modifications to the survey methodology for others species
Photo-identification of bow-riding bottlenose, common and Risso's dolphins would be carried out if it could be done without breaking from the survey.
If beaked whales or any other unusual species (including false or pygmy killer whales, dwarf sperm whales, rough-toothed dolphins, basking or white sharks) were found then the survey would be suspended and, where appropriate, high frequency recordings made and photographs and video taken.

Results
The survey in the Mediterranean started on 10 August 2003 when *Song of the Whale* left Gibraltar and ended on 17 October in Monaco. Analysis of the data is ongoing. Preliminary results are provided here.
Figures 2 - 4 show the track of the vessel and acoustic (figure 2) and visual (figures 3 - 4) effort. Table 1 gives a breakdown of the survey track length and duration by effort type. All planned transects were completed.

Track type	nautical miles	km	hours
Total track	5098	9441	863
Visually surveyed	917	1699	147
Acoustically surveyed	4842	8967	814

Table 1. Survey track length and duration by effort type.

Sperm whales

4842 nautical miles of track were surveyed acoustically within the Mediterranean, see figure 2. There was a minimum of 20 detections of sperms whales identified in the field, of these 8 were of single animals while the remainder were of groups. A more thorough programme of offline analysis is currently being undertaken. 917 nautical miles of visual survey were conducted but no sperm whales were sighted during the visual survey. Sperm whales were seen on 7 occasions (7 encounters - singles or groups) following acoustic tracking.

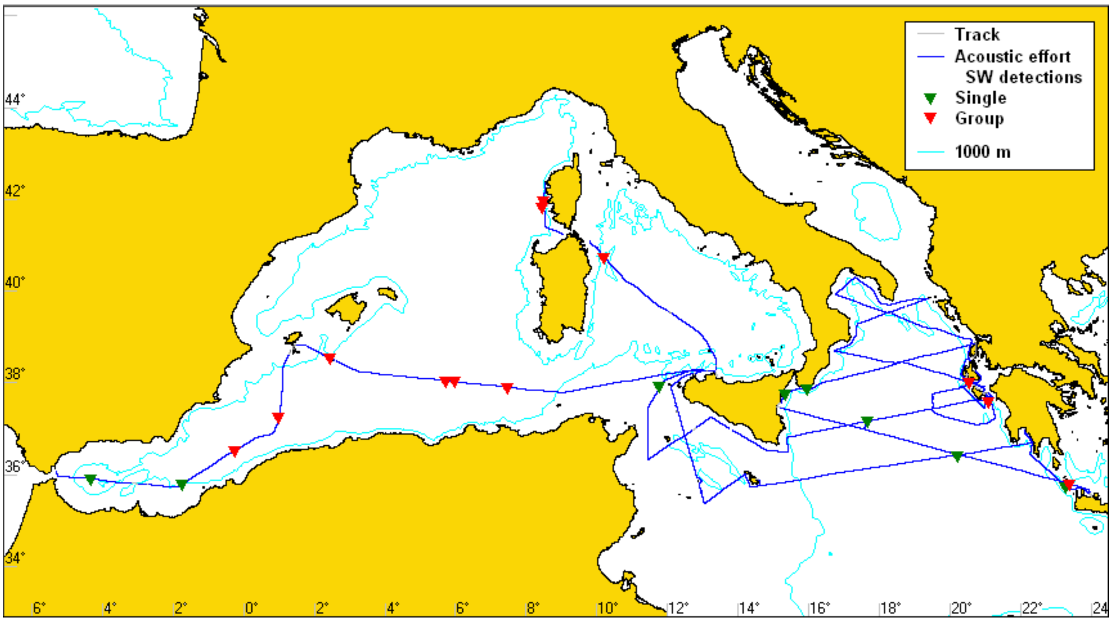

Figure 2. Acoustic survey tracks and sperm whale detections.

Using the tools within Rainbow Click to carry out offline data analysis it has been possible to distinguish between the individual whales within the groups of sperm whales so far analysed and so count the numbers of animals present. The characteristics used include the click bearing and its variation with time, the acoustic properties of the clicks (waveform, power spectrum, and the sound to the ear) and the inter-click interval. As not all detections have been so analysed no results of group size are presented here.

No sperm whales were detected immediately ahead of the vessel following the resumption of the line transect survey from the point where the survey had been suspended in order to close on animals. Analysis of the distribution of animals within groups has not yet been undertaken.

A number of distinctive patterns of vocalisations, known as codas, were detected; so far this has included 3+1, 3+2 and 8 click codas. Clicks were often of high enough quality to allow analysis of the .CLK files to determine the inter-pulse intervals and so estimate body size (Gordon, 1991).

Unfortunately many of the encounters with sperm whales were at night, in poor weather conditions or when the vessel had been delayed by weather and was on a tight schedule. Consequently it was only possible to 'close' on sperm whales on 5 occasions - 2 single animals and 3 groups.

14 whales were photographed. These images were compared with images held for the Mediterranean in NAMSC (287 images) and with images in the Pelagos collection (408 - awaiting submission to the catalogue), but no matches were found.

The Canon 10D digital camera, being used for the first time, worked extremely well taking sharp, high-resolution images. It was able to take sequences of images, store large numbers of images and record useful metadata.

Only on one occasion was sloughed skin observed following a whale's dive, however this sunk before it could be recovered.

Only on one occasion, when there was more than one whale present, was a visual fluke scan and count conducted, however the sea state reached Beaufort 4 and only 3 flukes were counted during the encounter despite the fact that at least 9 whales were detected acoustically in the field.

The distribution of sperm whales in relation to bathymetry awaits detailed analysis, however preliminary indications suggest three components to this distribution:

1. no animals were found in shallow continental shelf waters.
2. some animals, were found in abyssal plain waters, in the Ionian Sea these were mostly lone animals.
3. more animals, particularly those in groups, were found along the continental shelf slopes, in the Ionian Sea there were three groups associated with the Hellenic trench.

As not all detections have yet been analysed no acoustic detection function and consequently no acoustic survey strip-width have yet been determined. A minimum of 30 detections is normally regarded as necessary to determine a reasonable detection function. This number of detections was exceeded during the survey.

Following this year's survey there will not have been enough coverage within the north African and Sicilian Channel blocks to determine abundance estimates for these areas, although data are useful to provide an approximate encounter rate for subsequent survey planning. Data obtained in the future could be used to supplement this so that abundance estimates may be determined. However the detections made in these blocks can still be used in the determination of a detection function for the system.

Results for other species

The number of sightings of species is summarised in table 2 and the distribution of cetacean sightings is shown in figures 3 and 4.

	Incidental sightings	Visual survey sightings	Total sightings
Bottlenose dolphin	2	2	4
Common dolphin	2	2	4
Risso's dolphin	2	1	3
Rough-toothed dolphin	1		1
Striped dolphin	17	19	36
Unidentified dolphin	11	12	23
Cuvier's beaked whale	1		1
Sperm whale	*7		*7
Sunfish (Mola mola)	1	2	3
Turtle (hardbacks)	11	10	21

Table 1. Summary of sightings by visual effort
(number of encounters – not animals).
* all sperm whales were sighted following acoustic tracking.

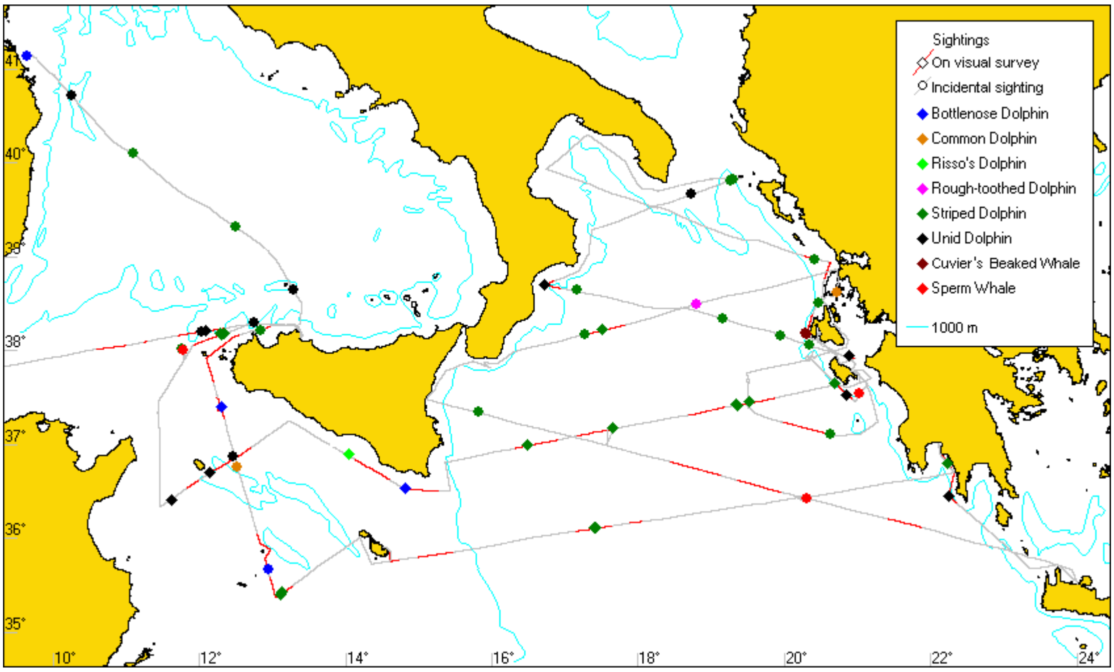

Figure 3. Visual survey tracks with cetacean sightings for the Tyrrhenian Sea, Sicilian Channel and Ionian Sea.

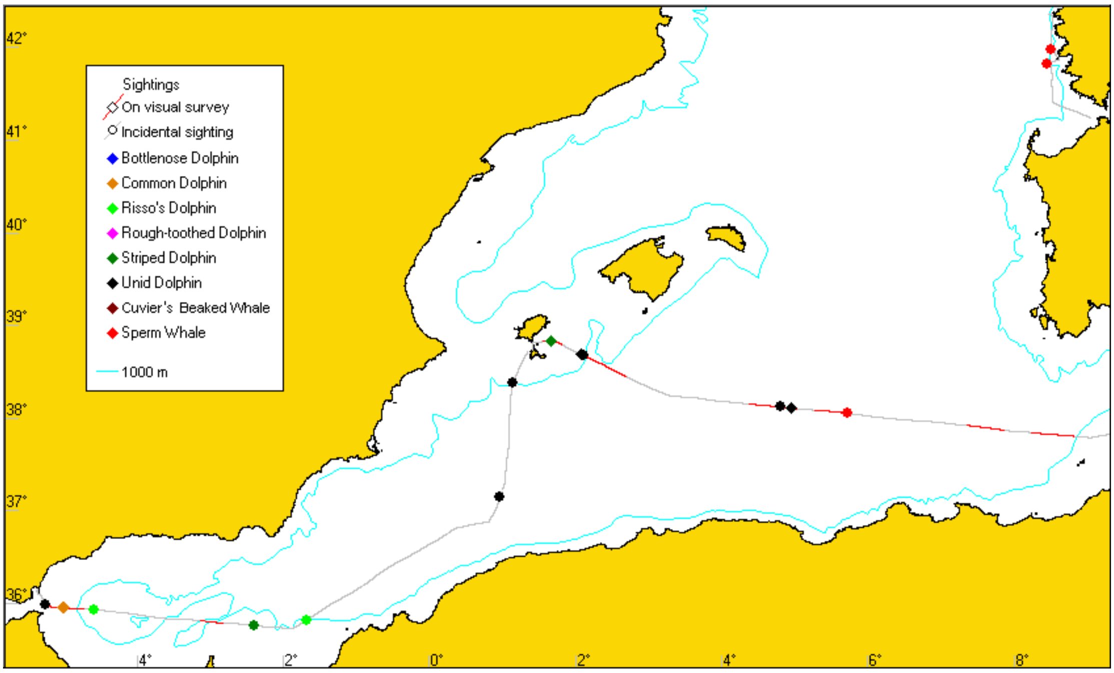

Figure 4. Visual survey tracks with cetacean sightings for the western Mediterranean.

There were two encounters with species less common in the Mediterranean: a group of 3 Cuvier's beaked whales west of the island of Kefallinia, Greece and a group of 6 rough-toothed dolphins offshore in the northern Ionian. Acoustic recordings and photographs were taken of these animals.
Photo-identification photographs were taken of bottlenose, common, Risso's and rough-toothed dolphins. Photographs and associated data will be distributed to interested parties and submitted to Europhlukes.
High-frequency recordings of the vocalisations of bottlenose, striped and rough-toothed dolphins were made. High-frequency recordings were also made when in the vicinity of Cuvier's beaked whales; preliminary analysis suggests no vocalisations were recorded.

A considerable number of dolphin whistles were detected and stored in .WSL files, all detections of groups of dolphins were also automatically recorded and saved in .WAV files. This data / recordings await analysis.

Preliminary conclusions and recommendations for the design of the basin-wide survey

The acoustic line transect surveys, using a two-element towed hydrophones, worked well and this study demonstrates that they are an effective way to gather data for analysis by 'Distance' methods in order to determine abundance estimates for sperm whales in the Mediterranean.
Anticipated problems with group sizes were generally effectively resolved using acoustic methods. Individual animals within groups of whales can be tracked and distinguished from each other acoustically within encounters, and therefore counted, as required for Distance analysis, using acoustics and appropriate software tools. It is therefore not necessary to 'close' on animals to make a visual count, indeed visual counts maybe less accurate than acoustic counts and can only be carried out in daylight and in good weather.
The closer animals are physically together when they are dived and the longer such proximity is maintained, the more difficult it becomes to separate animals acoustically. Unpublished data presented by Nowacek *et al* (2003) from research using 'D-Tags' attached to sperm whales in the Gulf of Mexico shows that even when whales are closely associating at the surface, they spread out over quite a wide distance under the water while feeding and then come back together just as they return to the surface – this makes the problem of acoustically separating individuals much easier.
Photo-identification (although unfortunately rather more limited than planned) was achieved as part of the 'closing mode' methodology without significantly compromising the acoustic data collection efforts. If photo-id is carried out over at least two periods of time, an abundance estimate can also be determined using capture-recapture analysis. Closing mode allows the collection of other data such as samples for DNA analysis, photo-grammetry, composition of groups, and behavioural data.
Dolphins were detected many more times than they were sighted. Summary data for each whistle detected was stored with recordings of multiple whistles some of which could be matched to visual sightings. If there were a means of reliably determining, preferably automatically, the species of each set of whistles this would enhance the usefulness of this data and of data collected in future surveys.

Considerations for the basin-wide survey
On several occasions, conducting photo-identification was prevented due to certain circumstances, including poor weather, the tight field work schedule etc., compromising the flexibility needed to stay with detected whales overnight or through bad weather. The more flexible the survey can be in terms of schedule/timetable etc the greater will be the opportunities to close on animals.
One possibility for a basin-wide survey would be to concentrate on acoustic line-transect surveys with a limited amount of photo-identification in the first year, followed by a second year dedicated to photo-identification.
If it were not possible to carry photo-identification over two periods, and therefore not possible to carry out capture-recapture analysis, photo-identification could still be used to study movements, life history, group relationships and reproductive success.
A combination of 'passing' and 'closing' modes was used throughout this pilot study. It was found that breaking from the line transect survey only after the vessel had progressed a distance equivalent to about ½ its acoustic range passed the point at which the last whale had passed the beam allowed accurate perpendicular distances to the whales to be obtained, avoided suspending the survey in mid-group and allowed the vessel to close on the animals in a reasonable time without problems of losing animals.
Early results from the survey indicate that there may be a correlation between sperm whale distribution and bathymetry, in which case it may be more efficient to use a stratified design for transects within the survey i.e. concentration of survey effort on the shelf edges and trenches with less effort over the abyssal plain and with even less effort (but still some) over the continental shelf.
Continuing, long term, regional photo-identification effort by local research groups is very important in elucidating broad questions about the population dynamics of sperm whales in the Mediterranean. A basin-wide, one or two year survey will potentially provide a most valuable 'snap shot' of sperm

whale abundance, but complementary, on-going long-term studies, conducted over many years are also required if a comprehensive picture of the ecology, abundance and status of Mediterranean sperm whales is to be built up.
Planning for the basin wide survey will depend largely on whether the planned survey will take place over a single year or two subsequent years.
The kind of boats that will be used for the basin-wide survey will have a significant impact on planning. If an acoustic survey is to be conducted there needs to be careful consideration about the noise levels of the vessels. However, vessels as large as 100m in length have been used successfully for acoustic surveys of sperm whales (e.g. Leaper *et al.,* 2000).

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Appendix 1

Details of cameras

1. Cannon EOS D10 with 80-200 mm auto-focus zoom lens. The lens is designed for a standard 35 mm film camera, when used on a digital body it's magnification is increased by 1.6 therefore it is effectively 128-320mm. Set to shoot as if using ASA 100 film.
2. Cannon T90 with Cannon 300 mm manual focus lens shooting with Fuji Provia 400 or 200.
3. Cannon EOS Elan IIe 300 mm auto-focus lens shooting with Fuji Provia 100 or 200.

Cameras all used in shutter priority mode set to 1/1000 s unless low light conditions dictated otherwise.

Appendix 2

Survey methodology

Passing Mode - Line transect

Sperm whales dive for prolonged periods when they make loud regular characteristic broadband clicks. Between dives they may spend only short periods (as little as 10 minutes) at the surface. These characteristics make sperm whales difficult to survey visually but make them ideally suited to being surveyed acoustically.

Acoustic surveying for sperm whales can take place when visual surveying is not possible – during the night, during mist or fog and during elevated sea-states. Furthermore acoustic surveys can be conducted automatically requiring little operator intervention, consequently fewer people are required and so smaller vessels can be utilised, both reducing survey logistics and costs. Ancillary data such as coda usage, body length (using analysis of inter-pulse interval), and behavioural information provided by creaks and clangs can also be acquired.

The use of a simple two-element hydrophone combined with appropriate processing and analysis software, allow the angles to whale clicks, relative to the hydrophone's axis, to be determined. After movement of the survey platform these angles can be triangulated to give the approximate location of the whale (with a side-to-side ambiguity). From this the whales' range and relative bearing at the surface can be estimated so allowing 'Distance' type analysis of the line-transect survey data to determine abundance (Leaper *et al*, 2000). This method requires that the sounds of individual whales can be tracked over periods of time, and not confused with those of other animals, such tracking can be carried out after the survey provided the necessary data has been collected. Confusion between animals would result in bearings to different animals becoming mixed, which in turn would lead to the determination of erroneous positions. The collection of continuous sound data has the added advantage that animals that are only clicking intermittently are not overlooked, and that the survey strip-width is maintained at its maximum.

It is also possible to estimate abundance using point samples, i.e. by listening at discreet stations. Cartwheels analysis can be used to derive abundance estimates from this type of data (Gillespie 1997; Hiby and Lovell 1989). However Cartwheels analysis does not make optimum use of the bearing data (bearings are binned into 45° sectors) obtained when using two-element hydrophones so diminishing the merit of the estimate.

Sources of errors

Downward errors in the abundance estimate due to not taking account of a failure to detect all the animals on or below the survey line will be dependent upon the relationship between the acoustic detection range, the speed of the platform and the duration and frequency of the whale's quiet periods i.e. will the whale remain silent while within the acoustic range of the platform? As the acoustic range is usually large compared to the duration of the whale's quiet periods this error will be minimal. Behavioural data can be used to correct such errors and errors can be minimised by appropriate selection of survey parameters.

If the whales' swim speed and direction are not considered during the triangulation of the whales' position there will be an associated error. This error will be smaller if the speed of the platform is relatively large compared to that of the whale.

If the positions of whales are simply calculated by taking the angles of clicks relative to the hydrophone's axis and transposing these to bearings from the survey line at the sea surface and then using these to triangulate whale positions, then there will be an error which will tend to exaggerate the distance of the whale from the survey line. E.g. if the platform passes directly over a whale then using this simple transposition the distance of the whale perpendicular to the survey line would be equal to the depth of the animal below the surface and not zero as it should be. A theoretical correction can be applied.

The ambiguity as to which side of the survey line the whale's position lies, is not a source of error when using 'Distance' analysis as all positions (giving the distance from the track line) can be pooled to determine the strip ½ width.

Closing Mode

Once an individual or group of sperm whales has been sighted or detected acoustically the line transect survey could be suspended and the animals could be 'closed' on using acoustics to determine their location. This is an approach used by Barlow and Taylor (1998). The animals could then be counted visually and photo-identified. Ancillary data could also be collected at this point including taking samples for DNA analysis (e.g. from sloughed skin or faeces), size measurements, group composition, behavioural data, etc.

It had been suggested that one reason for using 'closing mode' was so that an accurate count of animals found during 'passing mode' could be made visually as there was some concern that individual animals could not be resolved using Rainbow Click. 'Closing mode' would allow images to be taken for photo-identification studies which could use capture-recapture analysis as an alternative means of deriving abundance. Photo-identification data could also provide important information for life history studies, movement patterns, group relationships, etc.

The use of photo-identification data in capture-recapture analysis depends upon there being, at least, two periods of photo-identification (the capture and recapture). However, if it is found that it is not feasible to have two surveys this data is important to obtain for other reasons, as listed above.

ANNEX XIX

BASIN-WIDE SPERM WHALE SURVEY

Preliminary Report on the Sperm Whale Data Collected During the *Voyage of the Odyssey*

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Abstract

Ocean Alliance (OA) launched the *Voyage of the Odyssey* (VOO) in response to growing concern about the impact of chemical pollution in the marine environment. The Voyage of the Odyssey is a five-year global effort designed to gather a baseline dataset on levels and potential effects of synthetic contaminants in all of the world's oceans. The sperm whale (*Physeter macrocephalus*) was chosen as a bio-indicator species for the program. Lipophilic contaminants are likely to accumulate and biomagnify in sperm whales due to their high body fat content, their relatively long life span and their high trophic position within marine food webs. Moreover, because sperm whales have a global geographical distribution, a worldwide dataset can be collected from this one species. In addition to our toxicological studies, we are also collecting material and data for sperm whale genetics and acoustic analyses. The specific aims of the VOO program and the relevance of these aims to the International Whaling Commission (IWC) Scientific Committee's efforts at making an in-depth assessment of sperm whales are summarized. OA methodologies for biopsy collection and sub-sampling and the current status of our data collection and analyses are presented.

Introduction

The oceans are considered the final sink for many toxicants and there is a growing concern about the impact of chemical pollution in the marine environment and its potential effects on the health of animals, plants and humans. Lipophilic contaminants, such as dichlorodiphenyltrichloroethanes (DDTs), polychlorinated biphenyls (PCBs) and other organochlorines (OCs), are known to accumulate in animal species including fish and marine mammals (Colborn and Smolen, 1996; Jorgenson, 2001). Many of these compounds have been shown to adversely effect laboratory animals and wildlife (Safe, 1984; Colborn *et al.*, 1993). Much research effort is dedicated to understanding the potential links between chemical exposure and altered immune and reproductive systems, impaired physiological and endocrine functions as well as neurobehavioural disorders in traditional animal models (rodents) and certain wildlife species (Fry and Toone, 1981; Beard and Rawlings, 1998; Hany *et al.*, 1999; Guillette *et al.*, 2000; Fox, 2001). However, scientific understanding of the effects of environmental pollution in marine mammals remains limited (Reijnders, 1986; Beland *et al.*, 1993; Ross *et al.*, 1996; Ross, 2000; Martineau *et al.*, 2002).

Ocean Alliance launched the *Voyage of the Odyssey* (VOO) to address the need for a globally integrated dataset allowing a consistent analysis of exposure to, and potential effects of, persistent organochlorines in marine life worldwide. Many marine mammals harbour large fatty reserves in their body where high levels of organochlorines and other lipophilic contaminants can accumulate (Aguilar and Borrell, 1994; Colborn and Smolen, 1996; Ross *et al.*, 2000). Marine mammals are also subject to bioaccumulation and biomagnification of these fat soluble contaminants due to their relatively long life span and their high trophic position within marine food chains (Boon *et al.*, 1992). Marine mammals therefore can be considered environmentally relevant candidates for use as sentinel species when assessing marine pollution (Ross, 2000). Sperm whales were selected as the study species for the VOO program due to their high trophic position and their widespread geographical distribution and because they can be acoustically tracked.

Over 700 sperm whale skin and blubber biopsies have already been collected during the Voyage of the Odyssey. Analyses of concentration burdens, exposure and the molecular effects of bio-persistent toxicants in these biopsies are presently underway. Induction of the cytochrome P4501A1 enzyme (CYP1A1), which plays a critical role in the metabolism of planar halogenated and polycyclic aromatic hydrocarbons, is widely used as a biomarker of exposure to contaminants in many animal species (Stegeman *et al.*, 1992). The toxicological component of the VOO program is designed to investigate CYP1A1 (and other CYP1) protein and gene expression in sperm whales using immunohistochemistry, enzyme, and gene expression assays. For each biopsy sample, additional analyses including genetic and stable isotopes studies will provide a comprehensive framework for the interpretation of the toxicology data.

Specific Aims of the VOO Program and Relevance to Sperm Whale Assessment:

1. Provide samples to current researchers and establish an archive of samples from whales, squid, and pelagic fish living in the major ocean basins of the world. As new techniques or scientific questions arise, material from this archive will be made available to outside researchers.
2. Establish a biopsy sub-sampling protocol providing concurrent collection and storage of sub-samples for each biopsy, thereby maximizing the magnitude of information and data collected and potentially reducing the need for future re-sampling.
3. Conduct contaminant burden analyses of sperm whale samples with an emphasis on persistent organohalogens that are implicated in immunosuppression, altered endocrine and reproductive systems, cancer, and various pathologies in laboratory animals.
4. Conduct contaminant burden analyses of other biological samples (squid, fish) to examine biomagnification processes of other species in the food pyramids in which sperm whales feed.
5. Conduct analyses of biopsy samples for levels of CYP1A1. CYP1A1 can be used as a biomarker of exposure to environmental contaminants, such as persistent planar halogenated aromatic hydrocarbons and non-persistent polycyclic aromatic hydrocarbons.
6. Adapt toxicological assays and biomarkers developed in laboratory animals to marine mammal species. Examples include specific gene cloning, quantitative RT-PCR of CYP1A1 gene expression and assessment of cytochrome P450 1B1 (CYP1B1).
7. Compare data obtained with contaminant and biomarker analyses in order to investigate and potentially characterize the direct links between the two approaches and to validate and refine such techniques.
8. Broaden the fundamental understanding of cetacean, and particularly sperm whale, toxicology by:
    a. Analyzing VOO toxicological data (both chemical and mechanistic data) in the context of the additional information collected for each biopsy (genetic analyses, stable isotopes analyses).
    b. Comparing VOO toxicological data with other available marine mammal toxicology data and with laboratory animal studies.
9. Study the identity of sperm whale prey by comparative analyses of prey samples regurgitated by whales, potential prey species collected at sites of sperm whale sightings, and squid beaks collected in whale feces.
10. Investigate trophic relationships between sperm whales and potential prey species using stable isotope analyses.
11. Collect and analyze sighting data from the Odyssey to broaden the knowledge of sperm whale zoogeography and habitat use in tropical waters.
12. Generate a global data set of sperm whale communication sounds, so-called codas, to test theories of dialects and acoustically mediated culture in sperm whales.
13. Quantify and map anthropogenic noise sources in the world's oceans to form the basis for mitigation of human activities in critical habitats for marine mammals.
14. Record samples of sound from different tropical sperm whale populations to assess the size compositions of different stocks from the interpulse intervals in the multipulse structure of sperm whale clicks.

