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Report of the

FAO AD HOC EXPERT ADVISORY PANEL FOR THE ASSESSMENT OF PROPOSALS TO AMEND APPENDICES I AND II OF CITES CONCERNING COMMERCIALLY-EXPLOITED AQUATIC SPECIES

Rome, 13-16 July 2004

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Rome, 13-16 July 2004

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
Rome, 2004

BACKGROUND AND PURPOSE OF THE EXPERT CONSULTATION

1. The FAO ad hoc Expert Advisory Panel for the Assessment of Proposals to Amend Appendices I and II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) Concerning Commercially-Exploited Aquatic Species was held in response to the agreement by the Twenty-fifth Session of the FAO Committee on Fisheries (COFI) on the Terms of Reference for an ad hoc expert advisory panel for assessment of proposals to CITES, and the agreement at the 9th Session of the COFI Sub-Committee on Fish Trade (Bremen, Germany, February 2004) that FAO should convene such a panel to review any proposals to the 13th Conference of the Parties to CITES (CoP-13) for listing or delisting commercially-exploited species in time to be considered at that meeting of the Conference of the Parties.

2. The Terms of Reference agreed to at the 25th Session of COFI are attached to this report as Appendix D. In accordance with those terms of reference, the Panel was established by the FAO Secretariat, according to its standard rules and procedures and observing the principle of equitable geographical representation, drawing from a roster of recognized experts. The task of the Panel was to:

- assess each proposal from a scientific perspective in accordance with the CITES biological listing criteria, taking account of the recommendations on the criteria made to CITES by FAO;

- comment, as appropriate, on technical aspects of the proposal in relation to biology, ecology, trade and management issues, as well as, to the extent possible, the likely effectiveness for conservation.

THE PANEL MEETING

3. The Panel met in Rome, Italy, from 13 to 16 July, hosted by FAO with funding from the FAO Regular Programme and the Governments of Japan, Norway and the United States of America.

4. The Panel consisted of a core group made up of 9 members, five species specialists covering white shark, humphead wrasse and Mediterranean date mussel, and by a member of the CITES Secretariat (see Appendix B). The Agenda adopted for the meeting is included as Appendix A.

5. The meeting was opened by Mr Ichiro Nomura, Assistant Director General, Fisheries Department who welcomed the participants and provided some background to the convening of this first meeting of the ad hoc Advisory Panel and the importance of its task. The text of his statement is reproduced in Appendix C.

6. Mr Arne Bjorge was elected Chair of the Panel and Mr Jean-Jacques Maguire was elected vice-Chair. Ms Pamela Mace and Messrs John Field, Robin Mahon and Howard Powles were elected rapporteurs.

OUTCOME OF THE MEETING

Evaluation of The Proposals

7. The Panel considered the following four proposals

CoP13 Prop. 32. Proposal to include *Carcharodon carcharias* (white shark) on CITES Appendix II, including an annotation that states that a zero annual export quota is established for this species.

CoP13 Prop. 33. Proposal to include *Cheilinus undulatus* (humphead wrasse) in Appendix II in accordance with Article II, paragraph 2(a) of the Convention.

CoP13 Prop. 35. Proposal to include *Lithophaga lithophaga* (Mediterranean date mussel) in Appendix II

CoP13 Prop. 36. Proposal for an amendment of the annotation for Helioporidae spp., Tubiporidae spp., Scleractinia spp., Milleporidae spp. and Stylasteridae spp.

The assessments prepared by the Panel on each of these Proposals are attached to this report as Appendixes E, F, G, and H respectively.

General Comments And Observations

Comments from Member Countries Received by the FAO Secretariat

8. In accordance with the terms of reference for the Panel, FAO Members and regional fishery management organizations were notified of the proposals submitted that dealt with commercially-exploited aquatic species and were informed that FAO would be convening the ad hoc Advisory Panel. They were invited to send any comments or relevant information to the FAO Secretariat, for consideration by the Panel. Five countries responded to this request. As well as providing some information directly relevant to some of the proposals, the responses covered the range of views previously expressed by FAO Members on the role of CITES in relation to commercially-exploited aquatic species. These range from the view that CITES could provide a useful instrument, complementary to traditional fisheries management, in protecting fishery resources from extinction and in promoting their sustainable use, to the opinion that this role could be better taken care of by other instruments.

The Listing Criteria Considered in the Panel Evaluation

9. The criteria relevant to the proposals for an Appendix II listing considered by the Panel are those in Annex 2a in conjunction with the guidelines in Annex 5 of Resolution Conf. 9.24 (Rev. CoP12). However, a revision of this Resolution is currently underway. The draft version of the revision at the time of the Panel meeting (CITES document CoP13 Doc. 57) differs in a number of respects from Res. Conf. 9.24 (Rev. CoP12). Most importantly, for commercially-exploited aquatic species, it includes revisions in the wording of the Annex 2a criteria and the associated Annex 5 decline guidelines, as detailed in the individual assessment reports. Resolution Conf. 9.24 (Rev. CoP12) will be used for the next CoP meeting (CoP13). However, FAO considers the current revision (CoP13 Doc. 57) to be more appropriate for commercially-exploited aquatic species.