15. Quantify source parameters of sperm whale sounds in order to assess the communicative space and echolocation potential of different click types and to study potential effects of man made noise on such sounds.
16. Study sperm whale sound production with ultrasound-time-depth recording tags.
17. Use genetics and photo-identification analyses to investigate population and stock structure, short-term and long range movements of sperm whales, and habitat use.
18. Design and validate of new methodologies for toxicological, genetic and acoustic studies of sperm whales.
19. Design a comprehensive and collaborative interpretation of all VOO data (toxicology, genetics, acoustics) to benefit management strategies

Existing Methodologies and Current Status of Analyses

Biopsy Collection

In order to minimize potential disturbance to the whales due to close approach of the vessel, the *Odyssey* has a platform near the bow that projects laterally for eight meters (to starboard). Biopsy arrows are deployed from this platform and the minimum distance required between vessel and animal for sample collection is therefore achieved. Effort is made to sample whales when they are arching their backs for deep dives—a time when a greater proportion of the animal's flank clears the water. The biopsy darts used are 40mm long, 8mm in diameter and fitted with three internal prongs to retain the tissue plug. The stainless steel cylindrical punch is washed in soapy water, sterilized in alcohol and rinsed in de-ionized water before use. Arrows fitted with a compressed foam stopper (designed by Ceta-Dart, Dr. F. Larsen, Copenhagen, Denmark) are fired at a range of 10 to 20 meters from a 68kg pull, compound crossbow (Barnett RC 150). Biopsy samples are usually collected from the flank of the animal below the dorsal fin, and the region of each dart strike is recorded. The floating dart is recovered with a dip net and the biopsy tissue obtained is processed immediately. Over 700 biopsy samples have now been collected from the gulf of California, the Galapagos Islands, several locations across the Pacific Ocean, Papua New Guinea, Australia, the Chagos Archipelago, the Seychelles, the Maldives, Sri Lanka and other locations from the Indian ocean.

Biopsy Tissue Sub-sampling

A detailed protocol for sub-sampling along with a review of the current data obtained for each type of sub-sample is in progress by the authors and will be the subject of a later communication.

Briefly, each biopsy sample is divided immediately after collection into the following sub-samples in order to maximize the data and information that can be gathered from each animal.

1. Biomarker analyses for cytochrome P4501A analyses: sub-samples of the epidermis/dermis interface layer are collected and stored in liquid nitrogen, RNAlater (Ambion) or in 10% neutral buffered formalin in accordance with the different storage requirements for future expression studies at the enzymatic, mRNA, or protein levels.
2. Contaminant burden analyses: blubber sub-samples are collected and stored at -20ºC in decontaminated glass vials for chemical analyses.
3. Genetics: subsamples of the epidermis are stored at room temperature in dimethyl sulphoxide saturated with sodium chloride as previously described (Amos and Hoelzel, 1991).
4. Stable isotope analyses: sub-samples of epidermis and/or dermis are allocated for stable isotope analyses and frozen at –20ºC.
5. Fatty acid analyses: whenever possible, sub-samples of dermis are also collected for fatty acid analyses and stored at -20ºC.

Biomarker Analyses

Sections of biopsy sub-samples stored in neutral buffered formalin are embedded in paraffin and prepared for immunohistochemical staining of cytochrome P4501A1 as previously described (Smolowitz *et al.*, 1991; Woodin *et al.*, 1997). Staining is achieved using the monoclonal antibody Mab 1-12-3 which is known to be highly specific to CYP1A1 in fish and mammals (Park *et al.*, 1986; Kloepper-Sams *et al.*, 1987; Drahushuk *et al.*, 1998). CYP1A1 protein expression was examined in

sperm whale biopsies that we collected in the Sea of Cortez (Mexico), the Galapagos Islands, several locations across the Pacific, Papua New Guinea, and Australia. In each of these regions we detected such expression. Quantitative analyses using a modification of the procedure of Woodin et al. (1997) is underway and will allow comparisons among these geographical areas.
Skin samples, of similar sizes than the biopsies collected by VOO, have been collected from stranded whales and have been prepared and analyzed for CYP1A1 enzymatic activity in order to refine protocols. Samples from both stranded and biopsied cetaceans have also been used for the partial cloning of CYP1A1 and CYP1B1 in preparation for the development of a quantitative RT-PCR protocol for these two genes in the sperm whale (Godard, 2000; Godard *et al.*, 2000).

Contaminant Burden Analyses
A subset of 30 biopsy samples representative of the Sea of Cortez, Galapagos and the first VOO Pacific crossing leg were analyzed in collaboration with Dr. Kannan and Dr. Giesy, National Food Safety and Toxicology Center, Michigan State University. Tissue samples were pooled due to their small sample size (<1g), according to region and day to help validate interpretation. The samples were fibrous and had a lower lipid content (mean: 6.2%) than expected. DDTs (338 to 7942 ng/g lipid weight) were the leading compounds in most pooled sperm whale samples, with p,p'-pDDE being the most predominant metabolite of DDT. Among organochlorine pesticides, Chlordane compounds were next in abundance to DDT. PCBs were found in all pooled samples with total concentrations between 166 and 3966 ng/g lipid weight. DDTs and PCBs levels do not appear to be correlated and vary significantly among pooled samples within a same region.

Genetics
Samples collected in the Sea of Cortez have been analyzed for gender in collaboration with Dr. S. Mesnick from the Southwest Fisheries Science Center (San Diego, CA), Dr. R. Vázquez-Juárez from the Centro de Investigaciones Biológicas del Noroeste (CIBNOR, Mexico) and Nadia Rubio (CIBNOR). DNA extraction and molecular sexing were determined using modifications of Aljanabi and Martinez (1997) and Richard *et al.* (1994), respectively. A complete report on the temporal and spatial distribution of female and male sperm whales in the Sea of Cortez is in preparation.

Photo-identification
Analog and digital photographs of the dorsal area and flukes of sperm whales are collected during each approach. When possible the flukes are photographed when the ventral surface is raised and is at a 90º angle to the camera's line of sight. The time, latitude and longitude, film roll, and frame numbers of the photographs are recorded on hard copy field forms and later entered into a computerized database. Analog photographs of sperm whales are taken using either a Minolta 9X1 or Minolta 7001 camera with Minolta 75 to 300 mm lenses and 400 ASA color print film. Digital images are taken using a Nikon Coolpix E950 with a wide angle lens. Digital videos of sperm whale approaches are taken opportunistically using a Canon XL-1 DV video camera. Digital photos and video images are used in short-term identification of individuals in the field to help eliminate multiple sampling of a single animal. All photos and videos are archived for future analyses of whale population stocks and structure.

Acoustics
Acoustic detections of marine mammals are made onboard the R/V Odyssey in real time, using a 100 m or 300 m towed acoustic array, each consisting of two PVC-encased hydrophone units (Benthos AQ4, with Benthos AQ201 pre-amplifiers). The effective listening range is 3 to 6 nautical miles depending on ocean conditions, and on whether the vessel is motoring or sailing. The output signal is monitored 24 hr a day using speakers located in the pilothouse as well as during a stop every half hour (when not on biopsy effort) using high-quality headphones. All acoustic contacts with marine mammals are entered in Logger 2000 v. 2.20 (International Fund for Animal Welfare, IFAW). The number of sperm whales clicking within the detection range of the hydrophone is calculated by Rainbow Click v. 1.03 (IFAW) for each encounter. Spatial bearing of each animal is automatically calculated by Rainbow Click using the time of arrival differences between receptions of clicks on two hydrophone channels. In addition, source parameters of marine mammal phonations are estimated

with a state of the art, wide band, calibrated recording system consisting of three Reson TC4032 hydrophones that relay signals, via an amplifier/filter unit, to a 12 bit digital recorder (Wavebook 512) with a recording bandwidth of 160 kHz. This system sheds light on cetacean sound production, communication and echolocation in off-shore marine hanitats. All marine mammal acoustic detections as well as recordings of other relevant sounds (seismic signals, wind noise, ship traffic, etc.) have been archived on CDs. The sperm whale acoustic data have also been extracted from the raw data and archived separately for further analyses.

Additional Biological Sampling

Sloughed skin: Naturally sloughed sperm whale skin is opportunistically collected and used for genetic analysis.

Squid and squid beaks: Whenever possible, squid are collected at locations where sperm whales have been successfully biopsied. Squid beaks are collected opportunistically when a sperm whale is observed defecating at the surface. Beaks will serve for identification of prey species while squid samples are preserved for stable isotope and chemical analyses.

Fish*:* Samples from fish species that are of commercial or ecological importance are collected opportunistically and preserved for stable isotope and chemical analyses. The dorado *Coryphaena spp.* and tuna *Thunnus spp*. have been the most prevalent species collected to date.

Development of New Methodologies

Dosing protocol

We have designed a non-lethal dosing protocol using skin biopsy slices in order to investigate the inducibility of cetacean cytochrome P450 1A1 (Godard *et al.* 2003). The results of this protocol demonstrated a direct relationship between chemical concentrations and specific effects in P450 expression in sperm whales and therefore validated the use of CYP1A1 as a biomarker of contaminant exposure in cetaceans. This type of study would have been, until now, dependent on lethal or invasive sampling.

More specifically, a full dosing study using this new protocol was successfully completed on 50 sperm whales sampled in the Sea of Cortez and established that

1. CYP1A1 in cetaceans is inducible by betanaphthoflavone, a prototypical CYP1A1 inducer in laboratory animals and wildlife.
2. CYP1A induction in cetaceans occurs in three different cell types: endothelial cells, smooth muscle cells and fibroblasts.
3. CYP1A1 induction in smooth muscle and endothelial cells appears to be dependent on contaminant concentration.

This dosing protocol is currently being used to investigate the effect of other chemicals on sperm whales. We have recently completed the field component of a dosing study using the PCB 3,3',4,4' tetrachlorobiphenyl. Analyses of the samples are in progress. The protocol has a wide applicability and can be used for the whale species and chemicals or mixture of chemicals of interest. It may also prove very useful in studying the effects of chemicals on other endangered species for which common invasive toxicology protocols are not permitted.

Acoustic Tagging

A novel acoustic datalogger has been developed and deployed on sperm whales with a large suction cup to study their sound production at great depths. This datalogger contains an analog-to-digital converter that stores sound up to 30 kHz on a memory flash card along with UTC time and depth information. The housing of the tag is pressure resistant to a depth of 1500 meters and contains a VHF transmitter to locate the tag after it is released from the animal. Data from this study undertaken during VOO has led to publication of the first paper describing onboard sound recordings from a free ranging cetacean (Madsen *et al.*, 2002). We have demonstrated that the air driven sound production of sperm whales is unaffected by hydrostatic reduction of the air volumes contained in the nasal complex and in the lungs during deep dives. Furthermore it has been shown that sperm whales can regulate the acoustic output and frequency content of clicks during dives, and generate click types with significantly different properties suited for echolocation and communication respectively. These findings have shed light on the biomechanics of sperm whale sound production and yielded information on the acoustic ecophysiology of sperm whales with implications for management and conservation. The technical gains from this study will hopefully allow Ocean Alliance to develop more sophisticated tags with cameras that may prove useful in understanding how sperm whales navigate and catch their prey at great depths.

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ANNEX XX

FIN WHALE CONSERVATION ACTIVITIES

Actions to Promote the Conservation Status of Fin Whales in the ACCOBAMS Area

Discussion Paper

13 November 2003

This document represents a follow-up to the meeting on fin whale conservation which was held in Las Palmas in March 2003, in which a communication link was established among researchers who are actively engaged in fin whale research in the Mediterranean, to help creating a community of people sharing the goal of enhancing knowledge of the ecology and conservation status of *Balaenoptera physalus* in this region.

Goal of this document is to identify actions that may be thought as desirable in order to make progress in fin whale conservation in the ACCOBAMS Area (i.e., Mediterranean and Atlantic). This effort may help in the subsequent identification of possible actors, and to stimulate the drafting of a comprehensive ACCOBAMS strategy for fin whales, to be conducted in conjunction with the Pelagos Sanctuary as a Joint Work Programme between Agreements, where priorities are identified, proposals are drafted, and funds are raised.

List of possible actions

Actions	Conservation need	Methods	Possible coordinators
Draw a picture of fin whale use of both the Mediterranean Sea and the contiguous Atlantic	Having identified breeding and feeding areas and migration corridors, ensure that critical habitats are protected and potential or known threats are addressed	Satellite telemetry	
		Photo-identification database enlargement and analysis	
		Surveys in eastern Mediterranean	
Determine relationships between whales in the Mediterranean and in the Gibraltar/Atlantic area	Assess degree of genetic isolation of study populations to evaluate potential decline and extinction threats	Continue monitoring effort in Alborán – Gibraltar - Atlantic	
		Perform genetic comparisons between Mediterranean and Gibraltar fin whales	
Determine total population size in Mediterranean	Enable monitoring of population trends to avoid long-term decline of population	Line transect surveys	
		Photo-identification mark/recapture studies	
Determine total population size in contiguous Atlantic	Enable monitoring of population trends to avoid long-term decline of population	Line transect surveys	
		Photo-identification mark/recapture studies	
Describe feeding ecology throughout region	Enable knowledge and conservation need of prey resources	Promote observations in feeding areas	
		Perform fatty acid/stable isotope analyses on biopsies	
		Analysis of faeces	
		Telemetry (V-TDR)	
Collisions impact assessment	Determine if conservation actions are needed	See document on collisions	
Whale watching impact assessment	Determine if conservation actions are needed	Energetic studies in feeding areas (e.g., Pelagos Sanctuary)	
		Designate experimental no-entry zones based on habitat use and monitor differential presence through time in experimental vs. control	
Anthropogenic noise impact assessment	Determine if conservation actions are needed	?	

ANNEX XXI

PHOTO-IDENTIFICATION TRAINING ACTIVITIES

Report of the Europhlukes Meeting

A meeting on Europhlukes took place in Tunis on the 2 October 2002 with the participation of representatives from CPEA (CIESM Panel of Experts for ACCOBAMS), EUROPHLUKES, Tethys Research Institute, IFAW and the ACCOBAMS Secretariat.

The representative from EUROPHLUKES, Simone Panigada, informed the meeting about the project telling that this is a CONCERTED ACTION funded by the European Commission under the Fifth Framework Programme which will run for 36 months and will be finished in October 2004. Aims of the project are:

- to develop a European cetacean photo-identification system as a facility for research on the sustainable management of the marine environment;
- to initiate a European network of providers and end-users of the European Cetacean photo-identification system;
- to ensure continued contribution of material and supportable use of the database.

Photo-identification is considered to be one of the least intrusive methods for gathering knowledge of cetaceans. It is a technique for identifying individual animals using photographs of distinctive natural markings. Knowing which animal was observed where, when, with whom and under which environmental conditions will provide the necessary knowledge for researchers and managers to protect cetaceans populations.

Simone Panigada mentioned in his presentation that the southern Mediterranean and Black Sea are currently not covered by photo-identification studies, and therefore they do not take part in the Europhlukes project. He also pointed out that the aims of the Europhlukes project do not provide funding for field work or training of researchers, which will be necessary to involve these countries in the project. The participation of other countries to the project, in particular from the Black Sea and North Africa would result in a great improvement of the project itself, by widening its geographical coverage to the entire Mediterranean and Black Sea areas, and therefore providing a detailed picture of cetaceans populations living in these areas.

After this introduction the meeting discussed the collaboration with the ACCOBAMS Secretariat in order to decide on how to extend to the entire ACCOBAMS area photo-identification capacity building. In the initial phase of the project, it was decided to limit capacity building only to those groups in which infrastructures exist. In order to verify which of these infrastructures exist it was decided to revise the “Draft Standard Information Sheet” (CMS 1/Doc.8) and to distribute it online and in printed form. The revision will consist of a list of the items to be included in the form. This revision will be performed by an *ad hoc* working group consisting of Giovanni Bearzi, Alexei Birkun, Stefan Braeger, Giuseppe Notarbartolo di Sciara and Simone Panigada, and will be submitted for adoption by the Scientific Committee.

While the funding of this aspect of capacity building will be included in a wider effort, it was considered that an initial pilot project could be developed in May 2003 in Ukraine with the cooperation of Alexei Birkun and his team.

ANNEX XXII

TISSUE BANKS

Establishment of a System of Tissue Banks

Report on activities conducted on Action 18 arising from SC1:

Alex Aguilar, Department of Animal Biology, Faculty of Biology, University of Barcelona, Spain

and

Daniel Cebrian, UNEP-MAP Regional Activity Centre for Specially Protected Areas (RAC/SPA), B.P. 337-1080 Tunis cedex, Tunisia.

Background

The first meeting of the parties identified the necessity of creating central repositories of cetacean tissues, also known as *tissue banks*, to provide researchers and managers with comprehensive collections of samples that may be used as a cost-effective diagnostic tool for toxicological, pathological and genetic studies. At that time, two tissue banks of this type were in the process of creation: one at the University of Barcelona, Spain (designed for toxicology and genetics) and another at the University of Padova, Italy (designed mostly for pathological and health-related studies). It was felt that coordination between these and any further initiatives was a priority, and that the geographical scope of the bank system should be enlarged to cover the entire Agreement area, Black Sea included.

At the first meeting of the Scientific Committee, documents describing the profile and activities of these banks were presented (SC1 documents 20 and 21) and it was recommended that a workshop to develop agreed sampling and conservation protocols, as well as to ensure effective networking between suppliers of samplers and potential users in the various ACCOBAMS countries, be organised.

Action taken: After SC1, the objectives of the workshop were further developed as to:

- Identify objectives, priorities of research and tissues to be stored
- Establish workable procedures for collection and storage of tissues
- Design protocols for exchange (see above) of samples
- Ensure co-ordination and exchange of samples among potential sub-banks

Establish a co-ordination unit

Attendance to the workshop was estimated at about 15 persons that should include a variety of disciplines and contain a good representation of the ACCOBAMS geographic area. Duration was determined as 2 working days.

Synergies were established with the UNEP-MAP Regional Activity Centre for Specially Protected Areas (RAC/SPA) to combine the tissue banking workshop with a short training course on sampling procedures for stranded cetaceans. Funds and resources could thus be optimised since some of the specialists attending the banking workshop could also serve as trainers at the course. Also, it was considered the convenience to hold the meeting either in the southern or in the eastern Mediterranean Sea in order to improve local skills and interest on cetacean research and conservation in these regions.

The Marine Biology Research Centre at Tajura, Libya, has been approached to act as hosting institution and, although final approval is pending, preliminary conversations are positive. The date of the meeting has been provisionally established in January 2004.

ANNEX XXIII

EMERGENCY TASK FORCE

Draft Concept Paper

Prepared for SC2 by
Giuseppe Notarbartolo di Sciara

During the First Meeting of the ACCOBAMS Contracting Parties in Monaco (28 Feb. – 2 March 2002) a number of implementation priorities were adopted, including one concerning the establishment of an "Emergency Task Force for special mortality events". The Parties recognised that "In recent years the Agreement area has been the scene of major cetacean mortality events, involving mass strandings over wide geographical areas, which have evoked great concern and have attracted considerable attention from the scientific community. To face possible new mortality outbreaks, as well as major accidental events affecting cetacean populations or their critical habitats, the establishment of a Task Force for marine mammal mortality and special events, formed by international experts, is highly recommended. When necessary, and if requested by the Secretariat, the Task Force will convene and arrange for a small team of experts to assess the situation on the ground and advise national groups. The development of intervention protocols and of code of conducts to be followed in case of emergency situations should also be included within the tasks of such group".

During the first meeting of the Scientific Committee in Tunis (3-5 October 2002) a discussion was made on the establishment of such task force: "After a brief discussion, in which several members pointed out the importance for the SC to provide precise indications on the type of scientific support, both preventive and as a follow up, in case of special events, it was decided to create a working group for this task within the following three months".

As a result, a Working Group (WG) was established composed as follows: Mark Simmonds (Coord.), Alex Aguilar, Stefan Braeger, Anastasia Komnenou, Toni Raga.

To stimulate progress in the accomplishments of such WG, the present concept paper is presented to SC2 for discussion. The following steps are proposed to the WG, in order to support the expeditious implementation of an ACCOBAMS Emergency Task Force (ETF):

(1) Preparation of a list of the possible events for which the ETF may be called upon. For example: epizootic outbreaks, massive oil- or chemical-spill in known cetacean critical habitat, cetacean mass mortality of unknown cause, etc. For each event type, the WG arranges for a set of protocols and guidelines detailing actions that the ETF should undertake, as soon as it is notified of the event. It is highly recommended that government disaster management experts be informally consulted to acquire basic tips on the organisation of such tasks.
(2) Establishment of the ETF: peparation of a roster of contact persons and experts from a number of appropriate fields of expertise (not necessarily members of the ACCOBAMS SC), who agree to volunteer and remain on call in case of emergency, and familiar with the instructions detailed in the above mentioned protocols and guidelines. Different experts may be designated for different event types, as needed. Emergencies might be generally addressed by putting ETF members in contact with local correspondents or officials on the site of concern, to provide guidance and assistance by telephone or email, and only in exceptional cases by dispatching one or more ETF members on the event site.
(3) Periodical updating of protocols and guidelines, based on past experiences and the availability of new techniques and technologies.
(4) When appropriate, organisation of training and exercises to enhance the effectiveness of the ETF.
(5) Support to the Permanent Secretariat in the preparation of the budget for an emergency fund, to enable the timely implementation of the ETF activities, whenever and wherever these may be needed.

ANNEX XXIV

STRANDINGS PROTOCOL AND DATABASE

Protocol on strandings and database: progress report

In relation to MEDACES, we provide a brief information concerning this project:

A Mediterranean Database of the Cetacean Strandings (MEDACES) has been created to co-ordinate all national and regional efforts for riparian countries. This project was created under the Barcelona Convention and it is currently with the support of the Spanish Ministry of Environment. The importance of MEDACES is twofold: (1) For the first time, all the cetacean stranding data will be gathered in a single database. The current dispersion of the information in different countries will be concentrated in a single place. Researchers, civil servants and people interested in the biology and conservation of Mediterranean cetaceans will have access to information on stranding location, characteristics of the stranded animals, and the storage institutions, where samples from these mammals are kept for future analyses and studies; (2) Following the most modern databases, distribution maps will be produced using a Geographical Information System (GIS). MEDACES is set-up at the University of Valencia (Spain). Information will be accessible online through a web site.

Given the differences in the level of coverage of cetacean strandings between the Mediterranean countries, two levels of data collection have been proposed. At the first level, basic information will be collected and this will be common to all the stranding networks; e.g. date and location of stranding, length, weight and sex of the animal, measurements, etc. The second level refers to more complex data and may vary as a function of the logistic and technical possibilities of each country. This information deals with the collection of samples for parasitological, toxicological, bacteriological, pathological and/or virological studies. The following colleagues reviewed the form to collect stranding data: Alexei Birkun (BREMA Laboratory, Ukraine), Daniel Cebrián (RAC/SPA, Tunis), Dan Kerem (IMMRAC, Israel), Michela Podesta (Museo di Storia Naturale di Milano, Italy), and Marina Sequeira (Instituto da Conservação da Natureza, Portugal). Giuseppe Notarbartolo di Sciara coordinated the revision of the form.

This form will be accessible at the MEDACES web page. The provisional web page (still under construction) is **http://medaces.uv.es.** Moreover, an executable program for those countries with no connection to Internet has been developed to facilitate the sending of stranding data. A pdf document (paper format) will be also created for those countries with no accession to computers.

The relational database has been designed as a Geodatabase (from ESRI enterprise, the leader company in GIS) which is established in Access format. The Geodatabase is the characteristic format of the Geographical Information System (GIS) of MEDACES. The Geodatabase is one of the leading formats in GIS world. In a relational database, data are organised as tables of values, and all the operations are based on tables. This is an excellent way to store data efficiently. The different sort of information of every stranding record will be stored in different tables which will related. For instance, the data about the Institution sending the stranding information, cetacean measurements, and samples taken for bacteriology studies will be stored in three different tables. One of the advantages of using a relational database is to facilitate the query of complex information within the database that otherwise it would be a difficult task.

The GIS is being designed with ArcGis package. These programs design the GIS which will allow the view of strandings on a cartography, to make spatial analyses, and visualise the information of the database related to those strandings. The web page will have a viewer that will allow the user to create their own map compositions from the information in the database. The queries requested to the database can be reflected on a map. Moreover, a section with maps elaborated by MEDACES will be available.

MEDACES is ready to gather information on cetaceans strandings from the riparian countries. Along next months, data corresponding to year 2001 should be provided by a National Focal Point (NFP) in every country, through the RAC/SPA to MEDACES.

- During the SC1 it was proposed to extend MEDACES to the entire ACCOBAMS area. Although this point is still in discussion, it will be feasible in a medium-term period. For instance, the Marine Mammal Data Base for the Romanian Black Sea Coast (MMDB) is in the process of achieving a data exchanging between the MMDB and MEDACES

- According to Agenda item 8.50 of the SC1, it was proposed the adoption of a code of deontology related to MEDACES. The ACCOBAMS Secretariat was invited to collaborate with the RAC/SPA to achieve the necessary harmonisation between RAC/SPA and ACCOBAMS concerns. As a result of this collaboration, the final version of the deontological code we provide to the SC2 is as follows.

Deontological code of the Mediterranean Database of Cetaceans Strandings (MEDACES)

The following Deontological Code defines the principles and the norms that all MEDACES contributors are called to observe and fulfil:

- MEDACES is an international scientific service related to research and management for the conservation of cetaceans in the Mediterranean Sea. With the support of ACCOBAMS, the Database will cover the whole Agreement area.

- The Regional Activity Centre for Specially Protected Areas (RAC/SPA) of the Mediterranean Action Plan, UNEP, will act as depository and trustee of the database. The RAC/SPA might delegate its management to a public institution of a Mediterranean country.

- In accordance to the MOU between ACCOBAMS and RAC/SPA, ACCOBAMS scientific Committee and RAC/SPA will establish a working group to filter and validate the information submitted.

- The information will be submitted to the database annually by individual authors or, preferably, through the different SPA National Focal Points of the UNEP’s Mediterranean Action Plan and National Co-ordinators for ACCOBAMS

- Each author will have the right to free use of the information submitted by him after submission to the database.

- Persons other than authors will not make use of the data registered to MEDACES for scientific publications, unless permission is given in written by them and MEDACES managers. In order to safeguard the property of the data MEDACES will record the authors of every data

- A report will be periodically published with the information provided to MEDACES, being the researchers or institutions contributing to the database co-authors of such reports.

- The public, through an Internet web site, will have access to data deposited by researchers of the different states.

- The database will be in French and English, and the submissions should be in these languages.

ANNEX XXV

STRANDINGS PROTOCOL AND DATABASE

Towards an Agreement-wide Cetacean Stranding Network in the ACCOBAMS Area

Discussion Paper

Prepared for SC2
by Giuseppe Notarbartolo di Sciara and Toni Raga

Cetacean strandings create an important opportunity for gathering knowledge on natural and human-induced mortality of cetacean populations, and providing a readily available source of precious additional information on the biology, pathology, toxicology and population genetics of the concerned species (Perrin and Geraci 2002).

The Conservation Plan of ACCOBAMS requests Parties, among other things, to develop systematic research programmes on dead, stranded, wounded or sick cetaceans to determine the main interactions with human activities and to identify present and potential threats (*Paragraph 4d*); to develop systems for collecting data on by-catches, strandings, epizootics, and other related phenomena (*Paragraph 5a*); and to establish databanks for the storage of the information collected (*Paragraph 5e*).

During their first meeting (Monaco, Feb. – March 2002), the Parties to ACCOBAMS recognised (*Resolution 1.9, Annex 1, Action 15*) that stranding networks exist in the Agreement area, with various degrees of development regarding their spatial and temporal coverage, efficiency, and institutional involvement. The Parties therefore agreed to endeavour to improve the efficiency, when needed, of such networks, to help extending the appropriate know-how to countries where strandings are currently not monitored, and to create the basis for the establishment of a wider network at the regional level.

Accordingly, the Monaco Meeting adopted Resolution 1.10 (*Cooperation between national networks of cetacean strandings and the creation of a database*), which recommended, among other things, that: (a) each Party, individually, implement a stranding network; (b) national networks be coordinated and common databases created; (c) other riparian countries of the region be invited to participate in such actions; and (d) the SC were to approve a general protocol, a deontological code, and a <u>definition of practical methods for setting up the region-wide network</u>.

The aim of this discussion paper is to suggest possible ways in which the SC may facilitate reaching the main **goal:** <u>to create an **Agreement-wide stranding network (AN)** that enables a thorough reporting across the Agreement area, along the entire coastline as well as at sea, of the findings of dead, injured or sick cetaceans</u> (see Summary). A general protocol and a deontological code have been developed during the SC 2002-2003 intersession, and are presented at SC2 in Istanbul. In order to reach the stated goal, however, a more comprehensive approach is needed, detailing the following **objectives** (see Summary):

a) Maintaining a register (database) of the animals found, inclusive of the following information on such specimens:
   i) <u>Essential information</u>: species, sex, length of each specimen, and date and location of finding;
   ii) <u>Desirable information</u>: likely or known cause of stranding/death, age, health condition of the specimen;
b) Collecting biological samples for storage in Tissue Banks (TB) and furthering pathological, toxicological or genetic investigation;
c) Providing the best possible response whenever live strandings occur;
d) Supporting the Emergency Task Force (ETF) in the case of unusual mortality events.

Implementation. The AN goal can only be attained by first ensuring that stranding **networks at the national level (NNs)** are established and implemented in Member and Range States . At present, the situation in the Agreement area is quite heterogeneous. In some countries a functional NN exists (although in most cases with minimal or no involvement of the governmental authorities), covering most or all of the national area; in other countries, networks only cover part of the national area; finally, most countries have no network at all, and stranded cetaceans are reported at best on an occasional basis.

Therefore, in order to attain the AN goal and objectives, the following **Actions** may be envisaged (see Summary):

1. A minimum NN standard (essentially to reach Objective a-i) should be agreed upon and detailed in a protocol.
2. Member and Range States should be encouraged to adopt the NN standard.
3. NNs should actively be promoted and implemented, initially at least to the minimum standard (Action 1 above) in all the States where no network currently exists.
4. Efforts should be made to enable NNs to reach the greater objectives (a-ii to d, above).
5. Homogeneity should be promoted among different NNs to facilitate functioning under the wider umbrella of an AN.
6. The AN should be constantly improved by taking advantage of the enhanced power and opportunities afforded by a regional enlargement.

Comments on the Actions

The six Actions listed above do not need to be implemented in the given sequence. For example, Action 1 can be implemented in one country while Action 4 may be implemented in another.

Action 1. Agreement on a minimum NN standard.

A regional stranding protocol is already being developed within ACCOBAMS, and distributed to SC2 ("Guidelines for the Development of National Networks of Cetacean Strandings", by J.A. Raga). This protocol already provides basic guidance for the functioning of a NN, and a detailed description of the operations to be performed once the response team has reached the animal ("Specific guidelines"; see also Geraci and Lounsbury 1993).

However, two additional components of the system are also needed at this time if the goal is to be reached:

- There is a need for a more detailed description of procedures to convey the information of the stranding from the event site on the periphery to an operation centre, and from there to the nearest response team so that the animal is reached in the shortest delay. In this respect, practical experiences exist in the Agreement area (e.g., see Notarbartolo di Sciara et al. 1986 for a description on how a NN was set up in Italy in 1985, and Borri et al. 1997 for a summary of the network's achievements after 10 years of operation at no-cost to the taxpayer). Critical steps include: (a) capillary dissemination of the information on the existence and functioning of the NN along the nation's coastal zone, with special attention to coastal officials but also to the fishing, boating and tourist communities, and details on how to deal with and report a stranding event; (b) organisation of the operation centre; and (c) organisation, training and funding of an adequate number of response teams which are strategically located on the territory in order to cover the entire area and ensure timely intervention.
- In the past, governmental institutions (e.g., in Italy) have in many occasions been benefited by the volunteer-based, science-stimulated work of NNs, but without providing to such NNs support,

either in terms of infrastructure availability, legal facilitation, or funding. With ACCOBAMS in place, this cannot happen anymore in Member States. Institutional involvement is fundamental, and full support should be given to establish the NNs, their funding, infrastructural availability, and the provision of a legal framework whereby operations are conducted in accordance with national and international law.

Action 2. Adoption of NNs by Member States and Range States.

Having included a specific recommendation to this effect in Resolution 1.10, the Meeting of the Parties of ACCOBAMS is expected to urge Member as well as Range States to establish NNs.

Action 3. Promotion and implementation of NNs where there is none.

As a direct consequence of Action 2, expert support from the SC in terms of ad hoc capacity building programmes will be needed by States that have decided to establish and implement a NN. The action should strive to set up NNs with a complete system of information relay (periphery – centre – periphery), the strategic positioning of response teams connected with scientific infrastructures (e.g., museums, university institutes, government research laboratories, etc.), and the collection of minimal stranding data (i.e., species, sex, length, date and location of stranding).

Action 4. Improvement of NNs to reach the greater objectives.

Capacity building programmes will have to be continuously implemented also in States where NNs are already working to improve their functioning and geographic coverage, and to enable the involvement of institutions capable of: (a) performing necropsies on stranded animals to determine the cause(s) of stranding and death, ascertaining the existence of pathologies, assessing health condition and parasite loads , and estimating the age of the animals; (b) collecting biological samples for storage in Tissue Banks (TB), and furthering pathological, toxicological or genetic investigation; (c) providing the best possible response whenever live strandings occur; and (d) supporting the Emergency Task Force (ETF) in case of unusual mortality events.

The SC will ensure that all these efforts will be conducted with due scientific standards, and in close coordination with the Emergency Task Force and Tissue Banks.

Action 5. Functional enlargement of NNs under the wider umbrella of an AN.

This action envisages coordination mechanisms to promote cooperation and exchange of information among the Agreement Range States. As stated in the Conservation Plan, this action should be conducted in concert at the regional and sub-regional levels, with support from the Agreement Secretariat, the Coordinating Units and the SC, and carried out in cooperation with competent international institutions and organisations. The core of the action could be an unified stranding database managed by the Secretariat. MEDACES, the Mediterranean Stranding Database promoted by the RAC/SPA and currently under construction by the University of Valencia, will be enlarged to the Black Sea and to the Contiguous Atlantic Area, and is set to become such centralised database. Workshops and special training courses on this topic may be periodically organised as well.

Action 6. Improvement of the AN to take advantage of the enhanced power and opportunities afforded by a regional enlargement.

This is clearly the main goal to be attained by Resolution 1.10. The action should include close interconnections with MEDACES and a regional system of tissue banks, the strengthening of a unified website, and participation in the effort of ensuring a smooth functioning of the ETF. In the end, as the ultimate goal of this effort, this action should contribute to the creation of a close-knit Agreement-wide community of stranding network managers and scientists.

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Summary

Goal	Create an Agreement-wide stranding network (AN) to enable a thorough reporting across the Agreement area, along the entire coastline as well as at sea, of the findings of dead, injured or sick cetaceans.

Objective a	Maintaining a register of the animals found, to enhance knowledge of cetaceans in the region, by securing scientific information on specimens
Sub-objective a-i	Essential information: species, sex, length, location, date
Sub-objective a-ii	Desirable information: age, health condition, contamination levels, cause of stranding/death
Objective b	Collecting biological samples for storage in Tissue Banks (TB) and furthering pathological, toxicological or genetic investigation
Objective c	Providing the best possible response whenever live strandings occur
Objective d	Supporting the Emergency Task Force (ETF) in case of unusual events

Action 1	Agreement on a minimum NN standard (to reach objective a-i)
Action 2	Adoption of NN by Member and Riparian States
Action 3	Promotion and implementation of NNs where no network currently exists
Action 4	Improvement of each NN to reach the remaining objectives (a-ii to d)
Action 5	Functional enlargement of NNs under the wider umbrella of an AN
Action 6	Improvement of the AN

ANNEX XXVI

JOINT WORKING PROGRAMME CBD/CMS AND GROMS

CBD/CMS Joint Working Program, Global Register of Migratory Species (GROOMS): Progress Report

Working Group 10
Joint CMS/CBD Activities – GROMS

Summary of input from WG10 members:

Giuseppe Notarbartolo di Sciara (coordinator)
Alexei Birkun, Jr.
Stefan Bräger
Juan-Antonio Raga
Marie-Christine Van Klaveren

ACTIONS HAVING HIGH PRIORITY

1.2.3. Forward CMS Resolution 6.2 (By-catch) to CBD; explore possibilities for future co-operation and subsequently implement (under objective 2.1).
1.2.4. Intensify dialogue and co-operation with the fisheries sector where there are known impacts on migratory species due to by-catch and contribute to the CBD's future work on by-catch case studies or a commissioned study on the magnitude of the threat.

Cetacean by-catch is a well-known phenomenon in the ACCOBAMS area, and involves all species known from the region, two of which (sperm and fin whales) are listed in CMS Appendix I. Pelagic species, such as sperm whales and striped dolphins, are thought to be particularly affected by driftnets, still extensively used in the area. ACCOBAMS SC (hereafter, "SC") experts can provide specialised support to all items listed in CMS Resolution 6.2. The establishment of a by-catch database was identified as a priority by ACCOBAMS MOP1 (hereafter, "MOP"); furthermore, a recommendation on bycatch (SC1 Recommendation 1.2) was adopted by SC, concerning, among other things, the commissioning of a study (pending funding availability) of the current knowledge regarding the extent and magnitude of cetacean by-catch in the Agreement area; a request all Parties and Range States to provide to the Secretariat on an annual basis estimates of cetacean by-catches through their fishing operations; and the participation of ACCOBAMS in the efforts undertaken by the European Commission on by-catch. The related topic of competitive interactions between coastal dolphins and artisanal fisheries is also being addressed by SC, and a recommendation on acoustic devices (SC1 Recommendation 1.1) was adopted, warning on the dangers deriving from the abuse of pingers and acoustic harassment devices. An *ad hoc* WG (WG3) was created, with the task of collecting relevant information on the existence of problem areas in which damage from cetaceans to fishing or aquaculture activities occur.

1.2.7. Taking concerted actions in favour of the endangered marine birds, mammals and reptile species listed in CMS Appendix I that are not adequately covered by other instruments as appropriate.

Fin whales and sperm whales are CMS Appendix I species regularly found in the ACCOBAMS Area, and to which ACCOBAMS applies. These species are affected, or potentially affected, by a number of serious threats (e.g., collisions with vessels, high-level industrial and military noise, chemical pollution, unregulated whale watching, and, particularly in the case of sperm whales, accidental entanglement in driftnets) which may not be adequately addressed by other instruments as appropriate. ACCOBAMS must address all these issues, and support from CMS and CBD would be very needed; in turn, ACCOBAMS' experience may be useful as a case study for addressing these problems elsewhere.

1.3.1. Include expertise on migratory species and marine and coastal protected areas in the CBD ad hoc technical experts group to support CBD Operational Objective 3.1[27].

MOP identified as a priority the development and implementation of pilot conservation and management actions in well-defined key locations in the ACCOBAMS Area containing critical habitat for populations belonging to priority species. Marine protected areas designated to protect cetaceans exist in the ACCOBAMS Area, and more are in the planning. The ACCOBAMS Area also includes one of the few existing MPA established in the high seas, the Cetacean Sanctuary. SC has specific expertise in the field of cetacean conservation through MPAs. A Joint Working Programme is being initiated between ACCOBAMS and the Agreement on the International Sanctuary for Mediterranean Marine Mammals, based on SC Recommendation 1.3, to harmonise research activities on fin whale ecology and conservation in the Mediterranean. SC is available to cooperate with the CBD ad hoc technical experts group and propose nominations accordingly.

1.3.2. Review CMS Instruments and include information about those instruments and about the special needs of migratory species in the documents of the ad hoc technical expert group on marine and coastal protected areas.

SC is available to assist ACCOBAMS Executive Secretary (hereafter ES) in participating in the consultation with adequate knowledge.

6.1. Provide case studies on the relationship between migratory species and the prevention of introduction, eradication or control of alien invasive species, pursuant to the format annexed to CBD COP Decision V/8, compile them and make them available to Parties through CHM.

Although ongoing or completed projects involving case studies on the relationship between cetaceans and alien invasive species may not exist at the moment in the Agreement Area, these can be envisaged if needed. Case studies on alien invasive species may involve habitat-altering species such as *Caulerpa* spp. and the connected fish (=prey) fauna in Mediterranean coastal habitats, or invasive carnivorous zooplankton in the Black Sea and its effects on the pelagic trophic web. From a different angle, cetaceans from geographically identifiable populations (e.g., Black Sea *Tursiops*) released outside their range (e.g., the Red Sea, as in Israel), may pose problems of interest to this action.

7.1. Provide case studies to be compiled by the secretariats on the relationship between the ecosystem approach and the conservation and sustainable use of migratory species taking into consideration the migratory range approach and make them available through CHM.

By "sustainable use" of migratory species we intend here only intentional use, thereby excluding instances such as bycatch that are being addressed elsewhere in this document. Based on such definition, sustainable use of cetaceans in the ACCOBAMS Area can only be non-consumptive and non-lethal. Whale watching may fall within such a category of use. ACCOBAMS is finalising the development of guidelines for respectful whale watching, and is setting up a web-based database for the acquisition of information and inventorying of commercial whale watching operations in the Agreement area.

[27] *CBD Operational objective 3.1*: "To facilitate research and monitoring activities related to the value and the effects of marine and coastal protected areas or similarly restricted management areas on sustainable use of marine and coastal living resources."

8.1. Consider how GROMS could be developed to most effectively contribute to the implementation of the CBD GTI and CMS.

A major operational problem in the ACCOBAMS Area resides in the lack of knowledge of the distribution (and seasonal variations thereof) of cetacean populations in a large portion of the area itself, both in the Mediterranean (particularly as far as the southern and eastern portions are concerned) and in the Black Sea. Thus a considerable effort is now being placed in organising a Mediterranean-wide survey, conducted both with visual and acoustic methods, to assess such population distribution. Furthermore, stranding programmes and databases are being carried out in parts of the area, but are lacking elsewhere. Therefore an effort is being undertaken under the auspices of ACCOBAMS, in cooperation with UNEP MAP's Regional Activity Centre for Specially Protected Areas of Tunis, for the establishment of an umbrella stranding network encompassing the entire Agreement range, and consequently for the creation of a Mediterranean (and Black Sea) database of cetacean strandings (MEDACES). Both initiatives (surveys at sea and stranding database), when completed, will be able to contribute significantly to the GROMS effort. At the moment, however, such initiatives are not implemented due to lack of funds.

8.2. Identify experts on migratory species and taxonomy from the roster of experts under CBD and CMS to participate in the short-term GTI activities.

ACCOBAMS is creating a directory of its experts. From such a directory, ad hoc experts from the ACCOBAMS area can be provided for this task.

9.1. Identify experts on migratory species as indicators that could be included on the CBD roster of experts and the expert meeting on indicators.
9.3. Provide case studies, best practices, guidelines, reviews, reports and data on the use of migratory species as indicators of biological diversity and their use in assessment and monitoring programmes (i.e. AEWA guidelines to reduce damage to fisheries and other forms of conflict between water birds and human activities, guidelines on bat-friendly forestry practices under the Agreement on the Conservation of Bats in Europe (EUROBATS), to support the regional process of workshops on indicators, and contribute to the implementation of CBD COP decision V/7 on developing a set of principles, standard questions and a list of available and potential indicators.

Air-breathing marine animals such as mammals and turtles are significantly easier to study than non-air breathers because the former are linked to the sea surface (and therefore visible) by their constant physiological need for atmospheric oxygen. In addition, as long-lived, top marine predators, able to accumulate toxins in their tissues through biomagnification, cetaceans can be regarded in some cases (e.g., when detecting trends over short periods is not a stringent need) as useful indicators. The ACCOBAMS Black Sea Sub-regional Coordinating Unit is active on this item, as marine mammals are likely to be used as indicators (e.g. by Ukraine). Several ACCOBAMS species could be thus be selected as possible bioindicators, and as a consequence ACCOBAMS experts are available for inclusion in the CBD roster of experts.

10.1. Organize a technical workshop or a commissioned study examining migratory species and impact assessment, including the problems posed by obstacles to migration, as an input into the CBD process.

There is a number of human activities in the ACCOBAMS area that are known to or likely to impact on cetaceans, and particularly on two Appendix I species (fin and sperm whales). Fishing with driftnets, navigation with high-speed ferries and airgun prospecting are just few examples. While recognising the difficulties involved (particularly as far as funding and the ability to reach rapid conclusions are concerned), studies to assess impact on such species would be very useful, and ACCOBAMS has the expertise to carry out such studies, which will be part of specific conservation plans envisaged by MOP and currently in preparation.

11.4. Give particular attention to CMS Appendix I species when creating networks of critical sites or corridors throughout the migratory range of the species concerned, in close co-operation with other Range States, particularly neighbouring States.

The International Sanctuary for Mediterranean cetaceans, which entered into force in February 2002, contains major critical habitats for all regular Mediterranean cetacean species, and in particular for CMS Appendix I fin and sperm whales. The Scientific Committee of ACCOBAMS adopted in 2002 a recommendation to cooperate with the Mediterranean Cetacean Sanctuary Agreement to investigate the location of other critical habitats for these species in the Mediterranean, and ensure that migratory movements among such habitats can occur unimpeded along appropriate "corridors". Once identified, sites and corridors could be proposed as restricted/controlled fishing, navigation and mineral prospecting protected areas to alleviate bycatch, collision and noise problems. Funding for the implementation of such activities is seen as a priority in the ACCOBAMS area.

14.1 Provide case studies to be compiled by the secretariats on the sustainable use of migratory species and their economic value to support the development of CBD principles and guidelines.

Sustainable use of cetaceans in the ACCOBAMS area can only be non-lethal, non-consumptive (i.e., whale watching). ACCOBAMS MOP1 has adopted guidelines for respectful whale watching, which are currently being revised by an *ad hoc* Working Group established by ACCOBAMS Scientific Committee. It is thus possible for ACCOBAMS to contribute to the support of CBD principles and guidelines in matters concerning the sustainable use of migratory species and their economic value.

19.4. Ensure that National Reports of CMS and Agreements are made available for consideration in CBD decision-making.

The Scientific Committee of ACCOBAMS is available to support the Secretariat in the implementation of this task.

ACTIONS HAVING MEDIUM PRIORITY

1.1.1. Review CMS Instruments for their relevancy to IMCAM to support operational objective 1.1 (CBD Decision IV/5)

Integrated Marine and Coastal Management (IMCAM) is highly relevant with a view of ensuring conservation of endangered populations of coastal cetacean species in the ACCOBAMS area, and most notably common and bottlenose dolphins, and harbour porpoises. Actions related to ACCOBAMS MOP1-adopted Implementation Priorities n. 4 ("Development and implementation of pilot conservation and management actions in well-defined key areas containing critical habitat for populations belonging to priority species"), 5 ("Workshop on methods for the evaluation of habitat degradation and its effects on cetacean populations"), 6 ("Conservation plan for cetaceans in the Black Sea"), 7 ("Conservation plan for short-beaked common dolphins in the Mediterranean Sea"), 8 ("Conservation plan for bottlenose dolphins in the Mediterranean Sea") should be best framed within the greater objectives of IMCAM. Proposals of pilot conservation and management areas (Action 4, above) should be considered as examples of IMCAM having a specific conservation objective (i.e., conserving an endangered marine mammal population).

6.2. Make available to the CBD guidelines by the CMS Instruments, such as AEWA, relevant to migratory species and the prevention of introduction, eradication or control of alien invasive species

Although ongoing or completed projects involving case studies on the relationship between cetaceans and alien invasive species may not exist at the moment in the Agreement Area, these can be envisaged if needed. Case studies on alien invasive species may involve habitat-altering species such as *Caulerpa* spp. and the connected fish (=prey) fauna in Mediterranean coastal habitats, or invasive carnivorous zooplankton in the Black Sea and its effects on the pelagic trophic web. From a different angle, cetaceans from geographically identifiable populations (e.g., Black Sea *Tursiops*) released outside their range (e.g., the Red Sea, as in Israel), may pose problems of interest to this action.

9.2. Evaluate how GROMS could contribute to the CBD's work programme, including the development of regional and global assessments of biodiversity (e.g., the Global Biodiversity Outlook)

A major operational problem in the ACCOBAMS Area resides in the lack of knowledge of the distribution (and seasonal variations thereof) of cetacean populations in a large portion of the area itself, particularly as far as the Mediterranean is concerned. Thus a considerable effort is now being placed in organising a Mediterranean-wide survey, conducted both with visual and acoustic methods, to assess such population distribution. Air-breathing marine animals such as mammals and turtles are significantly easier to study than non-air breathers because the former are linked to the sea surface (and therefore visible) by their constant physiological need for atmospheric oxygen. In addition, as long-lived, top marine predators, able to accumulate toxins in their tissues through biomagnification, cetaceans can be regarded in some cases (e.g., when detecting trends over short periods is not a stringent need) as useful indicators. The ACCOBAMS Black Sea Sub-regional Coordinating Unit is active on this item, as marine mammals are likely to be used as indicators (e.g. by Ukraine). Several ACCOBAMS species could be thus be selected as possible bioindicators of environmental change, and as a consequence ACCOBAMS experts are available for inclusion in the CBD roster of experts. Furthermore, stranding programmes and databases are being carried out in parts of the area, but are lacking elsewhere. Therefore an effort is being undertaken under the auspices of ACCOBAMS, in cooperation with UNEP MAP's Regional Activity Centre for Specially Protected Areas of Tunis, for the establishment of an umbrella stranding network encompassing the entire Agreement range, and consequently for the creation of a Mediterranean (and Black Sea) database of cetacean strandings (MEDACES). Both activities (surveys at sea and stranding database), when completed, will be able to contribute significantly to the GROMS effort. At the moment, however, such initiatives are not implemented due to lack of funds.

9.4. Organize a technical workshop or a commissioned study examining migratory species as indicators and contribute to the work of the SCBD on developing a set of principles, standard questions and a list of available and potential indicators (Decision V/7)

See previous item. ACCOBAMS could be available to supply both experts and/or contributions to such a workshop.

11.1. CMS to provide expertise on migratory species and contribute to the CBD's future work programme on protected areas including peer review of CBD papers, the participation in experts meetings and submission of case studies or commissioned studies on the value of protected areas to migratory species

We should explore the possibility that CMS could promote the case of high-seas marine protected areas to conserve threatened populations of migratory species, particularly those listed in CMS

Appendix I. The ACCOBAMS Area contains a pioneering example of this, the Ligurian Sea Sanctuary, and expertise developed in this process should be made available to CBD. Furthermore, protected (no-fishing) areas, especially the creation of new sanctuaries to form a network of protected areas and corridors of critical habitat for migratory species, may be a useful tool to alleviate by-catch problems. The study of the effect of no-fishing zones (protected areas) as they may exist in Malta, Spain or Algeria on cetacean populations should be encouraged. Finally, the funding of the basin-wide survey could have a high priority for CBD/CMS to identify critical sites and corridors. ACCOBAMS will be able to assist CMS in such an effort.

11.2. Gather information on the relationship between protected areas and the conservation and sustainable use of migratory species.

See previous item.

11.3. Develop pilot projects and research initiatives assessing the effect of protected areas on the conservation and sustainable use of migratory species (operational objective 3.2 of marine and coastal programme of work; elements 1 and 4 of the work programme for forest biological diversity)

Pilot projects and research initiatives aimed at the assessment of the effect of MPAs on the conservation of cetaceans and on their non-lethal, non consumptive use (i.e. whale watching) can be readily programmed within the framework of ACCOBAMS Implementation Priority n. 4 ("Development and implementation of pilot conservation and management actions in well-defined key areas containing critical habitat for populations belonging to priority species"), as well as n. 10 ("Identification of sites of conservation importance for fin whales").

11.5. Encourage research on the effects of protected areas or closed areas on population size and dynamics (operational objective 3.1 of marine and coastal programme of work)

See previous item.

13.1. Incorporating migratory species into the programme elements on education and public awareness (CEPA) being developed between CBD and UNESCO initiative as appropriate.

ACCOBAMS' Scientific Committee has created a working group for the establishment of a long-term training programme on cetacean research, monitoring and conservation (Implementation Priority n. 12). ACCOBAMS is also developing educational tools for the organisation of research projects and basic technical studies (Implementation Priority n. 13). The experiences acquired in these processes can be shared with the CEPA initiative, for mutual benefit.

13.2. Consider designating migratory species as a possible theme in the near future for the International Day of Biological Diversity

Important ACCOBAMS species, some of which listed in CMS Appendix I and II, could be designated on subsequent years "species of the year" to assist in fund-raising for conservation purposes. Another example could be the 20th anniversary of the total ban of cetacean kills in the Black Sea, which occurs in 2003, an opportunity for promoting awareness concerning ACCOBAMS in the Black Sea sub-region.

13.3. Promote awareness-raising, information sharing and training with regard to migratory species for stakeholders involved in sustainable tourism.

ACCOBAMS-adopted guidelines for whale watching, as well as future guidelines for sustainable use of cetacean habitat by shipping (ferries and cruise vessels), sport-fishing, water sports (jet skies, sailing etc.) and other 'stakeholders involved in sustainable tourism' can be provided to implement this action.

14.2. Determine the most appropriate means for migratory species and tourism to be addressed in the CBD work on sustainable tourism and contribution to the CSD Initiative

This action should be implemented in conjunction with the previous item.

14.3. Make available to the CBD when published, guidelines by the CMS Instruments, such as those by AEWA on (1) the development of ecotourism in wetlands, (2) the sustainable harvest of migratory waterbirds (3) regulating trade in migratory waterbirds and (4) reducing crop damage from migratory waterbirds

See previous item.

15.1. Integrate the conservation and sustainable use of migratory species into national biodiversity strategies and action plans.

The ACCOBAMS Secretariat can support CSM in this action, by interacting with Contracting Governments both directly and multilaterally (e.g., through for a such as the Advisory Committee of UNEP MAP's SAP BIO), to ensure that national legislation, strategies and action plans will include cetacean conservation in their objectives.