General Comments by the Panel on the Proposals

10. The proposals made substantial efforts to provide good information on the population and life history parameters of the species under consideration. However, it is also important for proponents to provide more information on how the parameters and trends reported upon were derived, so that Parties and the Panel are able to assess adequately their accuracy and precision.

11. The Panel noted that there were several instances in the proposals where the proponents appeared not to have given sufficient consideration to the quality of the information to which they referred in their proposals. The Panel frequently examined the original sources of information referenced in the proposals. In these instances it was sometimes found that there were problems in the information available from the original source arising from, for example, inadequacies in the methods used or in the consistency of the data over time. In other cases, the proponents did not use or interpret the information either accurately or comprehensively. The Panel recommended that in the preparation of proposals it is essential that the proponents ensure the validity of any information they cite and that they use it appropriately.

12. It is essential that proposals include not only the best estimates of relevant parameters and measures but also estimates of the uncertainties (e.g. standard errors) in those parameters and measures. This was done in some instances in the proposals but was not always presented as clearly as, or in conjunction with, the best estimates. Any estimated numbers can only be properly interpreted if considered alongside the uncertainty surrounding them and the Panel recommends that this should always be done in proposals.

13. In all three listing proposals, a key uncertainty was the relationship between trends estimated or observed in local populations or aggregations and any trends taking place in the abundance of the species as a whole. The Panel recognized that such information was not readily available but encourages proponents of future proposals to make greater efforts to integrate the local observations in order to estimate the trends in the species as a whole. The Panel, in the limited time available, undertook some such integrations in order to evaluate the proposals.

14. In several cases, the information in the proposals could have been presented in a manner that would have been easier to assimilate and interpret. The Panel encourages the use of figures and graphs, as far as possible, to show time-series of data, for example catches or catch rates, and spatial patterns and trends. Analysis of trends should, as far as possible, be based on appropriate statistical tests and include estimates of confidence intervals or uncertainty. It should be made clear which data have been used to make any trend estimates. Where some data, or information, have been omitted, the reasons for their omission should be stated in order to avoid giving the impression of subjectivity.

15. The comments received by proponents from Range States were found to be very informative when supplied and should be included in all proposals.

For Consideration in Reading the Reports

16. In considering trends in abundance reported in the proposals, the Panel attempted to evaluate the reliability of each source of information. This was done by assigning a score between 0 (no value) and 5 (highly reliable) to each item of information used to demonstrate trends in the white shark and humphead wrasse proposals. The criteria used to assign a score are included in Table 1.

Table 1. Criteria used by the Panel to assign a measure of the reliability of information derived from different sources for use as indices of abundance. A score of 0 indicates that the information was not considered to be reliable and a score of 5 indicates that it was considered to be highly reliable. Any information on abundance allocated a non-zero value was considered to be useful. These scores could be adjusted either up or down in any particular case, depending on the length of the time-series and the amount of information that was available on the sources and methods.

Reliability index of population abundance information	Source of data or information
5	Statistically designed, fishery-independent survey of abundance
4	Consistent and/or standardised catch-per-unit effort data from the fishery
3	Unstandardised catch-per-unit effort data from the fishery; scientifically-designed, structured interviews; well-specified and consistent anecdotal information on major changes from representative samples of stakeholders.
2	Catch or trade data without information on effort
1	Confirmed visual observations; anecdotal impressions
0	Information that does not meet any of the above, or equivalent, criteria; flawed analysis or interpretation of trends

17. The Panel considered that interpretations regarding Precautionary Measures (Annex 4 of Res. Conf. 9.24) involved questions of policy rather than science and hence did not comment on application of precautionary measures in the evaluation of the proposals.

18. The details of references to other publications used in the Panel reports on each proposal can be found in the original proposals, unless otherwise indicated.