15.2. Integrate the conservation and sustainable use of migratory species into national decision-making especially across the competencies of governmental institutions

See previous item.

16.1. Support the implementation of the CMS Instruments as appropriate, to facilitate co-operation, collaboration and synergy.

CMS and CBD could support the implementation of ACCOBAMS by asking all their relevant Parties to become Parties to the Agreement (e.g. Lebanon, Egypt, Israel, Italy, France, Greece, Turkey, etc.).

16.2. Promote national-level cross-sectoral coordination to improve the conservation and sustainable use of migratory species, including co-ordination between the national focal points of the two conventions. Guidelines for sectoral and cross-sectoral integration can facilitate this activity

Synergies among CMS, CBD, and Bern, Barcelona and Bucharest Conventions could be used to stimulate exchanges, organise meetings, establish focal point committees promoting such cross-sectoral coordination. In this effort, ACCOBAMS Sub-regional Coordinating Units (SRCUs) could be particularly helpful.

19.1. Exchange and disseminate information on migratory species, including case studies, reports and others on the importance of migratory species in all thematic areas and crosscutting issues.

ACCOBAMS has already started to accumulate expert information (e.g., the report 'Cetaceans of the Mediterranean and Black Seas: state of knowledge and conservation strategies'; the ACCOBAMScience website at www.accobams.org, etc.) which can be disseminated to this effect. Furthermore, as part of its beginning effort in capacity building, SC is encouraging scientists from the area to make available their data through appropriate means (e.g., publications on journals such as the Journal of Cetacean Research and Management, participations in meeting such as those of the European Cetacean Society, etc.).

ACTIONS HAVING LOW OR NO PRIORITY

15.3. Develop national legislation for the protection and conservation of migratory species, as appropriate.

See item 15.1.

10.2. Include migratory species considerations in the guidelines for the integration of biodiversity considerations in impact assessments procedures.

See Item 10.1. Also, given that the ability to migrate is essential to migratory biodiversity, activities that may impact on migratory processes such as shipping, fishing, construction, navy exercises, and oil exploration should require a proper Environmental Impact Assessment study (required by national law). The results of a questionnaire on national legislation by ACCOBAMS in 2000 may be relevant here and possibly deserve to be updated for MOP2.

ANNEX XXVII

PRECAUTIONARY PRINCIPLE GUIDELINES

Some preliminary thoughts on the application of the precautionary principle to cetacean conservation within the ACCOBAMS area.

- William C.G. Burns, Assistant Professor, Department of Environmental Studies, University of Redlands & Chair, American Society of International Law – Wildlife Interest Group
- Mark Simmonds, Whale and Dolphin Conservation Society.

1. Introduction

The precautionary principle/approach has been characterized as "the most important new policy approach in environmental co-operation."[28] However, as we argue in section 2, the principle's potential to enhance the prospects for effective management and conservation of natural resources, including cetaceans, has been denuded by an absence of clear guidelines for operationalisation.

The purpose of this paper is to provide some suggestions for implementing the principle in the context of ACCOBAMS. In this pursuit, we will: 1. Provide a brief history of the genesis and development of the principle in the context of national environmental legislation and multilateral environmental agreements; 2. Consider some of the applications of the principle to some cetacean conservation issues; and 3. Make some tentative recommendations about the application of precaution in the ACCOBAMS context.

2. History/Contours of the Precautionary Principle

The precautionary principle initially emerged during the 1970s in the former West Germany. The essence of its early conception of *vorgorge* ("foresight" or "taking care") was the belief that environmental damage could be prevented or minimized through careful, forward-looking planning, as well as the adoption of "best practices" in environmental management.[29] The *vorsorgeprinzip* (precautionary principle) was used by the German government and other northern European countries to address many pressing issues in 1970s and 1980s, including North Sea pollution, acid rain and climate change.[30]

The principle emerged at the international level in the 1980s also. Since its first explicit incorporation in an international document in 1987,[31] the concept "has been included in virtually every recent treaty and policy document related to the protection and preservation of the environment,"[32] as well as in national legislation and regulations in many States.[33]

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[28] Ellen Hey, *The Precautionary Concept in Environmental Policy And Law: Institutionalizing Caution,* 4 GEO. INT'L ENVTL. L. REV. 303, 303 (1992).

[29] Timothy Riordan, *The Precautionary Principle in Contemporary Environmental Politics,* 4 ENVTL. VALUES 191, 193 (1995). *See also* Konrad von Moltke, *The Precautionary Principle,* ENV'T 2, April, 1992.

[30] *Id.*

[31] The London Declaration (1987): Ministerial Declaration. Second International Conference on the Protection of the North Sea (Nov. 24-25, 1987), <http://odin.dep.no/md/nsc/declaration/022001-990245/index-dok000-bn-a.html>.

[32] D. Freestone & E. Hey, *Origins and Development of the Precautionary Principle, in* THE PRECAUTIONARY PRINCIPLE & INTERNATIONAL LAW 3 (D. Freestone & E. Hey, eds. 1996). Examples of treaties and policy documents incorporating the precautionary principle include: Stockholm Convention on Persistent Organic Pollutants, 40 I.L.M. 532 (2001), at Preamble, art. 1; art. 8(7); art. 8(9), Annex C, Part V(B); World Trade Organization, Agreement on the Application of Sanitary and Phytosanitary Measures (1994), at art. 5(7); the United Nations Framework Convention on Climate Change, UNCED, Framework Convention on Climate Change, opened for signature, June 4, 1992, *reprinted in* 31 I.L.M. 849 (1992), at art. 3(3); the Convention on the Protection and Use of Transboundary Watercourses and International Lakes, 31 ILM 1312 (1992), at art. 2(5); the Convention on the Protection of the Marine Environmental of the Baltic Sea, 3 YIEL 1 (1992), at art. 3;

Intrinsic to the precautionary principle is an express rejection of a focus on the assimilative capacity of the environment, which heretofore held sway in the arena of international environmental decision-making.[34] The assimilative capacity concept emphasizes the ability of scientists to use predictive modeling to accurately ascertain the carrying capacity of, and the magnitude of threats to, the environment, as well as society's technological capacity to mitigate such threats once detected.[35] It also presumes that there is sufficient time to act to avoid harm from such threats once they have been detected.[36] However, revelations of unanticipated long-term damage associated with many substances that were heretofore presumed to be safe, including DDT and chlorofluorocarbons, put the lie to these assumptions.[37]

The precautionary concept advocates a shift away from the primacy of scientific proof and traditional economic analyses that do not account for environmental degradation. Instead, emphasis is placed on:

1) the vulnerability of the environment;
2) the limitations of science to accurately predict threats to the environment, and the measures required to prevent such threats;
3) the availability of alternatives (both methods of production and products) which permit the termination or minimization of inputs into the environment; and
4) the need for long-term, holistic economic considerations, accounting for, among other things, environmental degradation and the costs of waste treatment.[38]

"The precautionary principle can also be viewed as a safeguard against the opportunism of decision-makers in situations of asymmetric information or imperfect monitoring by society."[39] In the context of management and conservation of wildlife species, the principle reflects the recognition that "scientific understanding of ecosystems is complicated by a host of factors, including complex and cascading effects of human activities and uncertainty introduced by naturally chaotic population dynamics."[40]

The precautionary principle has been characterized as a "public policy guideline for environmental issues"[41] which "ensures that a substance or activity posing a threat to the environment is prevented from adversely affecting the environment, even if there is no conclusive scientific proof linking that particular substance or activity to environmental damage."[42]

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the Montreal Protocol to the Vienna Convention for the Protection of the Ozone Layer, *Protocol on Substances that Deplete the Ozone Layer,* 26 ILM 1541, 1551 (1987), at Preamble; and the Declaration of the Second International Conference on the Protection of the North Sea, *Ministerial Declaration Calling for Reduction of Pollution,* 27 ILM 835, 838 (1987), at Preamble, para. VII; art. XV(ii); art. XVI(1).

[33] Ylva Arvidsson, *The Precautionary Principle: Experiences from Implementation into Swedish Law,* IIIEE Reports, 2001:7 (2001), at 2, 9-10, <http://www.iiiee.lu.se/information/library/publications/reports/2001/Ylva-Arvidsson.pdf>, site visited on July 1, 2002.

[34] Hey, *supra* note 28, at 305.

[35] *Id.* at 306; Gregory Fullem, *The Precautionary Principle: Environmental Protection in the Face of Scientific Uncertainty,* 31 WILLAMETTE L. REV. 495, 497-98 (1995).

[36] Charmian Barton, *The Status of the Precautionary Principle in Australia: Its Emergence in Legislation and as a Common Law Doctrine,* 22 HARV. ENVTL. L. REV. 509, 511 (1998).

[37] W. Gullett, *Environmental Protection and the 'Precautionary Principle:' A Response to Scientific Uncertainty in Environmental Management,* 14(1) ENVTL. & PLANNING L.J. 52, 56 (1997).

[38] Hey, *supra* note 28, at 307.

[39] Arvidsson, *supra* note 33, at 11.

[40] Robert J. Wilder, *Precautionary Principle; Prevention Rather Than Cure,* Ocean 98, <http://www.ocean98.org/wilder.htm>, site visited on July 8, 2002.

[41] Norman Myers, *Biodiversity and the Precautionary Principle,* 22 AMBIO 74 (1993).

[42] James Cameron & Juli Abouchar, *The Precautionary Principle: A Fundamental Principle of Law and Policy for the Protection of the Global Environment,* 14 B.C. INT'L & COMP. L. REV. 1, 2 (1991). *See* 1992 Rio Declaration on Environment and Development, Principle 5, 31 I.L.M. 874 (1992) ("lack of full scientific certainty shall not be used a reason for postponing cost-effective measures to prevent environmental

The Principle is premised on four basic assumptions:

1) There is a threat of harm, either credible or known;
2) The situation presents a lack of scientific certainty or evidence;
3) Cause and effect relationships are not yet proven;
4) There is a necessity or duty to act.[43]

A representative example of the Principle in the context of marine environments is found in the Convention for the Protection of the Marine Environment of the North-East Atlantic[44] (OSPAR Convention):

> [P]reventive measures are to be taken when there are reasonable grounds for concern that substances or energy introduced, directly or indirectly, into the marine environment may bring about hazards to human health, harm living resources and marine ecosystems, damage amenities or interfere with other legitimate uses of the sea, even when there is no conclusive evidence of a causal relationship between the inputs and the effects.[45]

Some versions of the principle incorporated into recent international environmental treaty regimes, soft law instruments, and national legislation also mandate the use of the best available technology or best management practices to prevent harm to the environment,[46] consistent with a shift

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degradation"). "Based on its rapid and widespread acceptance by national actors, the principle may be approaching the status of customary international law." William C. Burns & C. Thomas Duncan Mosedale, *European Implementation of CITES and the Proposal for a Council Regulation (EC) on the Protection of Species of Wild Fauna and Flora,* 9 GEO. INT'L ENVTL. L. REV. 389, 417 n.195 (1997). *But see* Barbara Kwiatkowska, *Southern Bluefin Tuna (New Zealand v. Japan; Australia v. Japan), Order on Provisional Measures (Itlos Cases Nos. 3 and 4),* 94 AM. J. INT'L L. 150, 155 (2000) (quoting Judge Laing in the *Southern Bluefin Tuna Case*: "it is not possible, on the basis of the materials available and arguments presented on this application for provisional measures, to determine whether, as the Applicants contend, customary international law recognizes a precautionary principle;" David Palmeter & Petros C. Mavroidis, *The WTO Legal System: Sources of Law,* 92 AM. J. INT'L L. 398, 407 (1998) (citing the holding of the Appellate Body of the World Trade Organization in *EC -- Measures Concerning Meat and Meat Products (Hormones)* that it remained unclear whether the precautionary principle had ripened into a principle of general or customary international law).

[43] Peter L. deFur & Michelle Kaszuba, *Implementing the Precautionary Principle,* 288 SCI. TOTAL ENV'T 155, 157 (2002).

[44] OSPAR Commission, <http://www.ospar.org/eng/html/welcome.html>.

[45] *Id.* at art. 2(2)(a).

[46] North Atlantic Salmon Commission, *NASCO Plan of Action for the Application of the Precautionary Approach to the Protection and Restoration of Atlantic Salmon Habitat* (2001), at sec. 3, <http://www.nasco.org.uk/html/habitat.html>; Second International Conference on the Protection of the North Sea, Ministerial Declaration (London, Nov. 1987), arts. VII, XV(ii), XVII(1); UNEP governing Council, Second Special Session, Nairobi, Kenya, 1-3 Aug. 1990, Decisions No. SS.II/4, at 41 (endorsing an approach to hazardous waste management that includes consideration of raw material selection, product substitution, and clean production technologies and processes "as a means of implementing a precautionary approach in order to promote production systems which minimize or eliminate the generation of hazardous wastes and optimize use of raw materials, water and energy, for example through recycling"); *See also* John MacDonald, *Appreciating the Precautionary Principle as an Ethical Evolution in Ocean Management,* 26 OCEAN DEV. & INT'L L. 255, 264 (1995):

> Aside from the precautionary principle's theoretical content in international environmental policy, other practical questions still remain where it is applied. In particular, does the principle 'require specific instruments or regulatory approaches'? Many believe that the principle does in fact require specific technologies to control pollution. The notion of requiring the best available technology to be used in emission control has been advanced to serve this

from emphasis on environmental effects to environmental management,[47] or have reversed the traditional burden of proof to establish the safety of practices or activities.[48]

3. The Application of Precaution to Cetacean Issues.

Application of the precautionary principle is particularly salutary in the context of cetacean conservation regimes given the serious deficiencies of knowledge about the impact of exogenous factors on the viability of stocks, such as pollution and fisheries interactions, and the grave threat of population crashes well before downward trends in stocks can be detected.[49] As Burke concludes:

> end. As yet, however, the international community is still divided on the issue. (citations omitted)

See also Carolyn Raffensperger, et al., *. . . and You Can Mean Saying 'Yes' to Innovation,* 401 NATURE 207, 208 (1999):

> Clean production involves the prevention of harm at source through the use of less material-intensive and toxic production systems and products, and was a logical outcome of the principle's demand for preventive action in the face of uncertainty. The question asked is switched from 'how much pollution is acceptable?' to 'how much can we prevent?'

As Gullett points out, some formulations of the principle mandate the more discretionary adoption of the "best available technology not entailing excessive cost" (BATNEEC). Gullett, *supra* note 37, at 58.

[47] David Santillo & Paul Johnston, *Is There a Role for Risk Assessment Within Precautionary Legislation?,* 5(5) HUMAN & ECOLOGICAL RISK ASSESSMENT 923, 925 (1999) ("the precautionary principle also engenders the aspiration to achieve a progressive reduction in environmental burden, without a reliance on the need to identify and quantify specific risks").

[48] BIRNIE & BOYLE, *supra* note, at 118; Owen McIntyre & Thomas Duncan Mosedale, *The Precautionary Principle as a Norm of Customary International Law* (1997), at 19 (unpublished manuscript supplied to the author); Grant J. Hewison, *The Precautionary Approach to Fisheries Management: An Environmental Perspective,* 11 INT'L J. MARINE & COASTAL L. 301, 307 (1996); Jon M. Van Dyke, *Applying the Precautionary Principle to Ocean Shipments of Radioactive Materials,* 27 OCEAN DEV. & INT'L L. 379, 380 (1996); David Favre, *Debate Within the CITES Community: What Direction for the Future?,* 33 NAT. RESOURCES J. 875, 883 (1993); Michael D. Rogers, *Risk Analysis Under Certainty, the Precautionary Principle, and the New EU Chemicals Strategy,* 37 REGULATORY TOXICOLOGY & PHARMACOLOGY 370, 376 (2003) (new EU chemicals strategy contemplates reversing burden of proof for certain substances of "high concern," requiring applicant to demonstrate that proposed use is safe); Government of Canada, *A Canadian Perspective on Precautionary Approach/Principle Discussion Document,* <http://www.ncr.dfo.ca/cppa/HTML/discussion_e.htm>, site visited on Aug. 13, 2002; Convention for the Prevention of Maritime Pollution by Dumping From Ships and Aircraft (Fifteenth Meeting of the Oslo Commission), *On the Reduction and Cessation of Dumping Industrial Wastes as Sea,* Decision 89/1 (14 June 1989) ("dumping of industrial wastes in the North Sea shall cease by 31 December 1989, and in other parts of Convention waters by 31 December 1995 . . . except[ing] those industrial wastes for which it can be shown to the Commission through the Prior Justification Procedure (PJP) both that there are no practical alternatives on land and that the materials cause no harm in the marine environment); Michigan Compiled Law Service, §324.3903 ("The burden of proof is on a manufacturer of a cleaning agent or water conditioner, before distribution for sale or use in this state, to establish that its contents comply with this part and rules promulgated under this part, and will not or is not likely to adversely affect human health or the environment"); *State of the Environment Norway-Waste, Principles of an Environmentally Friendly Policy,* GRID-Arendal (1998) ("In a situation of high potential risk and lack of, or inadequate information, the concept of precaution requires that the onus of scientific proof be on those who intend to draw benefits from the resource and contend that there is no risk; that is, reversal of the burden of proof . . .")

[49] Paul Thompson & Sue Mayer, *Defining Future Research Needs for Cetacean Conservation,* in THE CONSERVATION OF WHALES & DOLPHINS 411 (Mark P. Simmonds & Judith D. Hutchinson, eds. 1996).

> [E]ven where repeated estimates of cetacean population size can be made, the precision of these estimates may be so low that it would take many years to detect population trends. In NE Scotland, where there is an estimated population of only 130 bottlenose dolphins in the Moray Firth, power analysis techniques . . . have shown that it would take over 10 years to

> [W]hales are not fish, and the consequences of delaying regulation because of inadequate data are potentially far more serious and possibly irreversible. In this context, an interpretation and approach based on precautionary principles seem justified. When uncertainly prevails about the status of particular stocks under current or prospective exploitation, early regulatory action might be warranted under the conditions mentioned.[50]

Application of the principle to the conservation of cetaceans in the Mediterranean and Black Sea regions is particularly critical given the very low population levels of many Black and Mediterranean Sea species,[51] serious deficiencies in knowledge about critical biological parameters, including abundance, feeding habits, distribution, social structure and migration patterns,[52] and escalating threats attendant to development in the region.[53]

However, the application of the precautionary principle (or the development of a precautionary approach) to cetacean conservation presents some interesting problems. The problem begins with the definition of the unit to be conserved. Whilst it is widely accepted that the biological population[54] is the unit that should be conserved it is frequently difficult to delineate a cetacean population. (Exceptions occur where animals are geographically isolated or the species is reduced to a small number restricted to one area). Discussions of cetacean conservation have tended to focus on entire species or, alternatively, use a regional context (e.g. the cetaceans of a certain species found within a certain sea area). Consideration should be given to whether such focuses are adequate. For example, if you focus on a region are you trying to conserve a biologically relevant population unit?

> detect an annual population decline of around 5per cent . . . In this case, one clearly cannot wait for significant declines to be detected as the population would have decreased from 130 to 74 individuals before any action was taken. (Citations omitted).

See also, Alexander Gillespie, *Aboriginal Subsistence Whaling: A Critique of the Inter-Relationship Between International Law and the International Whaling Commission*, 12 COLO J. INT'L ENVTL. L. & POL'Y 77, 133 (2001); Jaume Forcada, *Can Population Surveys Show if the Mediterranean Monk Seal Colony at Cap Blanc is Declining in Abundance?,* 37 J. APPLIED ECO. 171, 179 (2000); Sean Hern, *Competing Values: Taking a Broad View on the Narrowing Conservation Regimes of the 1982 United Nations Convention on the Law of the Sea,* 16 AM. U. INT'L L. REV. 177, 193 (2000).

[50] WILLIAM T. BURKE, THE NEW INTERNATIONAL LAW OF FISHERIES 298 (1994).

[51] Joseph F. Dimento, *Black Sea Environmental Management: Prospects for New Paradigms in Transitional Contexts,* in REFLECTIONS ON WATER 245 (Joachim Blatter & Helen Ingram, eds. 2001; M. Fernández-Casado, et al., *Record of Stranded Cetaceans on the Andalusian Coast (Southern Iberian Peninsula), Ceuta and Melilla (Northern Africa) During the Period 1996-1998,* 13 EUR. RES. CETACEANS 201, 202 (1999).

[52] Stephen Roberts, *Examination of the Stomach Contents From a Mediterranean Sperm Whale Found South of Crete, Greece,* 83 J. MARINE BIOLOGY ASS'N U.K. 667, 667 (2003); Alexandre Gannier, Violaine Drouot, & John C. Goold, *Distribution and Relative Abundance of Sperm Whales in the Mediterranean Sea,* 243 MARINE ECO. PROGRESS SERIES 281, 281 (2002); A. Cañadas, et al., *Sperm Whales (Physeter Macrocephalus) at the Gates of the Mediterranean Sea,* 14 EUR. RES. CETACEANS 320, 320-321 (2000); A. Frantzis, et al., *Sperm Whale Presence Off South-West Crete, Greece, Eastern Mediterranean,* 13 EUR. RES. CETACEANS 433 (1999). I. Franco & J. Mas, *Distribution and Evaluation of Cetaceans in the Alboran Sea (S.E. Mediterranean),* 8 EUR. RES. CETACEANS 103, 103 (1994);
Pierre Beaubrun, *Present Knowledge of the Upper Levels of the Marine Trophic Chain in the Mediterranean Sea,* in CIESM, MEDITERRANEAN MARINE BIODIVERSITY 41 (1997); M. Pulcini & D.S. Pace, *Behaviour and Ecology of the Delphinus Delphis Around the Ionian Islands of Greece,* 12 EUR. RES. CETACEANS 170 (1999).

[53] Alexei Birkun, Jr., *Disturbance, Black Sea, in* CETACEANS OF THE MEDITERRANEAN AND BLACK SEAS, a report to the Interim Secretariat of ACCOBAMS (Giuseppe Notarbartolo di Sciara, eds. 2002), at 162; William C.G. Burns, *The Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area*, 1(1) J. INT'L WILDLIFE L. & POL'Y 113-132 (1998); Andrey A. Artov, *The Harbour Porpoise, Phocoena Phocoena Relicta in Waters Off Crimea,* 8 EUR. RES. CETACEANS 122, 122 (1994).

[54] Here we intend biological population to mean a group that consists of individuals that normally interact during their lives and which typically share feeding and breeding grounds. This unit is larger than a family unit but usually smaller than a species or a sub-species. There may be adjacent populations with some exchange between each other but which normally exhibit a degree of isolation – i.e. using different feeding or breeding grounds.

In those rarer instances where a population (or other group) of cetaceans is being closely monitored over time – usually by following individuals using photo-ID-type techniques – demographic parameters can be used to judge the conservation status of the animals[55]. These parameters would include the number of animals in the group over time, reproductive rate (e.g. the number of calves over time), survival rate of individuals and so forth. This kind of demographic data can be used in two ways; firstly, to gauge whether the population is subject to significant pressures that are causing a decline and, secondly to identify what the nature is of any adverse pressures. This second point is clearly the more difficult. For example, a decreasing reproductive rate could be the result of many factors, so once observed might be investigated further via biopsy samples to see if pollution-induced changes are involved[56]. However, conclusively linking-cause to effect is always going to be problematic in cetacean studies. This is because they live in an environment which is difficult for the human species to work in, where "the laws of nature" (for example the transmission of sound) are significantly different to those in better-understood terrestrial environments, and much of what occurs in unseen by man. Moreover, research in this environment can be relatively very expensive. The invocation of the precautionary principle is, therefore, usually highly appropriate in the case of these animals.

Three issues are considered here[57]:

Pollution and Mass Mortalities

Marine mammal populations have been subject to a spate of mass mortality events in recent years.[58] These include several die-off of seals and bottlenose dolphins, off the east coast of the USA in 1987-1988, and in the Gulf of Mexico in 1990-1992, and a striped dolphin die-off in the Mediterranean in 1990-1992. At the time of writing (September, 2002) another major mortality is affecting the harbour seal population of the NE Atlantic. This is the second time in the last two decades that this population has been affected by such an event. The previous European seal die-off occurred in 1988.

Epizootics are complex events wherein many factors conspire to mediate how the passage of a virus through a population affects individuals and the population itself. Factors influencing mortality could include age, sex, degree of exposure, intercurrent disease, and individual differences in susceptibility.

In the case of the ongoing seal epizootic, the proximate cause is Phocine Distemper Virus (PDV - and reported to be very similar to the virus that devastated the same populations in 1998.) PDV infection in harbour seals leads in the majority of cases to death but this is not the case for grey seals. So it may be inferred that there is some innate factor that causes a difference of outcomes between the expression of the PDV-generated disease between the two species.

There has been some debate about the role of chemical pollution in the marine mammal die-offs and this has fed into discussions about how to deal with discharges of pollution into the marine environment.

Organochlorines (and similar substances) that are known to cause immunosuppression can reasonably be assumed to exacerbate disease events. However, given the other complicating factors, it

[55] The IWC has been developing an approach that uses cetacean population demographics as a primary tool in evaluating cetacean habitats – see Workshop document submitted to ACCOBAMS.

[56] The IWC has initiated a comprehensive programme of work to investigate the significance of chemical pollutants for marine mammals. The main aim of this work is to generate a suite of "biomarkers" that would indicate where pollution is causing significant impacts. However, this work is presently to some extent stalled due to a lack of funding. See reports of last three IWC Scientific Committees.

[57] A few years ago, Mayer and Simmonds, considered three issues, using certain case studies, to examine the difficult relationship between scientific knowledge and policy development. Here, we re-iterate their main points and add further comments. Sue Mayer and Mark Simmonds, *Science and Precaution in Cetacean Conservation,* in THE CONSERVATION OF WHALES & DOLPHINS 391 (Mark P. Simmonds & Judith D. Hutchinson, eds. 1996).

[58] See for example: Simmonds, M.P. and Mayer S.J. 1997. An evaluation of environmental and other factors in some recent marine mammal mortalities in Europe: implications for conservation and management. ENVIRON. REV. 5: 89,98.

is perhaps surprising that a clear association could even be suggested between a disease outbreak and a contaminant burden. Nonetheless (and noting that a full review of this topic is outside of the scope of this paper), evidence has continued to accrue that suggests pollution is a significant co-factor in the severity of the mortality events.

Given that the fatty tissues of marine mammals contain levels of lipophilic pollutants far above background levels, the relevant policy question should be "what [if any] level is safe". The answer should relate to both the levels recorded in the animals themselves and those in the wider environment. It is doubtful that any degree of pollution-induced "immunosupression" would be deemed acceptable in wild mammals.

The ongoing comprehensive IWC pollution study (Pollution 2000+)[59] is not yet able to provide guidance and, meanwhile, it has been suggested that even very low body burdens of xenobiotics may have significant consequences. There is also the significance of new xenobiotics entering the marine environment and whilst the environmental levels of some of the better-known pollutants (such as PCBs and DDT) may be declining in some areas, these other substances may be just as potent and appear to be on the increase[60].

So would a reasonable extrapolation of the precautionary principle in the case of chemical pollution be that all discharges of xenobiotics should be avoided? This would certainly seem to be consistent with the scientific evidence to date.

As noted earlier, an alternative approach to the precautionary principle is the principle of "assimilative capacity."[61] Assimilative Capacity is based on the notion that we can scientifically determine safe levels of pollutant discharges. If this impression is perpetuated it may damage cetacean conservation (and other conservation initiatives) by:

i. delaying any action in favour of maintaining the status quo; and
ii. ultimately discrediting the underpinning science when its perceived capabilities are found to be false.

So, policy makers have to decide if they should take measures to significantly curtail discharges, which may adversely affect and irritate industry (perhaps even causing the problem to move elsewhere) or wait for more evidence and risk serious impacts in the marine environment. In essence, this requires a judgement on how the environment should be valued relative to economic considerations.

Marine Noise Pollution

The emerging issue of marine noise pollution is a very similar issue to marine chemical pollution. In the case of the Heard Island Experiment, an issue that first brought the threat posed by loud point noise sources to marine mammals into the spot-light and highlighted the ignorance that existed about the effects of noise. This was well illustrated when the experiment produced at least one totally unpredicted result, as, during transmission, sperm and pilot whales fell silent. (This also cast doubt on the assumed insensitivity of odontocetes to low frequency noise.)

Subsequently a slew of other noise issues have come to light. These include the loud noises produced in the prospecting conducted by the fossil fuel industry, the noise from large vessels, noise from whale watching boats (which by necessity come into close contact with cetaceans) and, most recently, the use by the military of loud low frequency and other powerful sonars.[62]

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[59] See 25

[60] See for example the short review: Simmonds, M.P., Johnston, P.A. and G.M. Troisi. 2002. A note concerning "novel pollutants" and cetaceans. J. cetacean Res. Manage. 4(suppl.)

[61] *See supra* note 34 and accompanying text.

[62] *See* Mark Simmonds & Laetitia Nunny, *Habitat Loss and Degradation, Mediterranean Sea,* in Notarbartolo di Sciara, *supra* note 53, at 39; Donald A. Croll, et al., *Only Male Fin Whales Sing Loud Songs,* 417 NATURE 809, 809 (2002); A. Pérez, et al., *The Effects of Acoustic Pollution on the Cetaceans of the Alboran Sea (Spain),* 14

The emerging awareness of marine noise pollution (and disturbance of cetaceans) as a significant issue is illustrated by the text of the ACCOBAMS agreement itself[63].

It has been suggested[64] that

- the application of the precautionary principle in the case of marine noise would lead to the consideration of other options and would have taken account of scientific uncertainty and,
- for the Heard Island experiment, full justification of the experiment should also have taken place.

Justification would include evaluation of the "need" to conduct this particular research, its likely benefit, and consideration of alternative approaches. These elements might generally be proposed as fundamental parts of the precautionary principle.

It would be interesting to see how this approach would fare if used to evaluate seismic exploration or military sonars. One particular problem in the latter case may be that because of the sensitivity of the topic an independent assessment of benefits may not be possible.

Fisheries bycatch

Arguably the greatest of the threats facing many species of cetaceans is their accidental capture in fishing nets: also known as "bycatch."[65] The example of harbour porpoise bycatch in the North Atlantic has been considered previously.[66] Evidence available a few years ago indicated that porpoise populations were in decline but it was noted that the "softness" of the science concerned had undermined calls for action and instead demands for more data prevailed.

Several years later, the data for at least one harbour porpoise population have become significantly stronger. A population estimate and a removal rate have been calculated for the porpoises

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EUR. RES. CETACEANS 191 (2000); Colin D. MacLeod, *A Review of Beaked Whale Acoustics, With Inferences on Potential Interactions with Military Activities,* 13 EUR. RES. CETACEANS 35, 35 (1999).

[63] ACCOBAMS recognises "disturbance" in one preambular paragraph and Article II 4 requires that in implementing the prescribed conservation measures the Parties shall apply the "precautionary principle."

The "Conservation research and management measures" for ACCOBAMS are again spelled out in an annex (Annex 2), where Point 1c requires that Parties shall

> require impact assessments to be carried out in order to provide a basis for either allowing or prohibiting the continuation and the future development of activities that may affect cetaceans or their habitat……including…..offshore exploration and exploitation, nautical sports, tourism and cetacean watching, as well as establishing the conditions under which such activities may be conducted.

In the original text of the Act "take" is defined (Article 13) as "to harass, hunt, capture or kill, or attempt to harass, hunt, capture or kill any marine mammals."

More latterly, the ASCOBANS parties have recognised again the threat of disturbance and noise by, for example, passing a resolution on this issue (Resolution No.4) at the last meeting of Parties in 2000 (ASCOBANS, 2002).

[64] Simmonds and Mayer (1996) *supra note* 30.

[65] Andrew J. Read , Phebe Drinker, Simon Northridge, *By-Catches of Marine Mammals in U.S. Fisheries and a First Attempt to Estimate the Magnitude of Global marine Mammal By-Catch,* 55th Meeting of the International Whaling Commission, SC/55/BC5 (2003), at 4 (projecting that more than 300,000 cetaceans are killed annually globally as bycatch in fisheries).

[66] Simmonds and Mayer (1996) *supra note* 30.

of the Celtic Sea. Set bottom gill nets have been causing a removal of some 6% of the population per annum.[67] This has been known about for several years but no mitigation response has been made.

In this case, the interests of fisheries economics seem to outweigh nature conservation concerns.

The international ban of highseas driftnets,[68] which has been followed more recently by an EU-wide ban on all driftnets,[69] might be seen as a precautionary response to an environmentally devastating form of fishing (although it might be argued that the evidence is so compelling that to say the action was precautionary is underplaying it). However, there are signs that the driftnet ban has not been properly thought through and managed. There are reports, for example, of unwanted driftnets just being sold from one side (the EU side) of the Atlantic to the other. Elsewhere in the EU, fishermen have initiated another large scale and dolphin-deadly, fishing method – the use of giant pair-trawls – perhaps partly in response to the loss of their ability to continue to use drift nets. Precautionary mitigation measures thus need to be managed across the whole industry.

Lessons from fisheries management

Fisheries managers have long had to deal with uncertainties. MacGarvin[70] has recently considered the application of precaution to fisheries, and whilst the significant differences between the biology of the fin fish that the industry usually target and cetaceans should be borne in mind[71], his analyses may be helpful. The history of fisheries management is littered with concerns and fish stock crashes. These matters came to light quite soon after the rapid expansion of fisheries in the 19th century. For example, there was a series of official British enquiries between 1866 and 1893 about the sustainability of the valuable herring fishery. Natural fluctuations in herring stocks for a while served to hide the fact that human actions could exacerbate declines. Indeed at one time it was thought that "marine fisheries are inexhaustible"[72].

MacGarvin identified the phenomenon of "fishing down the food chain" – where, for example, high-value herring catches became increasingly uneconomic. The next focus was demersal fish but then they too gave way to "industrial catches" including sand eels. MacGarvin commented that "one can surmise that the vast removal of biomass by the fisheries will also have had an impact on other species, but comprehensive data are scarce".

He also suggests that "fisheries provide a rich seam of lessons regarding the precautionary approach, of wider interest than to fisheries alone". These lessons are summarised here in Table One and many, in the authors' opinion, can be read across to cetacean issues.

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[67] Alison Ross, Helen McLachlan, Mark Simmonds. *The Fishing Industry and Cetacean Bycatch – Time for Action.* COASTAL FUTURES 2001: COASTAL MANAGEMENT FOR SUSTAINABILITY –REVIEW AND FUTURE TRENDS 8, 101.

[68] United Nations General Assembly, *Resolution on Large-Scale Pelagic Driftnet Fishing and Its Impact on Living Marine Resources of the World's Oceans and Seas*, 44/225, adopted Dec. 22, 1989, 29 I.L.M. 1555 (1990).

[69] *Council Regulation (EC) No 1239/98 of 8 June 1998 amending Regulation (EC) No 894/97 laying down certain technical measures for the conservation of fishery resources*,
Official J.L. 171 , 17/06/1998 p. 0001 – 0004, art. 11(a)(1).

[70] M. MacGarvin. 2002. *Fisheries: Taking stock,* 10. Chapter 2 in The Precautionary Principle in the 20th Century Late Lessons from Early Warnings Editors : Poul Harremoës, David Gee, Malcolm MacGarvin, Andy Stirling, Jane Keys, Brian Wynne, Sofia Guedes Vaz (Eds).
MacGarvin suggests that it was in the early 1990s when precaution became more explicit, principally via the negotiation of two documents: the "Code of conduct for Responsible Fisheries" published by FAO and the "UN Agreement on Straddling Stocks".

[71] In a nutshell, targetted fish are usually (but not always) short lived and fast and copious breeders but cetaceans are the reverse, long-lived and slow breeding (i.e. "r-selected" versus "k-selected").

[72] A quote from Thomas Huxley, President of the Royal Society and Inspector of Fisheries from MacGarvin (2002).

Perhaps the principal similarity between fisheries management issues and cetacean conservation relates to attempts to define "acceptable" levels of removals or "takes", whether they are directed (i.e. intentional), incidental or accidental. Such discussions normally relate to whether removals are sustainable.[73] This, in turn, relates to population sizes, ranges and demographics (particularly reproductive parameters) and requires a good knowledge of the population concerned. These discussions are typically based on modelling of outcomes of various removal and population scenarios.

It is tempting to apply similar approaches to cetacean issues. Certainly the PBR (Potential Biological Removals) approach used in the US, the Revised Management Procedure (RMP) of the International Whaling Commission and the bycatch limits identified by ASCOBANS[74] all do this. However, before moving to such an approach in the ACCOBAMS region it may be wise to consider the quality of data relating to the populations concerned and whether setting limits will practically aid conservation or not.

[73] Modern fisheries have for sometime used an approach based on the theory of "Maximum Sustainable Yield" (MSY) – an approach further lauded by the recent UNCED meeting. However, the UN Straddling Stocks agreement says that "the fishing mortality rate that generates maximum sustainable yield (MSY) should be regarded as a minimum standard for limit reference points…" This is because MSY is known to overestimate sustainable yields.

[74] N.B. The ASCOBANS limits were identified in a resolution that also stressed the need to aim for zero removals.

Table 1. Lessons from fisheries.	Comments
1. The distinction between the precautionary principle and precautionary approaches.	The "approach" refers to a practical application of the principle and practical application will vary from topic to topic.
2. The significance of "appropriate levels" of proof.	The debate in fisheries matters (as in other environmental issues) about when to take action frequently cycles around what constitutes adequate proof or appropriate levels of proof.
3. Distinguishing between uncertainty and ignorance.	
4. Unrealistic expectations (or incredible claims) as to the soundness of scientific conclusions.	Mayer and Simmonds (1996) also drew attention to inappropriate scientific claims blocking more precautionary actions.
5. The importance of drawing on historical and lay knowledge.	This might also be useful for cetaceans, for example where history knowledge reveals original distributions and/or movements.
6. The success of no-take zones.	
7. Not "brushing blind spots" under the carpet.	In other words acknowledging what you we not know.
8. Avoiding the dominance of any one discipline.	MacGarvin identifies the general dominance of stock modellers. He also recommended "avoiding reliance on ever more elaborate models to explain away predictive failures."
9. Accounting for real world conditions	Meaning problems relating to underestimation of real fishing mortalities and technologies
10. Taking full account of the pros and cons of any one approach	e.g. Stock assessment versus wider approaches.
11. Taking account of wider social perspectives	Acknowledging the importance of value judgements and evaluating all options.
12. Dealing with institutional obstacles and regulatory independence and "maintaining due humility".	Here MacGarvin identifies reluctance to address fundamental economic issues, blurred independence of advisers and policy makers.

4. Application of the Precautionary Principle in the context of ACCOBAMS.

Unfortunately, most incarnations of the precautionary principle in international environmental treaty regimes to date, "provide few, if any operable guidelines for policy makers nor . . . constitute a rigorous analytical schema."[75] As one commentator has observed, "[the principle] seem[s] more like a

[75] Timothy O'Riordan & Andrew Jordan, *The Precautionary Principle in Contemporary Environmental Politics,* 4 ENVTL. VALUES 191, 192 (1995). *See also* Konrad von Moltke, *Whither MEAs: The Role of International Environmental Management in the Trade and Environment Agenda,* International Institute for Sustainable Development (2001), at 39; Kenneth R. Foster et al., *Policy Forum: Risk Management - Science and the Precautionary Principle*, 288 SCI. 979 (2000); Jenifer Ross, *Legally Binding Informed Consent,* 10 COLO. J.

"sound bite" rather than a principle rooted in the law."[76] As a consequence, policy makers are often confused about their obligations in applying the principle, or blithely sign agreements that incorporate the principle knowing that it's likely to be unenforceable given its vagueness.[77] Thus, it should come as little surprise that the principle has seen extremely limited implementation by States at the national level or in international regimes.[78]

ACCOBAMS incorporates an especially vague version of the precautionary principle, simply providing that "the Parties shall apply the precautionary principle" in the context of conservation, research and management measures.[79] In this amorphous form, without further elaboration, it is likely that the principle would hold little or no sway in the implementation of the Convention.

To ensure effective operationalisation of the treaty's precautionary principle provision, the Parties should establish a working group to answer two scientific questions that constitute a *sine qua non* for the establishment of specific guidelines for implementing the principle:

1) Exactly what (if not scientifically proven facts) must be known before measures shall be taken and with what degree of certainty?;
2) In what manner should regulators respond to uncertain risks?[80]

The working group should also be tasked with establishing guidelines for applying the principle as a component of management procedures germane to cetacean protection. The European Commission has recently set forth guidelines in a Communication that may provide a useful starting point for this exercise.[81]

Moreover, to ensure meaningful implementation and clear guidance to policymakers, the precautionary principle provision of ACCOBAMS should also be amended to include specific precautionary mandates, such as:

1) Mandating the best available technology to minimise threats to cetaceans, including technology to reduce bycatch in fisheries operations and pollution from land and marine-based sources;[82]

INT'L ENVTL. L. & POL'Y 499, 525 (1999); S.M. Garcia, *The Precautionary Principle: Its Implications in Capture Fisheries Management,* 22 OCEAN & COASTAL MGMT. 99, 111 (1994).

76 Deborah Katz, *The Mismatch Between the Biosafety Protocol and the Precautionary Principle,* 13 GEO. INT'L ENVTL. L. REV. 949, 949 (2001). *See also* David Venderzwaag, *The Precautionary Principle and Marine Environmental Protection: Slippery Shores, Rough Seas, and Rising Normative Tides,* 33 OCEAN DEV. & INT'L L. 165, 166 (2002):

> However, getting a clear "normative fix" on the precautionary principle is difficult. The principle is often called "elusive" given its general nature and still limited international implementation. The law and literature relating to the precautionary principle has been described as in "disarray," with great confusion over meaning and detachments from relevant social science and legal literature [citations omitted].

77 Arvidsson, *supra* note 33, at 15; James E. Hickey & Vern R. Walker, *Refining the Precautionary Principle in International Environmental Law,* 14 VA. J. INT'L L. 423, 424 & 437 (1995).

78 David Venderzwaag, *The Precautionary Principle and Marine Environmental Protection: Slippery Shores, Rough Seas, and Rising Normative Tides,* 33 OCEAN DEV. & INT'L L. 165, 176 (2002).

79 Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area, 36 I.L.M. 777 (1997), at art. II(4) (ACCOBAMS).

80 Jan Bohanes, *Risk Regulation in WTO Law: A Procedure-Based Approach to the Precautionary Principle*, 40 COLUM. J. TRANSNAT'L L. 323, 332 (2002).

81 Commission of the European Communities, *Communication from the Commission on the Precautionary Principle,* COM(2000) 1 (2000).

82 *See,* for example, Swedish Environmental Code, Ch. 2, Sec. 3:

2) In the context of the required impact assessments for activities that may have an adverse impact on cetacean stocks,[83] imposition of the burden of proof on the parties conducting the activities to demonstrate their safety. In all cases a reasonable range of alternatives should be considered, including a non-action alternative for new activities when there is evidence of potential harm to cetaceans from the activity;
3) Establishment of an independent observer scheme to more closely monitor cetacean bycatch, as well as enhance our underlying knowledge of cetacean stocks in the region;
4) Establishment of precautionary reference points for individual cetacean stocks in the Agreement Area, which if reached will trigger a series of measures to stabilise populations.[84] Given the paucity of data on most cetacean populations in the region, there is a very real possibility that research in the future will uncover "adverse surprises," that is, lower, perhaps radically lower, than anticipated stock levels for some species in the Agreement area. Thus, it is critical that the principle of "precautionary robustness," that is, "readiness for quick action in response to adverse surprise,"[85] be incorporated into any scheme to use precautionary reference points. This will necessitate the establishment of measures that can be implemented quickly and without the need for further deliberation to bolster and stabilize flagging populations;
5) Establishment of more precautionary protocols for risk analysis assessments germane to activities or substances that may threaten cetaceans, as well as in population surveys. Effective operationalisation of the precautionary principle requires the calculation of the probability of Type II errors (acceptance of false negative results) in the conducting of such assessments.[86] In the context of environmental risks, Type II errors are more dangerous than Type I errors (acceptance of false positive results)[87] because they can result in irreversible damage, such as species extinction.[88] Currently, 98% of all marine and aquatic biomonitoring and high tier

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> Persons who pursue an activity or take a measure, or intend to do so, shall implement protective measures, comply with restrictions and take any other precautions that are necessary in order to prevent, hinder or combat damage or detriment to human health or the environment as a result of the activity or measure. For the same reason, the best possible technology shall be used in connection with professional activities.

[83] ACCOBAMS, *supra* note 79, at Annex 2(1)(c).

[84] A "reference point" is "a conventional value, derived from technical analysis, which represents a state of the fishery or population, and whose characteristics are believed to be useful for the management of the unit stock." J.F. CADDY & R. MAHON, REFERENCE POINTS FOR FISHERY MANAGEMENT (1995), at sec. 2.1, <http://www.fao.org/DOCREP/003/V8400E/V8400E00.HTM#toc>. "Target reference points" are indicators of stock status that establish desirable targets for management. *Id.* "Limit reference points" refer to pre-established "red areas" or thresholds levels for spawning biomass in a fishery where "the continuity of resource production is in danger, and immediate action is needed. *Id.* at sec. 2.3.

[85] Peter Read, *Precautionary Climate Policy and the Somewhat Flawed Protocol: Linking Sinks to Biofuel and the CDM to the Convention,* 2 CLIMATE POL'Y 89, 92 (2002).

[86] Paul Boudreaux, *Book Review: Environmental Costs, Benefits, and Values: A Review of Daniel A. Farber's Eco-Pragmatism,* 13 TUL. ENVTL. L.J. 125, 160, n. 230 (1999); Richard A. Posner, *An Economic Approach to the Law of Evidence*, 51 STAN. L. REV. 1477, 1504 (1999).

[87] Buhl-Mortensen provides an example of Type I statistical errors in the context of the potential impacts of pollutants on marine organisms:

> A monitoring programme usually tests a null hypothesi (*Ho*); that a discharge has no effect on nature … Results from some statistical tests will lead either to rejection of *Ho*or not. If it *is* rejected and we concluded that there is an effect, even when *no* effect of the discharging exists … then we commit a type-I error. Scientists traditionally try to reduce the frequency of type-I error to 5 in 100 … Lene Buhl-Mortensen, *Type II Statistical Errors in Environmental Science and the Precautionary Principle,* 32(7) MARINE POLLUTION BULL. 528, 529 (1996).

[88] Reed F. Noss, *Symposium on Ecology and the Law: Some Principles of Conservation Biology, As They Apply to Environmental Law,* 69 CHI.-KENT L. REV. 893, 896 (1994); Barbara L. Taylor & Tim Gerrodette, *The Use of Statistical Power in Conservation Biology: The Vaquita and Northern Spotted Owl,* 7(3) CONSERVATION BIOLOGY 489, 490 (1993).

aquatic ecotoxicology regimes, for example, only calculate the probability of committing a Type I error.[89] More generally, most assessments, including those conducted by ecologists, are singularly focused on reducing Type I errors, that is, minimizing false positives.[90] The use of the statistical tool known as power analysis can substantially help to reduce the risk of committing Type II errors:

> In a statistical power analysis, the focus is on the flip side of the coin of the null hypothesis – namely the risk of committing a Type II error . . . Power analysis (1-β) shows us the probability that our t-test could have shown a difference in case there was one in reality. Where α in the t-test symbolizes the acceptable risk of committing a Type I error, β symbolizes the risk of committing a Type II error. For any given test, we would like to have the quality 1-β be as large as possible and the quantity of β as small as possible The power (1-β) of an investigation is related to and influenced by four variables; effect size (Δ), sample size (n), sample variability (σ^2) and α in the following way:
>
> a) If Δ increases (↑) then (↔) β↓↔ power ↑
> b) If *n* ↑↔βpower↑
> c) If σ^2↓↔β↓↔power↑
> d) If α↑↔β↓↔power↑

If *n* or Δ is too low or σ^2 is too high, the statistical power of the test is reduced and thus the risk of committing a Type II error is increased. If a study fails to reject the null hypothesis with low power, the study should be revised instead of concluding that there is no effect.[91] This may necessitate changes to research methodologies, including increasing sample sizes, reducing sample variability, or increasing the length of studies.[92] In the context of assessing the possible impacts of substances on cetaceans, risk assessment procedures also need to take into account critical factors that increase the uncertainty of likely outcomes, including estimates of exposure probability, the parameters and form of dose-response relationships and parameters, and forms of population models.[93] In cases where high levels of uncertainty or intrinsic indeterminacies preclude meaningful risk assessment,[94] safety factors should be incorporated into the decision making process, such as the use of pessimistic assumptions,[95]

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[89] Hans Sanderson & Søren Petersen, *Power Analysis as a Reflexive Scientific Tool for Interpretation and Implementation of the Precautionary Principle in the European Union,* 9(4) ENVTL. SCI. & POLLUTION RES. 1, 3 (2001).

[90] Lene Buhl-Mortensen & Reidar Toresen, *Fisheries Management in a Sea of Uncertainty: The Role and Responsibility of Scientists in Attaining a Precautionary Approach,* 4(3) INT'L J. SUSTAINABLE DEVELOPMENT 245, 257 (2001); Anne Fairbroterh & Richard S. Bennett, *Ecological Risk Assessment and the Precautionary Principle,* 5(5) HUMAN & ECOLOGICAL RISK ASSESSMENT 943, 946 (1999); Randall M. Peterman, *The Importance of Reporting Statistical Power: The Forest Decline and Acidic Deposition Example,* 71(5) ECOLOGY 2024, 2025 (1990).

[91] Sanderson & Petersen, *supra* note 89, at 3.

[92] *Id.;* Taylor & Gerrodette, *supra* note 88, at 490.

[93] John Harwood, *Risk Assessment and Decision Analysis in Conservation,* 95 BIO. CONSERVATION 219, 220 (2000); D. Santillo, et al., *The Precautionary Principle: Protecting Again Failures of Scientific Method and Risk Assessment,* 36(12) MARINE POLLUTION BULL. 939, 942 (1998).

[94] Indeterminacies arise as a consequence of critical factors in the assessment process that are both unknown and incapable of being subjected to analytical reduction, such as the mechanism of action or causal chains. Santillo, et al., *supra* note 93, at 947. *See also* Aniello Amendola, *Recent Paradigms for Risk Informed Decision Making,* 40 SAFETY SCI. 17, 19-20 (2001).

[95] Santillo, et al., *supra* note 93, at 947; J.S. Gray & J.M. Bewers, *Towards a Scientific Definition of the Precautionary Principle,* 32(11) MARINE POLLUTION BULL. 768-771 (1996).

the use of Bayesian statistical techniques,[96] such as Monte Carlo uncertainty analysis,[97] or reversal of the burden of proof in conducting power analysis.[98]

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[96] The application of Bayesian statistical techniques facilitates quantification of the uncertainty in parameter estimates to determine the probability that a scientific hypothesis is true given a set of data. Araron M. Ellison, *An Introduction to Bayesian Inference for Ecological Research and Environmental Decision-Making,* 6(4) ECOLOGICAL APPLICATIONS 10361039 (1996). "In technical terms, Bayes' Theorem states that the subjective posterior odds (odds after being exposed to new data) . . . that a hypothesis is true can be determined by multiplying the prior odds (or odds before exposure to the new data) . . . by the ratio of (1) the probability that the data would have been observed if the hypothesis were true to (2) the probability that the data would have been observed if the hypothesis were not true. The ratio of (1) to (2) above is referred to as the likelihood ratio." Stephen Charest, *Bayesian Approaches to the Precautionary Principle,* 12 DUKE ENVTL. L. & POL'Y F. 265, 272 (2002).

[97] Harwood, *supra* note 93, at 224; H. Caswell, et al., *Harbor Porpoise and Fisheries: An Uncertainty Analysis of Incidental Mortality,* 8 ECOLOGICAL APPLICATIONS 1226-1238 (1998). "Monte Carlo simulation is a statistical technique by which a quantity is calculated repeatedly, using randomly selected "what-if" scenarios for each calculation. Though the simulation process is internally complex, commercial computer software performs the calculations as a single operation, presenting results in simple graphs and tables. These results approximate the full range of possible outcomes, and the likelihood of each. When Monte Carlo simulation is applied to risk assessment, risk appears as a frequency distribution graph similar to the familiar bell-shaped curve, which non-statisticians can understand intuitively." U.S. Environmental Protection Agency, *Use of Monte Carlo Simulation in Risk Assessments,* <http://www.epa.gov/reg3hwmd/risk/guide1.htm>, site visited on Jan. 10, 2003; *see also* Paolo F. Ricci, et al., *Precaution, Uncertainty and Causation in Environmental Decisions,* 29 ENV'T INT'L 1, 7 (2003).

[98] *See* note 48 and accompanying text. For example, under some circumstances policy makers might require parties affecting populations to demonstrate with high power that these activities will not adversely affect populations rather than requiring scientists to demonstrate that a population is declining before such activities can regulations. Taylor & Gerrodette, *supra* note 88, at 497; Peterman, *supra* note 90, at 2026.

ANNEX XXVIII

SHIP COLLISIONS

Addressing the Issue of Cetacean Mortality Deriving from Collisions with Vessels in the ACCOBAMS Area[99]

Draft Concept Paper

Prepared for SC2 by
Giuseppe Notarbartolo di Sciara and Simone Panigada

Article 2 of the Conservation Plan (Annex 2) of ACCOBAMS states:

> "*Parties shall, in co-operation with relevant international organizations, collect and analyse data on direct and indirect interactions between humans and cetaceans in relation to inter alia fishing, industrial and tourist activities, and land-based and maritime pollution.*
>
> *When necessary, Parties shall take appropriate remedial measures and shall develop guidelines and/or codes of conduct to regulate or manage such activities*."

Vessel traffic is most intense in the Agreement area, as a reflection of the large volume of its coastal and marine economic activities and the high levels of its human coastal populations. It is obviously unlikely that significant traffic reduction will occur specifically to decrease danger to cetaceans and other marine life. However, precautionary and mitigating measures can be envisaged to reduce such danger. These include:

Monitoring, research and risk assessment. Accurate data on the seasonal and geographic distribution of traffic, and its volumes, routes, typologies, and possible evolution trends in the Agreement area are, to the best of our knowledge, unavailable at the moment in an organised, usable format. Such information, coupled with information on cetacean survival rates, distribution, habitat use and habitat charcaterisation, would allow a first evaluation of a cause-effect relationship between marine traffic and cetaceans in terms of intensity of exposure. Furthermore, research on the possible long-term effects of traffic disturbance on cetacean populations survival, through behavioural and physiological change, loss of energy intake, and area displacement, should be undertaken to elucidate this still quite poorly understood aspect.

Where impacts from traffic are known or suspected, **recommendations** (and possibly, in critical habitat, **regulations**) can be envisaged and provided to shipping operators in terms of minimum approach distances, speed limits when near cetaceans, and the following of pre-determined routes. Areas containing known cetacean critical habitats may be subjected to limited access. Recommendation and regulation should be accompanied by appropriate awareness and education campaigns, to inform user groups of the potential impact of traffic on cetaceans and to provide codes of conduct to minimise disturbance.

Collisions between vessels and cetaceans are an extreme consequence of the effects of vessel traffic on cetaceans, and very often result in physical damage to both the cetacean and the vessel involved, and thus a source of cetacean mortality. Given the perceived increasing importance that this threat is acquiring in the Agreement area, the theme of collisions should receive special attention. The case of the North Atlantic right whale provides a relevant illustration on how the problem of collisions between vessels and individuals from the world's most endangered whale species has been addressed elsewhere (Marine Mammal Commission 1999). Off the east coast of the U.S. the movements of

[99] The text of this document is n large part derived from: Notarbartolo di Sciara G., Birkun A., Jr. 2002. Conservation needs and strategies. In: G. Notarbartolo di Sciara (Ed.), Cetaceans of the Mediterranean and Black Seas: state of knowledge and conservation strategies. A report to the ACCOBAMS Secretariat, Monaco, February 2002. Section 18, 21 p.

individual whales are being monitored and communicated to ships in their vicinity; underwater listening stations have been set up to identify areas of concentration; the species' distribution has been correlated with oceanographic features to produce GIS-based distributional predictive models; and, finally, a variety of active acoustic devices to detect animals in front of the ships are being developed and tested.

All the measures listed above, aimed at mitigating the negative effects of vessel traffic on cetaceans, will also contribute to address the collision issue. Of particular importance are actions involving the collection of detailed and complete information on collision events and on their modalities and dynamics, and accurate awareness and involvement activities targeting ship captains and crew.

In addition, the following actions can also be envisaged where collision problems are known to be substantive:

1. Solutions aimed at a general decrease of risk in special areas. Zones containing critical habitat of cetaceans susceptible to be impacted by colliding vessels should be identified (also on the basis of mathematical models designed to predict whales' presence and risk levels) and delimited, and speed and/or tracks or corridors could be prescribed to transiting vessels within those limits, in the hypothesis (to be tested) that whales may become used to localised presence of traffic and pay more attention in the appropriate locations.

2. Solutions aimed at increasing the potential by the vessels of detecting and avoiding the whales. These include the creation of an information network among vessels to inform operators about the position of whale concentrations, based on sighting data, passive acoustic data, and distribution prediction models provided by research teams; the establishment of permanent watches on the bridge during daylight, and the use of I.R. technology to enhance visual detection during the night and rough weather; the development of active acoustic devices (e.g., sub-surface sonar) enabling the detection of whales in vicinity of the track line, at a useful distance. Many problems, however, exist in this respect (e.g., the tendency of sound to bend downwards in thermally stratified waters, thus reducing detection range to unworkable conditions; the small acoustic reflectivity of a whale body; concern about further ensonification of the whales' environment).

3. Solutions aimed at increasing the potential by the whales of detecting and avoiding vessels. This seems a most promising approach, since whales are certainly the most interested parties in avoiding a collision, and appear to excel in the art of naturally avoiding contact with vessels whenever they are aware of their presence. A better understanding of the vessel detection capabilities by the whales and of the exact reasons for their failure to do so effectively, ultimately leading to a collision, is a fundamental step in this direction. The problem very likely resides in the characteristics of the sound produced by the vessel and perceived underwater by the whales, which may be inadequate to convey the necessary information on distance, bearing, and speed of approach of the vessel itself. Once such knowledge is gained, conceivably the sound produced by the vessel could be modified or enhanced to provide more meaningful spatial information to the whales, improve their detection capabilities and allow their safe manoeuvring and avoidance.

In conclusion, it can be suggested that the following priority actions be undertaken to address the issue of collisions in the ACCOBAMS area:

1. Where collisions are known to occur, steps should be taken to enable **assessment of the impact** of collisions on the populations involved. The aim in this case would be to assess collision-derived mortality and relate it to population size and to the other sources of mortality for that population. Possible actions:
    - Improve reporting from maritime companies, through top-down (i.e., regulatory) and bottom-up (i.e., awareness, involvement) approaches;
    - Enhance reporting on cetacean casualties from vessel collisions through the stranding network;

- Enhance reporting on cetaceans surviving collision events through photo-identification programmes;
- Characterise preferred habitats for each potentially affected species;
- Assess the size and survival rate of the cetacean population involved.

2. Species that are believed to be most affected by collision events (e.g., fin and sperm whales) could be subjected to CEE[100] to investigate their reactions to approaching vessels and to understand the reasons for shortcomings in successfully detecting the approaching vessel's location and trajectory, and engaging in effective evasive manoeuvring. A greater understanding of the perceptive mechanisms involved may enable development of effective warning devices to envelop ships with, and may be so efficient as to cause the ambitious achievements described in the above paragraph (1) to become superfluous.

[100] Controlled Exposure Experiments.

ANNEX XXIX

ECO-LABELLING

Eco-labelling

The Parties to ACCOBAMS, at their first session (Monaco 2002), gave to the Scientific Committee, the mandate to work on ecolabelling and to prepare, for adoption, a list of uses and activities which may become ecolabellized in the future.

The Committee, at its first meeting (Tunis, 2002), took the decision to go in further details on this subject and not only to make a list. He asked the ACCOBAMS secretariat, to get an external support for developing this expertise and so, to make him able to give relevant technical preconisations on ecolabelling, to the Parties, at their next meeting, in November 2004.

Considering that ACCOBAMS and the PELAGOS sanctuary have a common interest on this topic, the Government of Monaco gave a financial support to perform this work and contracted an expert to do it.

The survey which started mid-November, aims to identify priorities for action to be developed by the Parties to ACCOBAMS and to the PELAGOS sanctuary, relating to low cost uses and activities in their respective concerns and areas, considering the status of the cetaceans.

The purpose of this survey is:

- to facilitate the work of the two agreements, in promoting wise uses of marine resources, not only cetaceans, and sustainable commercial operations (ecotourism, fisheries, shipment, marine therapies, etc), in regard to the conservation of cetaceans ;
- to suggest and preconize fields for action to the parties, to pursue this objective through binding and non binding tools, especially the labellisation and/or the certification of products and activities drawn from the sea.

The survey will, first of all, overview the main overall treaties and european regulations **(Part. 1),** dealing with trade and conservation of marine biodiversity in this region. It will be evaluated if and how those legal instruments can be used for encouraging an ecolabellisation process and consequenly contribute to mitigate the negative effects of socio-economical activities on the cetaceans, under the umbrella of ACCOBAMS and in the framework of the PELAGOS sanctuary. At this stage, a first inventory has been made and the following regulations will be studied in their overall provisions : UN Convention on the Law of the sea/1982, the Conventions on pollution issues (London/1972, London/1973 and the MARPOLE protocol/1978, Basel/1989, London/2001), the OSPAR, Bucarest, Bern/1979, CITES and Bonn/1979 Conventions, the Barcelona system (the Convention itself/1976 and its protocols).

The main characteristics of the legal status of the marine resources, especially the cetaceans (Washington/1946), in the geographic scope of the two agreements, will be also reviewed, in a sense that those tools may contribute and/or facilitate the creation of standards and processes, for recognizing or establishing the best uses and activities for the conservation of cetaceans.

This part will be followed by a review of the legal status of commercial and non commercial operations, which are generally considered to have, or may have in the future, particular and significant effects on cetaceans conservation (**Part 2**); socio-economic activities like fisheries, therapies, tourism, and a series of diverse other economic and social activities, will be studied, in relation with their direct or indirect effects on cetaceans, and good examples of specific regulations and planning approaches to be extended in more countries from the region, will be given.

The last part will be concentrated on the direct conservation of cetaceans in the region, through the conservation of both the species themselves and their habitats. Most of the thirty species concerned are already strictly protected, but most of them also suffer from by-catching and/or disturbances from diverse sources, even though they take benefit of a legal protection. It will be paid attention in this part of the report to the different ways which can be used for completing and strengthening this legal protection, by developing non binding tools, like codes of practice, code of ethics, guidelines, etc, as well as certification and labelling processes, which may be encouraged and promoted by the governments. The direct role of the ACCOBAMS and PELAGOS organizations in the scaterring of those tools (parties, committee and secretariat) will be studied.

Tracks for action and technical work to be continued by the Committee and the other bodies of the two agreements will be given.

To conclude and in accordance with the terms of reference of this survey, it is more the rationale for a technical guidance for developing realistic initiatives, to mitigate the effects of socioeconomic activities on cetaceans, which is expected from this report, than detailed actions.

Istanbul, 21st November 2003.

ANNEX XXX

PREY DEPLETION

Cetacean prey depletion in the ACCOBAMS Area

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INTRODUCTION

This paper aims (1) to summarize current knowledge about nutritional stress in Mediterranean cetaceans, and (2) to make recommendations about how to investigate this further.

Nutritional stress has been defined as a negative physiological and/or behavioural state resulting from suboptimal quantity or quality of food available to an animal. Effects of and responses to nutritional stress in terrestrial and marine mammals include reduced body size, reduced birth rates, increased neonate mortality, increased juvenile mortality, behavioural modifications (e.g. longer foraging bouts), and changes in blood chemistry and body composition (Trites & Donnelly, 2003).

As stressed by Chapman & Reiss (1999), the lack of sufficient food to maximise reproductive potential may be the most important regulator of population size in animals. Unfortunately, it is difficult to assess whether nutritional stress is a contributing factor to the decline of any particular population. The “nutritional quality” of a diet to an animal is a complex matter to assess given the range of components that can influence its value. The effects of different diets on animal health are equally complex, and are particularly difficult to assess in large, wild animals. Just how large the nutritional insult must be to noticeably affect blood chemistry, behaviour, growth, survival and reproduction is not known; nor is it known if these changes occur in progressive and predictable manners (Trites & Donnelly, 2003).

Overfishing, as well as habitat degradation, may contribute to the decline of cetaceans by affecting the availability and/or the quality of their prey.

CETACEAN PREY DEPLETION IN THE ACCOBAMS AREA

Jackson *et al*. (2001) argued that "ecological extinction caused by overfishing precedes all other pervasive human disturbance to coastal ecosystems, including pollution, degradation of water quality,and anthropogenic climate change". This lesson likely also applies to the Mediterranean and Black Seas, where fisheries have had major direct and indirect impacts on ecosystem dynamics (e.g. Briand, 2000; Bushuyev, 2000; FAO, 2000).

Although Mediterranean fisheries statistics are incomplete and unreliable, and there is an acute lack of historical data (Briand, 2000), the available evidence indicates that unsustainable harvesting has led to the decline of many fish stocks (Caddy & Griffiths, 1990; De Walle *et al*., 1993; Stanners & Bourdeau, 1995; Briand, 2000; FAO, 2000), with potentially serious ecological consequences (cf. Dayton *et al.,* 1995; Jackson *et al*., 2001).

The mean trophic level of Mediterranean catches has declined significantly and quite steadily since the late 1950s, although aggregate fishery landings have increased (e.g. Pauly & Palomares, 2000; Stergiou & Koulouris, 2000). Such a pervasive and large-scale "fishing down" impact on food web dynamics (*sensu* Pauly *et al*., 1998) is likely to have a profound impact on ecosystem dynamics, ultimately affecting top predators.

However difficult it may be to establish a clear, mechanistic link between fisheries and the decline of some cetacean species such a link provides one of the most plausible contending hypotheses for coastal odontocetes such as short-beaked common dolphins *Delphinus delphis* and common bottlenose dolphins *Tursiops truncatus* (Bearzi, 2002). Exploitative competition with fisheries represents a source of concern in all the Mediterranean areas where common dolphins have been studied consistently, including the eastern Ionian Sea, the south-eastern Tyrrhenian Sea, and the Alboràn Sea (Bearzi *et al*., 2003).

When mass mortality events occur, prey depletion and xenobiotic contamination are often mentioned as potentially contributing factors having compounding effects. For example, inadequate nutrition may have compromised animal health and made Mediterranean striped dolphins *Stenella coeruleoalba* more susceptible to the epizootic that caused a large die-off in 1990-1992 (Aguilar & Raga, 1993; Aguilar, 2000).

In the Black Sea, reduced prey availability has been cited as a factor affecting the abundance of shortbeaked common dolphins and harbour porpoises *Phocoena phocoena* (Bushuyev, 2000). Of two mass mortality events involving Black Sea common dolphins in 1990 and 1994 (Krivokhizhin & Birkun, 1999), only one was recognised as being the result of a morbillivirus epizootic (Birkun *et al*., 1999). Most stranded animals (dead and alive) examined during both die-offs were emaciated (A. Birkun, pers. comm.). Although such emaciation could be a result of the disease, both die-offs coincided with steep declines of European anchovy *Engraulis encrasicolus* and European sprat *Sprattus sprattus* stocks, the main prey of Black Sea common dolphins (Birkun, 2002). Overfishing, combined with the consequences of eutrophication (e.g. water hypoxia) and the concurrent irruption of the introduced ctenophore *Mnemiopsis leidyi*, has been blamed for the rapid decline in anchovy and sprat stocks (Zaitsev & Mamaev, 1997). The total commercial catch of anchovies experienced a 12-fold decline (from an absolute maximum of 468,800 tonnes in the 1987-1988 fishing season to 39,100 tonnes in 1990-1991), while landings of sprat fell by a factor of nearly eight (from 105,200 tonnes in 1989 to 13,800 tonnes in 1993; Prodanov *et al*., 1997). This suggests a close relationship between large die-offs of Black Sea common dolphins and prey scarcity (A. Birkun, pers. comm).

INVESTIGATING NUTRITIONAL STRESS IN CETACEANS: A CHALLENGING TASK

The complexity of marine food webs and a troublesome access to the relevant data make it difficult to provide quantitative evidence that nutritional stress represents a threat to cetaceans. Prey depletion may be a subtle and scarcely noticeable threat, and the impacts may go unnoticed owing to inadequate research effort (e.g. monitoring changes in reproductive success or survival rates).

Work done on pinnipeds in recent years may be especially valuable to indicate how the problem may be approached. For instance, research conducted in Alaska by Trites & Donnelly (2003) has shown that declining Steller sea lion (*Eumetopias jubatus*) populations were nutritionally compromised because of the **quality** of prey available to them (chronic nutritional stress), rather than because of the overall **quantity** of fish *per se* (acute nutritional stress). This suggests that prey quality is at least as important as quantity when it comes to evaluating the potential impact on the animals - a consideration that so far has been overlooked by most cetacean studies conducted in the Agreement area.

Energetic requirements of top level predators can be used to infer the probable ecosystem structure. Energy consumption by cetaceans can be based on the number of individuals present in a given area at any time, their trophic level, the food requirements of each individual, and the rates of energy transfer between trophic levels (Hooker *et al*., 2002). Although it is difficult to perform studies on cetaceans similar to those carried out on pinnipeds (e.g. based on blood chemistry, accurate body size measurements etc.), viable research approaches can be identified to evaluate nutritional stress in freeranging cetaceans through non-invasive techniques. To this regard, a multi-disciplinary approach based on a combination of research methods may provide valuable results.

A variety of different methods can be used to gain insight into what cetaceans eat. These include the following ones, each presenting advantages and disadvantages (e.g. see Barros & Clarke, 2002):

1) Intestine and stomach contents performed in stranded animals can be studied to identify the structures representing a typical meal, e.g. fish bones and the jaws of cephalopods. Fish otoliths and lower cephalopod beaks, in particular, are diagnostic structures in the identification of prey (Barros & Clarke, 2002).

2) Systematic behavioural sampling and the study of surfacing patterns by focal individuals may provide insight on preferred prey type (e.g. epipelagic vs. demersal), and help assessing the time devoted to feeding and the related energy investment as compared with temporal and environmental variables (Fortuna *et al*., 1998; Bearzi *et al*., 1999).

3) Isotopes in biopsy samples can be analyzed to obtain information on cetacean prey preferences (Todd *et al*., 1997), as well as on food preferences by other ecosystem components (Das *et al*., 2000; Polunin & Pinnegar, 2000; Lesage *et al*., 2001). Remotely-obtained skin biopsies may be used in isotope analysis and thus provide an alternative to the examination of stomach contents to delineate diet. Dietary evaluations based on analyses of assimilated tissues implies that the data reflects dietary information integrated over a longer period of time, as opposed to the instantaneous sampling of recently digested food items. With the added possibility of re-sampling photo-identified individuals between seasons or years, isotope analysis may also be used in longitudinal studies of foraging behaviour (Todd *et al*., 1997). Stable isotope analyses performed on teeth from museum collections and stranded individuals may provide comparative insight on the diet of modern as compared with historical cetacean populations (Walker & Macko, 1999; Walker *et al*., 1999).

4) Fatty acids analysis can be useful in reconstructing changes in diet (e.g. Hooker *et al*., 2001), although this method presents shortcomings related to fat stratification in the outer and inner blubber layer, which may yield misleading results of dietary information (Barros & Clarke, 2002).

5) Finally, biochemical analyses of lipid contents/structure in blubber from biopsies may, in the future, help detecting starvation or nutritional stress.

Information collected through “traditional” studies can also be directly or indirectly relevant to nutritional and ecosystem studies. For instance, individual photo-identification (Hammond *et al*., 1990) may help assessing population numbers and dynamics, habitat use, immigration rates, calving and survival rates, and a number of other key biological features including information on the physical appearance of known individuals over time (e.g. emaciated vs. well-fed, Politi *et al*., 2000). Genetic studies performed on swabbed skin samples (Harlin *et al*., 1999) or stranded animals may help assessing - among other things - genetic variability and the degree of isolation of a given cetacean community, which can represent relevant background for food-web studies.

In addition to the approaches described above, ecosystem modelling has been proposed in recent years as a viable tool for understanding the complex ecological interactions between cetaceans, fisheries and other ecosystem components (*e.g.*, Smith, 1995; Earle, 1996). For effective conservation policy it is widely recognized that an ecosystem-level approach is more effective than that at species-level (Agardy, 1994; Jones, 1994). However, such an approach is often difficult. Theoretically, an ecosystem should encompass all the linkages between species within a defined habitat, but the spatial boundaries of marine ecosystems are mostly nebulous. Ideal “natural laboratories” for ecosystem studies focusing on coastal cetaceans may be represented by closed or semi-closed systems with low rates of immigration and emigration, where cetacean numbers, age classes and diet, as well as prey quantity and removal rates by fisheries can be determined more precisely than in open systems.

If given proper development and implementation, and applied on systems for which sufficient information exists, software tools such as “Ecopath-Ecosim” (Christensen & Pauly, 1992) may benefit our understanding of food-web dynamics and future cetacean management. Models can provide information on food consumption of cetaceans as compared with fisheries catches, and indicate the degree of resource overlap (Kaschner *et al*., 2001). This approach to the study of marine food webs and cetaceanfisheries interactions may help to identify areas of conflict and serve as a useful management tool in the context of defining critical habitat for cetaceans.

Indeed, an ecosystem approach, involving a thorough assessment of the nature and scale of the trophic interactions involved in any marine conservation area is needed for rigorous conservation planning, both within and outside of marine protected areas (Kaschner *et al*., 2001; Hooker *et al*., 2002).

THE PROPOSED APPROACH

We suggest that the problem be approached as follows:

1. The potential relevance of the impact of prey depletion on cetaceans populations should be recognised.

2. The objective difficulties of addressing the issue scientifically should be discussed, and a precautionary approach adopted to compensate for high uncertainty levels.

3. Collaborations with expert groups working on nutritional stress and prey depletion within and outside of the Agreement area should be facilitated

4. Research focusing on this issue should be encouraged and appropriately funded

5. Areas where ecosystem dynamics and food-web interactions can be studied under ideal conditions should be given special consideration, and measures should be taken to ensure regional and international support aimed at facilitating multi-disciplinary research in those areas

6. Application of ecosystem modelling as a tool to explore ecosystem dynamics and assess the impact of current fishing pressure on cetaceans should be promoted

7. Investigations aimed at evaluating cetacean-fisheries interactions should consider both the direct and indirect impacts of fishing such as, for instance, the mechanical destruction of sea floor and complex food-web interactions (*sensu* Trites *et al*., 1997).

Practical measures to achieve the goals listed above may include the following ones:

1. Organize of a workshop of experts to discuss theoretical aspects, develop appropriate research methods, and help in the organisation of targeted research programmes[1]

[1] A CIESM Workshop on this is being planned for the near future.

2. Select the most promising studies and provide support to research projects which purpose is to study food-web dynamics through focused investigations conducted in study areas where conditions are simplified, representing ideal "natural laboratories" (*sensu* Wells, 1991) where ecosystem and cetacean population dynamics can be investigated, and the impact of fishing assessed

3. Promote comparative observations among similar areas (in terms of presence and importance of cetaceans, type of food web, etc.) where the main difference is in the human pressure (e.g. comparisons between protected and non-protected areas).

Scientific findings should be promptly incorporated into management (e.g., establishment of MPAs, regulation of fisheries in or around MPAs, use of ADDs etc.). In addition, monitoring schemes and a system of indicators should be set up to evaluate the effectiveness of management measures (e.g. see WDCS, 2003).

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ANNEX XXXI

INDICATORS

Approaches to the assessment of the successes of the conservation of Cetaceans in the ACCOBAMS area:

A discussion document[101]

Whale and Dolphin Conservation Society

janvier 30, 2004

ACCOBAMS is concerned with species protection and this will require the monitoring and management of issues beyond the species themselves, including the ecosystem in which species or populations live and on which they depend.

This paper seeks to outline the three key sets of indicators that can be used to assess the success of ACCOBAMS over time. The first set of species indicators seeks to provide accurate baseline information about population trends, mortalities and distribution. The second set of indicators seeks to outline ecosystem indicators to assess ecosystem health and threats. The third set of indicators seeks to outline institutional indications of success. Together these three indicator sets provide a fuller picture of the condition of identified species, populations and sub-populations, the environment on which they depend and the institutional changes that ACCOBAMS has to address to meet it's cetacean protection and conservation aims.

In their report on environmental indicators, Ward, Butler and Hill (1998) list five key attributes of marine ecosystems – diversity, stability, yields, productivity and resilience. These can be used '*to guide the development of indicators for the purpose of assessing the status and survivability of species, the condition of ecosystems and their components and processes, and to assess the success of an integrated management framework'*. [102]

According to Ward, Butler and Hill there are three indicator types and these measure the:

- condition of an issue, condition, area or action
- pressure on the issue, condition, area, action or more broadly the environment
- management in response to threats to the issue, condition, area, action or more broadly the environment

Examples of these three indicator types are outlined in the following two tables, with a description of each indicator and the issues and elements to which they apply. The third tables deals more specifically with institutional indicators. The lists provided within the tables are not comprehensive and should be used as a guide only.

Using appropriate species, population and sub-population indicators

It is important to understand both species, population or sub-population numbers and trends, as well as tracking changes to genetically isolated populations, to be able to assess the success of ACCOBAMS. This information should be overlaid with the ecosystem indicator information (table 2) to get a more detailed picture of the species, population or sub-population recovery responses and environmental trends.

Table 1: Key species, population and sub-population indicators that can be used to measure approaches to species protection

[101] Please note that these are not hard and fast recommendations from WDCS at this time but that this document is presented to assist further discussion.

[102] Ward T, Butler E, and Hill B, 1998, *Environmental indicators for national state of the environment reporting: estuaries and the sea*, CSIRO Division of Marine Research (Environment Australia).

Issue or element	Condition indicator	Outputs
1. Species, populations and sub-populations	Examples: Numbers of individual animals within a species, population or sub-population The study of this indicator is the core unit for assessment of the management regime. Positive trends with these indicators can be used as a direct measure of success	• Number of species, population or sub-population • Number of species, population or sub-population and/or percentage presumed endangered, vulnerable or extinct • Percentage of species, population or sub-population known to be changing in distribution • Maps annotated with tables indicating species, population or sub-population distribution and movement/migrations • Maps annotated with tables indicating habitat and prey aggregations used by species, population or sub-population, including the identification of critical habitat
Issue or element	**Pressure indicator**	**Outputs**
2. Species, populations and sub-populations	Examples: Numbers of individual animals affected by an impact within a species, population or sub-population The use of these indicators show direct species, population or sub-population impacts	• Number of mortalities per species, population or sub-population • Number of strandings per species, population or sub-population • Analysis or mortalities caused by identified threatening processes and cumulative impacts
Issue or element	**Response indicator**	**Outputs**
3. Species, populations and sub-populations trends.	Examples: Changes to numbers of individuals animals affected by an impact within a species, population or sub-population The use of these indicators show trends for species, population or sub-population	• Assessment of changes in population trends (#1) and habitat conditions (table 2: #4, 5, 7, 10) • Assessment of distribution and migration patterns • Assessment of the use of and accessibility to critical habitat and prey species

Using appropriate environmental indicators

Environmental indicators are '…*physical, chemical, biological or socio-economic measures that best represent the key elements of a complex ecosystem or environmental issues*.'[103] They are used to provide data on major trends and impacts within and on ecosystems, and give feedback on ecosystem health. This information, in turn, can be used to assess the success of management framework that intends to protect and allow for the recovery of cetacean populations. Indicators should reflect highly valued aspects and relevant conditions of the environment as well as being robust indicators of environmental change.

[103] Commonwealth of Australia, 1996, 'Key environmental indicators for estuaries and the sea': proceedings of a workshop. State of the Environment Reporting Unit, Commonwealth Department of Environment, Sport and Territories, Canberra

Table 2: Key marine environment indicators that can be used to measure approaches to species protection

Issue or element	Condition indicator	Outputs
4. Habitat extent	Examples: Algal bed area; reef area; dune vegetation; intertidal reef area; intertidal sand/mudflat area; saltmarsh area; seagrass area; prey aggregation; or other ecosystem features that constitute important habitat for a specific species, population or sub-population The use of these indicators ensure that habitat loss does not occur, and that change is able to be monitored	• Maps annotated with tables of number of specific habitat types together with percentages of significant change • Maps annotated with tables of number of prey aggregation together with percentages of significant change
5. Habitat quality	Examples: Algal bed species; algal blooms; beach species; reef species; fish populations; intertidal reefs species; intertidal sand/mudflat species; saltmarsh species; seamount species; seagrass species; chlorophyll concentrations The use of these indicators ensure that the integrity of each identified habitat type/s are assessed in a more detailed manner	• Maps annotated with tables summarizing change in species assemblages by site and sub-region, together with percentages of significant change • Maps annotated with tables indicating change in bloom frequency together with percentages of significant change
6. Ecosystem process	Examples: Sea level; sea surface temperature variability The use of these indicators are broad scale and related to important functions or process within ecosystems and can assist with interpreting trends	• Maps highlighting annual rise and falls and long terms changes (where records exist) • Maps showing mean temperature and a measure of temporal variability
Issue or element	**Pressure indicator**	**Outputs**
7. Habitat quality	Examples: Algal blooms; pest numbers; species outbreaks; threatening processes The use of these indicators provide information about the pressure to each identified habitat type	• Documentations of annual events and outbreaks • Analysis of trends revealed through mapping exercises (#4, 5, 6) • Documentation of threatening processes (such as bycatch) and analysis of trends • Maps annotated with tables indicating threatening processes by area
8. Water and sediment quality	Examples: Sentinel accumulator program; turbidity; water nutrients (nitrogen); biopsy samples (contamination); sediment quality (contaminants) The use of these indicators document the level of contaminants within the system and food chains and can be used to assess the pressure on specific species and systems	• Maps annotated with tables summarizing change in water and sediment quality by site and sub-region, together with percentages of significant change • Maps indicating nitrogen species and total nitrogen
9. Integrated management	Examples: Catchment development; coastal discharges; coastal population; coastal tourism; ship visits; shipping accidents; fisheries management; extent of whale watching	• Maps and reports indicating management plans and monitoring activities. This should cover plans that seek to integrate with the objectives of

	The use of these indicators measure human pressures	ecosystem based management and those that do not • Annual reports of accents and/or events of note

Issue or element	Response indicator	Outputs
10. Habitat quality and extent	Examples: Algal bed area; reef area; dune vegetation; intertidal reef area; intertidal sand/mudflat area; saltmarsh area; seagrass area; prey aggregation; or other ecosystem features that constitute important habitat for a specific species, population or sub-population The use of these indicators provide information about the changes over time in response to threatening process management	• Analysis of trends in habitat change
11. Integrated management	Examples: Integration of management; beach stabilisation; catchment management programs; coastal care community groups; management of fishing effects on non-target species and biodiversity; critical habitat protected areas The use of these indicators measure and directly analyze management effectiveness	• Assessment of management effectiveness, responsiveness and impact on protecting species/populations • Analysis of species, populations or sub-populations explicitly protected under legislation • Maps annotated with tables indicating areas of critical habitat under specific protection

Using appropriate institutional indicators

It should also be possible to identify and refine indicators that are critical to the institutional development of ACCOBAMS. For example, if an aim of ACCOBAMS is to have the widest possible representation (membership) within the area of the agreement, then the best institutional indicator could be "membership" and this could be refined to consider each sea area or coastline. Other institutional aims of ACCOBAMS could also be considered in the same fashion.

Table 2: Key institutional indicators for ACCOBAMS

Issue or element	Institutional indicator	Outputs
12. Membership/ regional representation	Examples: ACCOBAMS Parties; sea area represented; coastline represented The use of these indicators measure the coverage of ACCOBAMS within the area and by coastline	• List of Parties and State ratification • Maps of area representation, indicating gaps without contracting Parties • Maps of coastline representation, indicating gaps without contracting Parties
13. Appropriate national legislation	Examples: Laws enacted by Party; laws in progress by Party; laws drafted by Party The use of these indicators measure the uptake of the ACCOBAMS provisions within domestic jurisdictions	• Assessment of laws enacted, in progress and in draft by Parties, including comparable provisions and the ability of the Party to implement ACCOBAMS provisions in

		their domestic jurisdiction • Assessment of time per Party to have fully comparable legislative instruments from the point of ratification
14. Complementary conservation programs at national level	Examples: bycatch and fisheries interaction measures; habitat protection; whale watching guidelines The use of these indicators measure the uptake of the ACCOBAMS provisions within domestic jurisdictions	• Assessment of conservation measures implemented by Parties in their domestic jurisdiction • Assessment of time per Party to implement complementary conservation measures form the point of ratification
15. Relations with other regional bodies/stakeholders	Examples: other organisational programs that support to aims of ACCOBAMS; regional framework of organisations/ stakeholders The use of these indicators measure the extent to which ACCOBAMS aims are supported by other organisations and institutions	• Audit and analysis of cross cutting joint projects that support the aims ACCOBAMS • Audit and analysis organisations and stakeholders that support the aims ACCOBAMS • Map of program overlay with ACCOBAMS aims and workplan indicating gaps without sufficient program attention
16. Compliance and stakeholder participation	Examples: transparent process; national reporting; institutional capacity; finance The use of these indicators measure the extent to which ACCOBAMS is complied with	• Audit of ACCOBAMS compliance and stakeholder participation
17. Action plan progress	Examples: Action plan actions The use of these indicators measures the extent to which ACCOBAMS aims have been successful	• Audit and analysis of action plan activities against agreed timelines • Audit and analysis of action plans amendments required after assessing the full range of institutions and ecosystem indicators

ANNEX XXXII

RELEASE OF DOLPHINS IN THE BLACK SEA

Release of Black Sea Dolphins

GIUSEPPE NOTARBARTOLO DI SCIARA, CHAIR
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SCIENTIFIC COMMITTEE
5 November 2003

Dr. Simon C. Nemtzov
Wildlife Ecologist and Scientific Authority for CITES
Israel Nature and Parks Authority
3 Am Ve'Olamo Street
Jerusalem 95463, Israel

Dear Dr. Nemtzov:
As you know from previous recent correspondence, this Committee was consulted as a matter of urgency by the Executive Secretary of ACCOBAMS concerning the prospected release in the Black Sea of bottlenose dolphins which are currently being kept in captivity in Red Sea waters.

A fast-track correspondence procedure, thus initiated ten days ago, ended yesterday and allowed the collection of opinions from members of the Scientific Committee as well as from Dr. Randall S. Wells, a leading expert in matters concerning the release of bottlenose dolphins in the wild.

I also understand from our recent exchanges that the plans for the dolphins' release in the Black Sea may not be as immediate as previously anticipated, and that the consequent availability of additional time will enable further discussions on this issue at the forthcoming meeting of this Agreement's Scientific Committee (Istanbul, 20-22 November), where we may have the honour of your participation.

Members of the Scientific Committee are concerned that captive releases of this sort may jeopardise wild dolphin populations in the region. Exotic pathogens contracted during the dolphins' permanence away from the release area may be transmitted to the local populations, potentially with very harmful consequences. The introduction in the genome of Black Sea dolphin populations of foreign genes is also a risk, if the animals to be released are not of pure Black Sea descent.

Furthermore, although considerations on the welfare of the animals may be regarded as peripheral to our mandate, I would like to voice the Committee's concerns about the chances of survival of the dolphins once they will be released. We wonder what consideration was given to the need of the dolphins to acclimatise to the rigours of late autumn/winter Black Sea temperatures, after they have resided for an extensive period (in most cases all their life) in tropical waters.

Although the merit of the good intentions must be recognised of returning the dolphins to the Black Sea, where they seem to ideally belong, based on the considerations given above this Committee does not recommend to proceed with the action at this time. To the contrary, our recommendation is that operations be suspended until further elements are provided, and that in the interim proper consultations be made with all Black Sea Riparian States and with the scientific community. Potential impacts on the host population need to be weighed most carefully. Assurance should be provided that appropriate steps have been taken to prevent transmission of disease from the captives to the wild population. Plans should include sufficient post-release monitoring effort and contingency plans for re-capture if the animals fail to thrive. The release of captive-born individuals raises additional concerns.

Should plans for the release of the dolphins continue, this Committee declares its availability to cooperate with the interested parties to help properly addressing the concerns mentioned above.
In particular, in further planning we would like to attract your attention to the following points (partly from R.S. Wells, pers. com.):

• To avoid the risk of genetic mixing, only pure Black Sea dolphins may be released in the Black Sea. Information is needed on the animals' ascent through studbooks (and DNA verification if needed). Ensure that release occurs in same area of capture.
• To avoid the risk of pathogen transmission, dolphins must be quarantined for an appropriate duration of time before their release, and also before keeping them in sea pens in the Black Sea. Carefully evaluate risks to the best of pathological, bacteriological, virological and parasitological knowledge.
• Acclimatisation. Optimal time of year should be selected for release, when local water temperatures offer best matches to those experienced during captivity. Efforts should be made to match blubber thickness and water temperature regimes between the captive facility and the re-adaptation site well in advance of the transfer. Body condition should be monitored prior to release and compared to residents. Familiarity with, or morphological or physiological adaptations to, the physical habitat, environmental features (e.g., tides, currents, water temperature regimes), food resources, and the social system of resident dolphins are likely to play a role in increasing the chances for a successful reintroduction. Efforts should be made to learn about the local dolphin prey, and to locate sources of fresh and live prey for readaptation. Obtain background information on home ranges and social patterns of resident dolphins prior to the release. This will facilitate selection of appropriate monitoring methodology and logistics.
• Ability to function as a team. Functinal social units are based on similar natural combinations of age and sex classes. Sex and age segregation are important features of bottlenose dolphin societies.
• Decision on whether individual dolphins are fit for release. Each potential release should be considered individually in an experimental context, with careful evaluation of the potential effects of all the variables at play. It is likely that animals with precapture experience in fending for themselves might have an advantage over either dolphins taken from their mothers in the wild at an age of 2-3 years, or captive-born
dolphins. Also, older dolphins with a history of poor response to new situations (e.g., becoming inappetent, ill, or lethargic) might be poor candidates.
• Plans should be made well in advance for monitoring the re-assimilation of the dolphins. There should be a contingency plan as well for re-capture during the first few weeks if it appears that an animal is not thriving, and for another release attempt or placement of the animal after recapture.
• Establish a "half-way house" at or near the release site. Such a facility might also provide a means of gradually returning the animals to the wild, through open-ocean release training. If the facility was available to the animals after release, it might provide them a haven if they become ill or otherwise incapacitated. Use of the facility would facilitate monitoring their condition.

Finally, I would like to point you to two very useful references, should you be interested in learning more about the issue and on relevant previous experience:

Gales, N. and K. Waples. 1993. The rehabilitation and release of bottlenose dolphins from Atlantis Marine Park, Western Australia. Aquatic Mammals 19:49-59.

Wells, R.S., K. Bassos-Hull and K.S. Norris. 1998. Experimental return to the wild of two bottlenose dolphins. Marine Mammal Science 14:51-71.

We look forward to meeting you in Istanbul in two weeks and to making progress in this discussion.

Yours sincerely,

Giuseppe Notarbartolo di Sciara

ANNEX XXXIII

UPDATING OF APPENDICES TO CMS

CMS Convention (see text attached) provides two appendices:

- species whose status is considered as endangered (appendice I) and need strict protection measures and concerted actions;

- species whose status is considered as unfavourable for which the Convention calls for Agreements to stimulate co-ordinated conservation actions through Agreements (ASCOBANS, ACCOBAMS, AEWA, EUROBATS, …), Memorandum of understandings or Action Plans.

ACCOBAMS area cetaceans are included in both appendices I and II as presented here below.

The data used to draft these lists could benefit from an updating based on the ACCOBAMS Scientific Committee expertise. Amendments to the CMS appendices are foresee in Article XI of the Convention.
The Scientific Committee could prepare a recommendation to the Meeting of the Contracting Parties of ACCOBAMS (November 2004). This Meeting could wish to recommend to the next CMS COP to amend the appendices.

Cetaceans in Appendix I
OF THE CONVENTION ON THE CONSERVATION OF MIGRATORY SPECIES OF WILD ANIMALS (CMS)

(as amended by the Conference of the Parties in
1985, 1988, 1991, 1994, 1997, 1999 and 2002)
Effective: 23 December 2002

Interpretation

1. Migratory species included in this Appendix are referred to:
   a) by the name of the species or subspecies; or
   b) as being all of the migratory species included in a higher taxon or designated part thereof.

2. Other references to taxa higher than species are for the purposes of information or classification only.

3. The abbreviation for *sensu lato* "(s.l.)" is used to denote that the scientific name is used in its extended
meaning.

4. An asterisk (*) placed against the name of a species indicates that the species, or a separate population of that species, or a higher taxon which includes that species is included in Appendix II.

CETACEA

Physeteridae	*Physeter macrocephalus* *
Platanistidae	*Platanista gangetica gangetica* *
Pontoporiidae	*Pontoporia blainvillei* *
Balaenopteridae	*Balaenoptera borealis* *
	Balaenoptera physalus *
	Balaenoptera musculus
	Megaptera novaeangliae
Balaenidae	*Balaena mysticetus*
	Eubalaena glacialis[2] (North Atlantic)
	Eubalaena japonica[3] (North Pacific)
	Eubalaena australis[4]

2 Formerly included in *Balaena glacialis glacialis*
3 Formerly included in *Balaena glacialis glacialis*
4 Formerly listed as *Balaena glacialis australis*

Cetaceans in Appendix II
OF THE CONVENTION ON THE CONSERVATION
OF MIGRATORY SPECIES OF WILD ANIMALS (CMS)

(as amended by the Conference of the Parties in
1985, 1988, 1991, 1994, 1997, 1999 and 2002)
Effective: 23 December 2002

Interpretation

1. Migratory species included in this Appendix are referred to:
   a) by the name of the species or subspecies; or
   b) as being all of the migratory species included in a higher taxon or designated part thereof.

Unless otherwise indicated, where reference is made to a taxon higher than species, it is understood that all the migratory species within that taxon could significantly benefit from the conclusion of AGREEMENTS.

2. The abbreviation "spp." following the name of a Family or Genus is used to denote all migratory species within that Family or Genus.

3. Other references to taxa higher than species are for the purposes of information or classification only.

4. The abbreviation "(s.l.)" is used to indicate that the scientific name is used in its extended meaning.

5. An asterisk (*) placed against the name of a species or higher taxon indicates that the species, or a separate population of that species, or one or more species included in that higher taxon is included in Appendix I.

Mammalia

CETACEA

Physeteridae	*Physeter macrocephalus* *
Platanistidae	*Platanista gangetica gangetica*1 *
Pontoporiidae	*Pontoporia blainvillei* *
Iniidae	*Inia geoffrensis*
Monodontidae	*Delphinapterus leucas*
	Monodon monoceros
Phocoenidae	*Phocoena phocoena* (North and Baltic Sea populations, western North Atlantic population, Black Sea population)
	Phocoena spinipinnis
	Phocoena dioptrica
	Neophocaena phocaenoides
	Phocoenoides dalli
Delphinidae	*Sousa chinensis*
	Sousa teuszii
	Sotalia fluviatilis
	Lagenorhynchus albirostris (only North and Baltic Sea populations)
	Lagenorhynchus acutus (only North and Baltic Sea populations)
	Lagenorhynchus obscurus
	Lagenorhynchus australis
	Grampus griseus (only North and Baltic Sea populations)

	Tursiops aduncus (Arafura/Timor Sea populations)
	Tursiops truncatus (North and Baltic Sea populations, western Mediterranean population, Black Sea population)
	Stenella attenuata (eastern tropical Pacific population, Southeast Asian populations)
	Stenella longirostris (eastern tropical Pacific populations, Southeast Asian populations)
	Stenella coeruleoalba (eastern tropical Pacific population, western Mediterranean population)
	Delphinus delphis (North and Baltic Sea populations, western Mediterranean population, Black Sea population, eastern tropical Pacific population)
	Lagenodelphis hosei (Southeast Asian populations)
	Orcaella brevirostris
	Cephalorhynchus commersonii (South American population)
	Cephalorhynchus eutropia
	Cephalorhynchus heavisidii
	Orcinus orca
	Globicephala melas (only North and Baltic Sea populations)
Ziphiidae	*Berardius bairdii*
	Hyperoodon ampullatus
Balaenopteridae	*Balaenoptera bonaerensis*
	Balaenoptera edeni
	Balaenoptera borealis *
	Balaenoptera physalus *
Neobalaenidae	*Caperea marginata*

Convention on the Conservation of Migratory Species of Wild Animals

The Contracting Parties,

RECOGNIZING that wild animals in their innumerable forms are an irreplaceable part of the earth's natural system which must be conserved for the good of mankind;

AWARE that each generation of man holds the resources of the earth for future generations and has an obligation to ensure that this legacy is conserved and, where utilized, is used wisely;

CONSCIOUS of the ever-growing value of wild animals from environmental, ecological, genetic, scientific, aesthetic, recreational, cultural, educational, social and economic points of view;

CONCERNED particularly with those species of wild animals that migrate across or outside national jurisdictional boundaries;

RECOGNIZING that the States are and must be the protectors of the migratory species of wild animals that live within or pass through their national jurisdictional boundaries;

CONVINCED that conservation and effective management of migratory species of wild animals require the concerted action of all States within the national jurisdictional boundaries of which such species spend any part of their life cycle;

RECALLING Recommendation 32 of the Action Plan adopted by the United Nations Conference on the Human Environment (Stockholm, 1972) and noted with satisfaction at the Twenty-seventh Session of the General Assembly of the United Nations,

HAVE AGREED as follows:

Article I
Interpretation

1. For the purpose of this Convention:

a) "Migratory species" means the entire population or any geographically separate part of the population of any species or lower taxon of wild animals, a significant proportion of whose members cyclically and predictably cross one or more national jurisdictional boundaries;
b) "Conservation status of a migratory species" means the sum of the influences acting on the migratory species that may affect its long-term distribution and abundance;
c) "Conservation status" will be taken as "favourable" when:
(1) population dynamics data indicate that the migratory species is maintaining itself on a long-term basis as a viable component of its ecosystems;
(2) the range of the migratory species is neither currently being reduced, nor is likely to be reduced, on a long-term basis;
(3) there is, and will be in the foreseeable future sufficient habitat to maintain the population of the migratory species on a long-term basis; and
(4) the distribution and abundance of the migratory species approach historic coverage and levels to the extent that potentially suitable ecosystems exist and to the extent consistent with wise wildlife management;
d) "Conservation status" will be taken as "unfavourable" if any of the conditions

set out in sub-paragraph (c) of this paragraph is not met;
e) "Endangered" in relation to a particular migratory species means that the migratory species is in danger of extinction throughout all or a significant portion of its range;
f) "Range" means all the areas of land or water that a migratory species inhabits, stays in temporarily, crosses or overflies at any time on its normal migration route;
g) "Habitat" means any area in the range of a migratory species which contains suitable living conditions for that species;
h) "Range State" in relation to a particular migratory species means any State (and where appropriate any other Party referred to under subparagraph (k) of this paragraph) that exercises jurisdiction over any part of the range of that migratory species, or a State, flag vessels of which are engaged outside national jurisdictional limits in taking that migratory species;
i) "Taking" means taking, hunting, fishing capturing, harassing, deliberate killing, or attempting to engage in any such conduct;
j) "Agreement" means an international agreement relating to the conservation of one or more migratory species as provided for in Articles IV and V of this Convention; and
k) "Party" means a State or any regional economic integration organization constituted by sovereign States which has competence in respect of the negotiation, conclusion and application of international Agreements in matters covered by this Convention for which this Convention is in force.

2. In matters within their competence, the regional economic integration organizations which are Parties to this Convention shall in their own name exercise the rights and fulfil the responsibilities which this Convention attributes to their member States. In such cases the member States of these organizations shall not be entitled to exercise such rights individually.

3. Where this Convention provides for a decision to be taken by either a two-thirds majority or a unanimous decision of "the Parties present and voting" this shall mean "the Parties present and casting an affirmative or negative vote". Those abstaining from voting shall not be counted amongst "the Parties present and voting" in determining the majority.

Article II
Fundamental Principles

1. The Parties acknowledge the importance of migratory species being conserved and of Range States agreeing to take action to this end whenever possible and appropriate, paying special attention to migratory species the conservation status of which is unfavourable, and taking individually or in co-operation appropriate and necessary steps to conserve such species and their habitat.

2. The Parties acknowledge the need to take action to avoid any migratory species becoming endangered.

3. In particular, the Parties:
a) should promote, co-operate in and support research relating to migratory species;
b) shall endeavour to provide immediate protection for migratory species included in Appendix I; and
c) shall endeavour to conclude Agreements covering the conservation and management of migratory species included in Appendix II.

Article III
Endangered Migratory Species: Appendix I

1. Appendix I shall list migratory species which are endangered.

2. A migratory species may be listed in Appendix I provided that reliable evidence, including the best scientific evidence available, indicates that the species is endangered.

3. A migratory species may be removed from Appendix I when the Conference of the Parties determines that:

a) reliable evidence, including the best scientific evidence available, indicates that the species is no longer endangered, and
b) the species is not likely to become endangered again because of loss of protection due to its removal from Appendix I.

4. Parties that are Range States of a migratory species listed in Appendix I shall endeavour:

a) to conserve and, where feasible and appropriate, restore those habitats of the species which are of importance in removing the species from danger of extinction;
b) to prevent, remove, compensate for or minimize, as appropriate, the adverse effects of activities or obstacles that seriously impede or prevent the migration of the species; and
c) to the extent feasible and appropriate, to prevent, reduce or control factors that are endangering or are likely to further endanger the species, including strictly controlling the introduction of, or controlling or eliminating, already introduced exotic species.

5. Parties that are Range States of a migratory species listed in Appendix I shall prohibit the taking of animals belonging to such species. Exceptions may be made to this prohibition only if:

a) the taking is for scientific purposes;
b) the taking is for the purpose of enhancing the propagation or survival of the affected species;
c) the taking is to accommodate the needs of traditional subsistence users of such species; or
d) extraordinary circumstances so require; provided that such exceptions are precise as to content and limited in space and time. Such taking should not operate to the disadvantage of the species.

6. The Conferences of the Parties may recommend to the Parties that are Range States of a migratory species listed in Appendix I that they take further measures considered appropriate to benefit the species.

7. The Parties shall as soon as possible inform the Secretariat of any exceptions made pursuant to paragraph 5 of this Article.

Article IV
Migratory Species to be the Subject of Agreements: Appendix II

1. Appendix II shall list migratory species which have an unfavourable conservation status and which require international agreements for their conservation and management, as well as those which have a conservation status which would significantly benefit from the international cooperation that could be achieved by an international agreement.

2. If the circumstances so warrant, a migratory species may be listed both in Appendix I and Appendix II.

3. Parties that are Range States of migratory species listed in Appendix II shall endeavour to conclude Agreements where these should benefit the species and should give priority to those species in an unfavourable conservation status.

4. Parties are encouraged to take action with a view to concluding agreements for any population or any geographically separate part of the population of any species or lower taxon of wild animals, members of which periodically cross one or more national jurisdiction boundaries.

5. The Secretariat shall be provided with a copy of each Agreement concluded pursuant to the provisions of this Article.

Article V
Guidelines for Agreements

1. The object of each Agreement shall be to restore the migratory species concerned to a favourable conservation status or to maintain it in such a status. Each Agreement should deal with those aspects of the conservation and management of the migratory species concerned which serve to achieve that object.

2. Each Agreement should cover the whole of the range of the migratory species concerned and should be open to accession by all Range States of that species, whether or not they are Parties to this Convention.

3. An Agreement should, wherever possible, deal with more than one migratory species.

4. Each Agreement should:

a) identify the migratory species covered;
b) describe the range and migration route of the migratory species;
c) provide for each Party to designate its national authority concerned with the implementation of the Agreement.
d) establish, if necessary, appropriate machinery to assist in carrying out the aims of the Agreement, to monitor its effectiveness, and to prepare reports for the Conference of the Parties;
e) provide for procedures for the settlement of disputes between Parties to the Agreement; and
f) at a minimum, prohibit, in relation to a migratory species of the Order Cetacea, any taking that is not permitted for that migratory species under any other multilateral Agreement and provide for accession to the Agreement by States that are not Range States of that migratory species.

5. Where appropriate and feasible, each Agreement should provide for but not be limited to:

a) periodic review of the conservation status of the migratory species concerned and the identification of the factors which may be harmful to that status;
b) co-ordinated conservation and management plans;
c) research into the ecology and population dynamics of the migratory species concerned, with special regard to migration;
d) the exchange of information on the migratory species concerned, special regard being paid to the exchange of the results of research and of relevant statistics;
e) conservation and, where required and feasible, restoration of the habitats of importance in maintaining a favourable conservation status, and protection of such habitats from disturbances, including strict control of the introduction of, or control of already introduced, exotic species detrimental to the migratory species;
f) maintenance of a network of suitable habitats appropriately disposed in relation to the migration routes;
g) where it appears desirable, the provision of new habitats favourable to the migratory species or reintroduction of the migratory species into favourable habitats;
h) elimination of, to the maximum extent possible, or compensation for activities and obstacles which hinder or impede migration;
i) prevention, reduction or control of the release into the habitat of the migratory species of substances harmful to that migratory species;
j) measures based on sound ecological principles to control and manage the taking of the migratory species;
k) procedures for co-ordinating action to suppress illegal taking;
l) exchange of information on substantial threats to the migratory species;
m) emergency procedures whereby conservation action would be considerably and rapidly strengthened when the conservation status of the migratory species is seriously affected; and
n) making the general public aware of the contents and aims of the Agreement.

Article VI
Range States

1. A list of the Range States of migratory species listed in Appendices I and II shall be kept up to date by the Secretariat using information it has received from the Parties.

2. The Parties shall keep the Secretariat informed in regard to which of the migratory species listed in Appendices I and II they consider themselves to be Range States, including provision of information on their flag vessels engaged outside national jurisdictional limits in taking the migratory species concerned and, where possible, future plans in respect of such taking.

3. The Parties which are Range States for migratory species listed in Appendix I or Appendix II should inform the Conference of the Parties through the Secretariat, at least six months prior to each ordinary meeting of the Conference, on measures that they are taking to implement the provisions of this Convention for these species.

Article VII
The Conference of the Parties

1. The Conference of the Parties shall be the decision-making organ of this Convention.

2. The Secretariat shall call a meeting of the Conference of the Parties not later than two years after the entry into force of this Convention.

3. Thereafter the Secretariat shall convene ordinary meetings of the Conference of the Parties at intervals of not more than three years, unless the Conference decides otherwise, and extraordinary meetings at any time on the written request of at least one-third of the Parties.
4. The Conference of the Parties shall establish and keep under review the financial regulations of this Convention. The Conference of the Parties shall, at each of its ordinary meetings, adopt the budget for the next financial period. Each Party shall contribute to this budget according to a scale to be agreed upon by the Conference. Financial regulations, including the provisions on the budget and the scale of contributions as well as their modifications, shall be adopted by unanimous vote of the Parties present and voting.

5. At each of its meetings the Conference of the Parties shall review the implementation of this Convention and may in particular:

a) review and assess the conservation status of migratory species;
b) review the progress made towards the conservation of migratory species, especially those listed in Appendices I and II;
c) make such provision and provide such guidance as may be necessary to enable the Scientific Council and the Secretariat to carry out their duties;
d) receive and consider any reports presented by the Scientific Council, the Secretariat, any Party or any standing body established pursuant to an Agreement;
e) make recommendations to the Parties for improving the conservation status of migratory species and review the progress being made under Agreements;
f) in those cases where an Agreement has not been concluded, make recommendations for the convening of meetings of the Parties that are Range States of a migratory species or group of migratory species to discuss measures to improve the conservation status of the species;
g) make recommendations to the Parties for improving the effectiveness of this Convention; and
h) decide on any additional measure that should be taken to implement the objectives of this Convention.

6. Each meeting of the Conference of the Parties should determine the time and venue of the next meeting.

7. Any meeting of the Conference of the Parties shall determine and adopt rules of procedure for that meeting. Decisions at a meeting of the Conference of the Parties shall require a two-thirds majority of the Parties present and voting, except where otherwise provided for by this Convention.

8. The United Nations, its Specialized Agencies, the International Atomic Energy Agency, as well as any State not a party to this Convention and, for each Agreement, the body designated by the parties to that Agreement, may be represented by observers at meetings of the Conference of the Parties.

9. Any agency or body technically qualified in protection, conservation and management of migratory species, in the following categories, which has informed the Secretariat of its desire to be represented at meetings of the Conference of the Parties by observers, shall be admitted unless at least one-third of the Parties present object:

a) international agencies or bodies, either governmental or non-governmental, and national governmental agencies and bodies; and
b) national non-governmental agencies or bodies which have been approved for

this purpose by the State in which they are located.
Once admitted, these observers shall have the right to participate but not to vote.

Article VIII
The Scientific Council

1. At its first meeting, the Conference of the Parties shall establish a Scientific Council to provide advice on scientific matters.

2. Any Party may appoint a qualified expert as a member of the Scientific Council. In addition, the Scientific Council shall include as members qualified experts selected and appointed by the Conference of the Parties; the number of these experts, the criteria for their selection and the terms of their appointments shall be as determined by the Conference of the Parties.

3. The Scientific Council shall meet at the request of the Secretariat as required by the Conference of the Parties.

4. Subject to the approval of the Conference of the Parties, the Scientific Council shall establish its own rules of procedure.

5. The Conference of the Parties shall determine the functions of the Scientific Council, which may include:

a) providing scientific advice to the Conference of the Parties, to the Secretariat, and, if approved by the Conference of the Parties, to any body set up under this Convention or an Agreement or to any Party;
b) recommending research and the co-ordination of research on migratory species, evaluating the results of such research in order to ascertain the conservation status of migratory species and reporting to the Conference of the Parties on such status and measures for its improvement;
c) making recommendations to the Conference of the Parties as to the migratory species to be included in Appendices I and II, together with an indication of the range of such migratory species;
d) making recommendations to the Conference of the Parties as to specific conservation and management measures to be included in Agreements on migratory species; and
e) recommending to the Conference of the Parties solutions to problems relating to the scientific aspects of the implementation of this Convention, in particular with regard to the habitats of migratory species.

Article IX
The Secretariat

1. For the purposes of this Convention a Secretariat shall be established.

2. Upon entry into force of this Convention, the Secretariat is provided by the Executive Director of the United Nations Environment Programme. To the extent and in the manner he considers appropriate, he may be assisted by suitable intergovernmental or non-governmental, international or national agencies and bodies technically qualified in protection, conservation and management of wild animals.

3. If the United Nations Environment Programme is no longer able to provide the Secretariat, the Conference of the Parties shall make alternative arrangements for the Secretariat.

4. The functions of the Secretariat shall be:

a) to arrange for and service meetings: (i) of the Conference of the Parties, and (ii) of the Scientific Council;
b) to maintain liaison with and promote liaison between the Parties, the standing bodies set up under Agreements and other international organizations concerned with migratory species;
c) to obtain from any appropriate source reports and other information which will further the objectives and implementation of this Convention and to arrange for the appropriate dissemination of such information;
d) to invite the attention of the Conference of the Parties to any matter pertaining to the objectives of this Convention;
e) to prepare for the Conference of the Parties reports on the work of the Secretariat and on the implementation of this Convention;
f) to maintain and publish a list of Range States of all migratory species included in Appendices I and II;
g) to promote, under the direction of the Conference of the Parties, the conclusion of Agreements,
h) to maintain and make available to the Parties a list of Agreements and, if so required by the Conference of the Parties, to provide any information on such Agreements;
i) to maintain and publish a list of the recommendations made by the Conference of the Parties pursuant to sub-paragraphs (e), (f) and (g) of paragraph 5 of Article VII or of decisions made pursuant to sub-paragraph (h) of that paragraph;
j) to provide for the general public information concerning this Convention and its objectives; and
k) to perform any other function entrusted to it under this Convention or by the Conference of the Parties.

Article X
Amendment of the Convention

1. This Convention may be amended at any ordinary or extraordinary meeting of the Conference of the Parties.

2. Proposals for amendment may be made by any Party.

3. The text of any proposed amendment and the reasons for it shall be communicated to the Secretary at least one hundred and fifty days before the meeting at which it is to be considered and shall promptly be communicated by the Secretary to all Parties. Any comments on the text by the Parties shall be communicated to the Secretariat not less than sixty days before the meeting begins. The Secretariat shall, immediately after the last day for submission of comments, communicate to the Parties all comments submitted by that day.

4. Amendments shall be adopted by a two-thirds majority of Parties present and voting.

5. An amendment adopted shall enter into force for all Parties which have accepted it on the first day of the third month following the date on which two-thirds of the Parties have deposited an instrument of acceptance with the Depositary. For each Party which deposits an instrument of acceptance after the date on which two-thirds of the Parties have deposited an instrument of acceptance, the amendment shall enter into force for that Party on the first day of the third month following the deposit of its instrument of acceptance.

Article XI
Amendment of the Appendices

1. Appendices I and II may be amended at any ordinary or extraordinary meeting of the Conference of the Parties.

2. Proposals for amendment may be made by any Party.

3. The text of any proposed amendment and the reasons for it, based on the best scientific evidence available, shall be communicated to the Secretariat at least one hundred and fifty days before the meeting and shall promptly be communicated by the Secretariat to all Parties. Any comments on the text by the Parties shall be communicated to the Secretariat not less than sixty days before the meeting begins. The Secretariat shall, immediately after the last day for submission of comments, communicate to the Parties all comments submitted by that day.

4. Amendments shall be adopted by a two-thirds majority of Parties present and voting.
5. An amendment to the Appendices shall enter into force for all Parties ninety days after the meeting of the Conference of the Parties at which it was adopted, except for those Parties which make a reservation in accordance with paragraph 6 of this Article.

6. During the period of ninety days provided for in paragraph 5 of this Article, any Party may by notification in writing to the Depositary make a reservation with respect to the amendment. A reservation to an amendment may be withdrawn by written notification to the Depositary and thereupon the amendment shall enter into force for that Party ninety days after the reservation is withdrawn.

Article XII
Effect on International Conventions and Other Legislation

1. Nothing in this Convention shall prejudice the codification and development of the law of the sea by the United Nations Conference on the Law of the Sea convened pursuant to Resolution 2750 C (XXV) of the General Assembly of the United Nations nor the present or future claims and legal views of any State concerning the law of the sea and the nature and extent of coastal and flag State jurisdiction.

2. The provisions of this Convention shall in no way affect the rights or obligations of any Party deriving from any existing treaty, convention or Agreement.

3. The provisions of this Convention shall in no way affect the right of Parties to adopt stricter domestic measures concerning the conservation of migratory species listed in Appendices I and II or to adopt domestic measures concerning the conservation of species not listed in Appendices I and II.

Article XIII
Settlement of Disputes

1. Any dispute which may arise between two or more Parties with respect to the interpretation or application of the provisions of this Convention shall be subject to negotiation between the Parties involved in the dispute.

2. If the dispute cannot be resolved in accordance with paragraph 1 of this Article, the Parties may, by mutual consent, submit the dispute to arbitration, in particular that of the Permanent Court of Arbitration at The Hague, and the Parties submitting the dispute shall be bound by the arbitral decision.

Article XIV
Reservations

1. The provisions of this Convention shall not be subject to general reservations. Specific reservations may be entered in accordance with the provisions of this Article and Article XI.

2. Any State or regional economic integration organization may, on depositing its instrument of ratification, acceptance, approval or accession, enter a specific reservation with regard to the presence on either Appendix I or Appendix II or both, of any migratory species and shall then not be regarded as a Party in regard to the subject of that reservation until ninety days after the Depositary has transmitted to the Parties notification that such reservation has been withdrawn.

Article XV
Signature

This Convention shall be open for signature at Bonn for all States and any regional economic integration organization until the twenty-second day of June, 1980.

Article XVI
Ratification, Acceptance, Approval

This Convention shall be subject to ratification, acceptance or approval. Instruments of ratification, acceptance or approval shall be deposited with the Government of the Federal Republic of Germany, which shall be the Depositary.

Article XVII
Accession

After the twenty-second day of June 1980 this Convention shall be open for accession by all non-signatory States and any regional economic integration organization. Instruments of accession shall be deposited with the Depositary.

Article XVIII
Entry into Force

1. This Convention shall enter into force on the first day of the third month following the date of deposit of the fifteenth instrument of ratification, acceptance, approval or accession with the Depositary.

2. For each State or each regional economic integration organization which ratifies, accepts or approves this Convention or accedes thereto after the deposit of the fifteenth instrument of ratification, acceptance, approval or accession, this Convention shall enter into force on the first day of the third month following the deposit by such State or such organization of its instrument of ratification, acceptance, approval or accession.

Article XIX
Denunciation

Any Party may denounce this Convention by written notification to the Depositary at any time. The denunciation shall take effect twelve months after the Depositary has received the notification.

Article XX
Depositary

1. The original of this Convention, in the English, French, German, Russian and Spanish languages, each version being equally authentic, shall be deposited with the Depositary. The Depositary shall transmit certified copies of each of these versions to all States and all regional economic integration organizations that have signed the Convention or deposited instruments of accession to it.

2. The Depositary shall, after consultation with the Governments concerned, prepare official versions of the text of this Convention in the Arabic and Chinese languages.

3. The Depositary shall inform all signatory and acceding States and all signatory and acceding regional economic integration organizations and the Secretariat of signatures, deposit of instruments of ratification, acceptance, approval or accession, entry into force of this Convention, amendments thereto, specific reservations and notifications of denunciation.

4. As soon as this Convention enters into force, a certified copy thereof shall be transmitted by the Depositary to the Secretariat of the United Nations for registration and publication in accordance with Article 102 of the Charter of the United Nations. In witness whereof the undersigned, being duly authorized to that effect, have signed this Convention.

Done at Bonn on 23 June 1979.

ANNEX XXXIV

RECOMMENDATIONS TO MoP2

ANNEX XXXIVa

ACCOBAMS

Recommendation 2.1: Guidelines for the use of acoustic deterrent devices – a way forward

The ACCOBAMS SC1 (recommendation 1.1) had expressed concern over the unregulated deployment of acoustic alarms, urging caution in deployment until controlled studies have been conducted and they have been shown to be both effective in reducing competitive interactions between dolphins and fisheries, and not harmful to the conservation status of cetacean populations.

Given: (1) that such controlled studies have not yet taken place; (2) the existence of competitive interactions between dolphins and fisheries within the ACCOBAMS area; (3) the commercial marketing of such devices; (4) the wide uncontrolled use of acoustic deterrent devices (ADDs) in some countries; and (5) requests for advice on their use received by the Secretariat from the authorities of several riparian Countries, the Scientific Committee recognises that it must take an immediate initiative in developing guidelines and advice for the use of ADDs.

The Committee recognises that despite the obvious need, it is not in a position at present to propose such guidelines and advice at this meeting. Noting that an expert workshop on the problems of conflicts between dolphins and Mediterranean coastal fisheries was held at ICRAM from 4-5 May 2001 (Reeves *et al.* 2001), the Committee agrees that the most efficient way to proceed is to hold a workshop of no more than five experts before February 2004, to develop at least interim guidelines for consideration and adoption by the Committee as soon as possible. The workshop should base its work on the conclusions and recommendations of the ICRAM workshop.

Terms of reference for the workshop:

The workshop will focus only on the competitive interactions between dolphins and fisheries, not on questions related to bycatches. The Scientific Committee agreed that the primary aim of the workshop will be to develop a risk assessment framework in order to provide practical guidelines for the use of ADDs and/or other mitigation measures that will be of immediate use to ACCOBAMS parties and riparian countries. It may also provide recommendations for future work that will enable refinement of any proposed guidelines.

In developing such guidelines, the workshop will consider to the extent possible:

(1) an evaluation of likely and possible impacts of ADDs on cetaceans at the individual and population level;
(2) an evaluation of the effectiveness of acoustic deterrents in reducing harmful interactions between dolphins and fisheries in specific cases;
(3) identification of the work required to reduce the most important uncertainties in the provision of advice on the effectiveness and potential impacts on cetaceans of the use of such devices;
(4) the identification of potential alternatives to acoustic devices for reducing conflicts between dolphins and fisheries.

ANNEX XXXIVb

ACCOBAMS

Recommendation 2.2: Pelagic gillnets in the ACCOBAMS Area

Traditional or modified pelagic gillnets, whether drifting or not, are known to represent a major source of incidental mortality for cetaceans. The Scientific Committee is greatly concerned that such gear is still being widely used in the Agreement Area, notably in the southern Tyrrhenian Sea, Ligurian Sea and Provençal Basin, in contrast to mainstream international and national legislation. This is resulting in significant cetacean mortality in the Agreement Area (e.g., SC2/Inf 17), even in marine protected areas specially established for cetaceans.

Therefore, the Scientific Committee urges the Parties of ACCOBAMS to:

- ensure that their fishing operations are conducted in full accordance with the relevant existing regulations aimed at the mitigation of cetacean bycatch;
- ensure that their fishing effort, including pelagic drifting and non-drifting gillnets, be reported to the ACCOBAMS Secretariat, as stated in Resolution 1.8 of the First Meeting of the ACCOBAMS Parties (Monaco, 2002);
- invite Riparian States to join the effort of the ACCOBAMS Parties in preventing further cetacean mortality in the Agreement Area, and to provide relevant information on fishing gear, particularly driftnets, and effort to FAO.

ANNEX XXXIVc

ACCOBAMS

Recommendation 2.3: Relationship between ACCOBAMS and the PELAGOS Sanctuary

The Scientific Committee of ACCOBAMS recognises the common aims of ACCOBAMS and the PELAGOS Sanctuary with respect to the conservation of cetaceans in the area. It recommends that the Secretariat explore how best to ensure that appropriate co-operation occurs between ACCOBAMS and the PELAGOS Sanctuary for the benefit of cetacean conservation. This should include the exchange of information, expertise and observers at each other's meetings, with the aim of developing co-operative research projects that ensure the most efficient use of resources.

ANNEX XXXIVd

Recommendation 2.4: The Conservation Plan for Cetaceans in the Black Sea

The preparation of a Conservation Plan for cetaceans in the Black Sea is one of the priorities (Action 6) adopted by the ACCOBAMS First Meeting of the Parties. A draft concept paper for the initial project proposal, formulated as a "GEF medium-sized" project in close cooperation with all the Black Sea States, was supported by the ACCOBAMS First Meeting of the Parties (Monaco, 2002), by the ACCOBAMS First Meeting of the Scientific Committee (Tunis, 2002), and by the meeting of the Black Sea Commission's Advisory Group on the Conservation of Biological Diversity (Istanbul, 2002).
Therefore, a final project proposal is in the process of being submitted to the GEF operational focal points.
In consideration of the increasing urgency that a Conservation Plan for cetaceans in the Black Sea be finalised and implemented, particularly due to concern for the deteriorating conservation status of Black Sea harbour porpoises, the Scientific Committee **strongly recommends** :

- that the ACCOBAMS Parties invite all Black Sea States to endorse the proposal, provide to it all necessary support, and seek the assistance of the Black Sea Commission in the negotiation process with GEF;
- that other possible funding sources be explored as a matter of urgency to increase the chances that activities can be implemented in useful time.

ANNEX XXXIVe

Recommendation 2.5 : Fin whale workshop

The Scientific Committee has identified a number of important research and management needs for fin whales in the ACCOBAMS area (CS2/Doc 14). Many of these are also of relevance to work in the PELAGOS Sanctuary. In accordance with the recommendation on co-operation between ACCOBAMS and the PELAGOS Sanctuary, the Scientific Committee recommends the holding of a joint workshop on fin whale research and management involving relevant fin whale experts from the region. This recommendation is also relevant to that on ship collisions.

Terms of reference for the workshop:

The primary aim of the workshop will be to gather together all experts involved in fin whale research in the ACCOBAMS area to develop a co-ordinated research plan to address the actions identified in CS2/Doc. 14. It is hoped that this will result in avoidance of any duplication of effort and the development of agreed methods of data collection and analysis to provide information to allow the determination of appropriate management actions and the monitoring of their success. An important component of the Workshop will be to develop a framework for the sharing of existing and future datasets amongst scientists in the region that is required for the conservation of the species.

The Scientific Committee recommends the establishment of a joint steering group to develop a detailed agenda and practical arrangements for the workshop. Membership of the Steering Group should be determined by the Chair of the ACCOBAMS Scientific Committee and a representative of the PELAGOS Sanctuary.

ANNEX XXXIVf

ACCOBAMS

Recommendation 2.6: National stranding networks

Information from strandings is of great importance to several aspects of the Committee's work. The Committee notes that efficient strandings networks only exist in a few countries within the ACCOBAMS area. It therefore urges the Parties (1) to develop appropriate networks where they do not exist and (2) to encourage riparian states to do the same. The Committee is willing to assist in such work by providing advice on protocols, capacity building and the use of the MEDACES strandings database.

ANNEX XXXIVg

ACCOBAMS

Recommendation 2.7: Man made noise

Introduction

There have been several recent reviews of the potential negative effect of anthropogenic noise on cetaceans (e.g., Richardson et al. 1995. Marine mammals and noise. Academic Press; Würsig and Richardson 2002. Noise, effects of. Encyclopaedia of Marine Mammals. Academic Press; Ocean Studies Board 2003. Ocean noise and marine mammals. The National Academies Press). In almost all cases up to now, there are insufficient data to evaluate the nature and scale of such possible effects. One of the first suggested direct correlations arose from an unusual mass stranding of beaked whales (*Ziphius cavirostris*) in Greek waters (Frantzis, 1998, *Nature* 392:24) where the deaths were thought to be linked to a NATO sonar experiment, although the general possibility of a link between beaked whale strandings and military activity had been raised earlier (e.g. Simmonds and Lopez-Jurado, 1991, *Nature* 351:448). Subsequently, there have been three similar multiple mass strandings of this species associated with military sonar (US Navy, Bahamas, March 2000; NATO, Madeira, May 2000 and Spanish Navy, Canary Islands, 2002). There is now general acceptance that these deaths were the result of the military sonar activities (e.g. Jepson *et al.,* 2003, *Nature* 425:576-577). Of course, it is recognised that there are many potential causes of mass strandings of cetaceans that are not associated with anthropogenic noise.

Although mass strandings may appear to represent the most critical class of incidents concerning the effect of sound on cetaceans, it should be remembered that anthropogenic noise (overwhelmingly from shipping) has been increasing in the oceans (especially in the Northern Hemisphere) since the industrial revolution, especially in recent decades. Whilst there is little evidence to suggest that this generally has an acute effect (e.g. mass strandings), the chronic effects of increased noise levels and loud point sources (ships, explosives, constructions etc.) are generally unknown but may potentially have significant effects at the population level. Fundamental research is needed to address this very complex question and a number of new techniques have become available to begin to address this issue (e.g., SC2/Inf 13 by Peter Tyack).

Research recommendations

In order to address questions related to the possible effects of anthropogenic noise on cetaceans in the ACCOBAMS area, a number of research projects need to be initiated. The Committee recommends that these include:

(1) A collaborative and co-ordinated temporal and geographic mapping of local ambient noise (both anthropogenic and biological noise) coupled with similar mapping of the distribution and abundance of cetaceans within the agreement area; this will provide the essential baseline information to allow identification of potential areas/times of highest risk and the beginning of an evaluation of the possible relationship between abundance and distribution and noise levels.

(2) Compilation of a reference signature database that is made publicly available, to assist in identifying the source of potentially damaging sounds (in conjunction with the mapping exercise above);

(3) Assessing the potential acoustic risk for individual target species from consideration of their acoustic capabilities and characteristics;

(4) The carrying out of targeted, well-defined experiments to identify and quantify the actual and potential risk for individual species (including particularly vulnerable classes of animals such as calves), with a view *inter alia* to refine and test existing guidelines on the use of noise in the context of cetaceans (e.g. seismic exploration and other specific human activities that involve underwater sound) and where appropriate, develop new guidelines.

In making recommendation (4), the Committee recognises that this may entail some intentional harassment of cetaceans, noting that agreement text allows for 'special derogation granted for scientific research after advice from the Scientific Committee'. The Committee believes that such research is essential but that any such proposals must be reviewed carefully. It notes that specific guidelines exist before such research can be carried out in some countries (e.g. USA). It recommends that the ACCOBAMS Scientific Committee (supplemented as necessary by appropriate experts):

(1) acts as a review body for applications for such research in the ACCOBAMS area;
(2) develops a *pro forma* for such applications (which will *inter alia* consider any existing processes elsewhere in the world and the need within the ACCOBAMS agreement for an EIA);
(3) Reviews the results of such work within a specified timeframe.

Specific management recommendations

Despite the overall lack of knowledge of the impact of the many kinds of anthropogenic noise on the conservation status of most cetacean species, the Scientific Committee recognises that there is already sufficient knowledge gathered to say that there is a significant acute impact of a specific man-made sound (high level sound produced by operating military sonar) on beaked whales, particularly *Ziphius cavirostris*, in the Agreement area (Jepson *et al.,* 2003, *Nature* 425:576-577). The Committee also recognises the recent work undertaken by NATO in this regard (e.g., Carron, Marine Mammal Acoustic Risk Mitigation, Project 04F-1) and the caution which is used before sanctioning the use of such sonar in NATO experimental exercises. Given our lack of understanding of the conservation status and distribution of this species in the region, it believes that in accord with the precautionary principle, such caution should be regarded as the minimum necessary.

The Committee recognises that at present, there are no mitigation measures that can guarantee to eliminate completely the risks posed by such military sonar to this species, other than a complete ban on their use.

The Committee notes that there is at least one (NATO) and probably more protocols/guidelines developed by military authorities with respect to use of such sonar in the context of threats to cetaceans. It recommends that ACCOBAMS parties urge that such guidelines and the information upon which they are based (including data and distribution models) be made available to the ACCOBAMS Scientific Committee as soon as possible for review, with a view to developing common sets of guidelines for use in the ACCOBAMS area.

In the meantime, the Committee recommends that the ACCOBAMS parties consult with any profession using such acoustic devices, including military authorities, and urge that extreme caution be exercised in their use in the ACCOBAMS area, with the ideal being no further use until satisfactory guidelines are developed.

In making this recommendation, the Scientific Committee is not implying that military sonar represents the most important threat related to anthropogenic noise and cetaceans in the ACCOBAMS area. Rather it reflects the fact that the cause-effect link in this situation is best understood at present.

Guidelines also exist in some countries for the use of other sonic devices (e.g. seismic exploration). In particular in connection with research recommendation (4) above, the Committee also recommends that ACCOBAMS parties submit such guidelines for its review.

ANNEX XXXIVh

ACCOBAMS

Recommendation 2.8 : Ship collisions

The Scientific Committee has recognised the potential threat of ship collisions to the conservation of some cetacean populations in the ACCOBAMS area, especially of large whales (e.g. CS2/Doc.23). The two species most vulnerable within the area are the fin whale and the sperm whale. This potential threat has been exacerbated by the increase in vessel traffic, including fast ferries, over recent years, throughout the area including within existing sanctuary areas (e.g. the PELAGOS sanctuary). The Committee's recommendations under this topic fall under two headings: assessment of impact at the population level and development of mitigation measures. This work can and should continue in parallel. Matters relating to the fin whale are also relevant to discussions under Recommendation 2.5 (on a fin whale workshop).

<u>Determination of the impact of ship collisions on the most vulnerable populations:</u>
Understanding the potential impact of ship collisions requires knowledge of (1) the number of mortalities and (2) the size of the affected populations. With respect to (1) the Committee urges Parties and encourages riparian nations to improve reporting of ship strikes. It also recognises the importance of evidence from both post-mortem information from strandings networks and the ACCOBAMS central database (see Item 4.1.18) and photo-identification studies (photographs may contain evidence of non-lethal encounters with vessels) in this regard and encourages work in this area. With respect to (2) the Committee refers to its recommendation on the importance of baseline information on abundance and distribution (Recommendation 2.9), noting also that for fin whales this forms part of the work of the fin whale workshop (Recommendation 2.5) and for sperm whales it is an important objective of the planned sperm whale cruise (see Item 4.1.11). The potential monitoring value of observations from vessels following regular routes (e.g. ferries) should be investigated further.

<u>Development of effective mitigation measures:</u>
Whilst determination of the impact on cetaceans at the population level helps to clarify the priority that mitigation against ship strikes might have in any overall conservation plan, it is in both the interests of cetaceans and shipping companies that ship strikes be minimised towards zero. This will require research (initially focussing on fin and sperm whales) at a number of related levels and should include consideration of existing research and management actions from outside the ACCOBAMS area (e.g. with respect to the North Atlantic right whale):

(1) mapping the temporal and geographic distribution and abundance of cetaceans (see above) in relationship to similar information on vessel traffic – Parties and riparian states are encouraged to assist in the provision of relevant information on shipping routes and frequencies;
(2) behavioural and physiological research (including controlled exposure experiments) into the reasons some cetaceans do not avoid collisions with vessels;
(3) examination of methods that might be used by vessel personnel and ship designers to avoid collisions.

The Committee notes that such work would be facilitated by the holding of a workshop. This could most efficiently be held in the context (e.g. immediately before) the fin whale workshop referred to in Recommendation 2.5.

ANNEX XXXIVi

Recommendation 2.9: The fundamental need for information on abundance and distribution of cetaceans within the area

The Scientific Committee wishes to draw the attention of the ACCOBAMS Parties to the fundamental importance of obtaining baseline population[104] estimates and distributional information of cetaceans within the area as soon as possible. Without such information (and a suitable monitoring programme) it will be impossible to *inter alia* determine whether ACCOBAMS is meeting its conservation objectives. The great importance of such information in the assessment of risk, the determination of appropriate mitigation measures and the associated determination of priority actions, has been highlighted by many discussions at this meeting. The Committee agrees that such work thus represents the highest priority for research within the area (although this should not be interpreted as meaning that other work can not continue in parallel).

In taking this position, the Committee recognises that obtaining such information represents a formidable challenge from both a scientific and financial perspective. Although the proposed sperm whale survey (Item 4.1.11) may provide some information to assist in designing surveys for other species, it will only provide robust abundance estimates for sperm whales. The Committee therefore recommends that work to determine options for obtaining the necessary information on the abundance and distribution of the other cetacean species begins as a matter of urgency. One model that should be investigated is that of the SCANS survey in the North-eastern Atlantic (Hammond *et al.,* 2001) that involved a major one month survey using a number of vessels and aircraft. The scientific advantages and logistical difficulties of a single or small number of synchronous surveys must be considered in an ACCOBAMS context.

Given the overlap in required expertise, the Committee agrees that such work should begin in conjunction with (i.e. immediately after) the workshop to finalise plans for the Mediterranean sperm whale survey. To assist in this process, it agreed that a small group led by A. Cañadas should begin to compile the basic information required to begin to explore options (e.g. total area to be covered, available information to assist in designing survey blocks and stratification, levels of effort required to provide various levels of coverage). It is important that relevant experts in abundance estimation and the organisation of large-scale surveys be invited to the workshop. The Committee also emphasises that such work is accompanied by effort to design suitable long-term monitoring programmes after the baseline abundance estimates have been obtained.

Even without the results of this work, the Committee recognises that the required research will be extremely expensive and require a major collaborative and co-operative effort. It therefore urges Parties to support this initiative and work with the Committee to investigate possible sources of actual and in-kind funding at both the national and international level. In particular, it would be valuable if Parties can provide the necessary resources for thorough initial planning.

[104] Use of the word population here implies obtaining knowledge on stock structure as well as abundance