ADOPTION OF THE REPORT

19. The report, including all Appendices, was adopted by the ad hoc Advisory Panel on Friday 16 July 2004.

APPENDIX A

Agenda

1. Arrival and registration
2. Welcome by Mr Ichiro Nomura (Assistant Director-General, FAO Fisheries Department)
3. Nomination of Chairperson and vice-Chairperson of the meeting and designation of rapporteurs
4. Adoption of the Agenda
5. Overview of the relevant listing criteria: the FAO Recommendations on listing criteria (FAO Fisheries report No. 667), the CITES draft revised criteria (AC20 DG1 Doc. 1 (Rev.1) and the CITES Res.Conf.9.24 criteria and their application in this evaluation
6. Finalization of the structure and format of the reports on each proposal
7. Preliminary discussion on the four amendment proposals to identify complexity of each proposal and approximate time required for evaluation, additional tasks required, e.g. analyses of data, examination of relevant literature
8. Consideration of proposal on Corals (*Helioporidae* spp., *Tubiporidae* spp., *Scleractinia* spp. and *Stylasteridae* spp.)
9. Consideration of Proposal on white shark (*Carcharodon carcharias*)
10. Consideration of Proposal on humphead wrasse (*Cheilinus undulatus*)
11. Consideration of proposal on Mediterranean date mussel (*Lithophaga lithophaga*)
12. Review of discussion on draft rapporteur's reports
13. Rapporteurs revised reports based on discussions and Secretariat consolidates draft report
14. Plenary discussion
15. Adoption of the report

APPENDIX B

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APPENDIX C

Welcome speech by Mr Ichiro Nomura, Assistant Director-General, FAO Fisheries Department

It is my pleasure to welcome you to this first meeting of the FAO ad hoc Expert Advisory Panel for the Assessment of Proposals to Amend Appendices I and II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) Concerning Commercially-Exploited Aquatic Species.

This is something of an historic occasion and marks the culmination of a lengthy process of deliberation and debate within FAO about its relationship with CITES in relation to commercially-exploited aquatic species and how the Organization could contribute to improved implementation of CITES, where appropriate, for those species.

At the first Technical Consultation on the Suitability of the CITES Criteria for Listing Commercially-exploited Aquatic Species, held in Rome in June 2000, the participating countries agreed not only on the need for FAO to consider possible revisions to the CITES listing criteria for application to commercially-exploited aquatic species but also that:

> "… the FAO Secretariat establish effective mechanisms to contribute to the elaboration and review of the CITES criteria and implementation of Article 15 of the CITES Convention regarding consultation with FAO, member States and regional fishery management organizations (RFMOs) in evaluating proposals for listing against the prevailing criteria."

Article 15 of CITES requires that when CITES receives a proposal to list, down-list or de-list a marine species, they must consult those inter-governmental bodies having a function in relation to those species, in order to obtain any useful scientific data these bodies may be able to provide and to ensure co-ordination with any conservation measures enforced by such bodies. The CITES Secretariat must then communicate the responses received to the Parties prior to the next Conference of the Parties, where a decision on the proposal is made through a vote.

In the past, when CITES have contacted FAO under Article 15, FAO has declined to comment because it had not been given a mandate by its members to do so. At the 25th Session of COFI in 2003, this position changed when COFI agreed on the Terms of Reference for an ad hoc Panel to evaluate the proposals and to advise the FAO Secretariat on the response that should be sent to the CITES Secretariat. This is the first such Panel.

Because this is a pioneering event, and with the differences of opinion between countries on the role of CITES in relation to commercially-exploited aquatic species, you can be sure that the report and conclusions of this Panel meeting will be received with great interest by many countries and NGOs, and will be carefully scrutinised. It is almost certain that you will not be able to please everyone in your conclusions and recommendations. However, that is not your task, and what FAO is asking from you is to use your expertise and experience to undertake

an objective and balanced scientific evaluation of each proposal in accordance with the CITES biological criteria and the FAO recommendations on those criteria. In addition, the Panel is to comment on technical aspects of the proposal in relation to biology, ecology, trade and management issues, as well as, to the extent possible, the likely effectiveness for conservation.

You have been selected, in your individual capacity and not as a representative of any country or organisation, on the basis of your particular expertise to assist FAO to undertake these tasks. I thank you all for giving up your time to help us in this important meeting, especially as I know you are all very busy and some of you have had to rearrange your schedules to be able to attend. I must also thank Mr David Morgan of the CITES Secretariat for joining us at this meeting and for the cooperation and assistance given by CITES in the work we have been undertaking in relation to the Convention and commercially-exploited aquatic species.

Finally, I would like to thank the governments of Japan, Norway and the United States of America for the financial assistance they have provided that has made this meeting of the ad hoc Expert Advisory Panel possible.

I wish you a fruitful and enjoyable meeting.

APPENDIX D

TERMS OF REFERENCE FOR AD HOC EXPERT ADVISORY PANEL FOR ASSESSMENT OF PROPOSALS TO CITES (Taken from Appendix E of the Report of the 25th Session of COFI, FAO, Rome, 24 to 28 February 2003)

1. FAO will establish an ad hoc Expert Advisory Panel for the Assessment of Proposals to Amend CITES Appendices I and II.

2. The Panel shall be established by the FAO Secretariat in advance of each Conference of the Parties, according to its standard rules and procedures and observing, as appropriate, the principle of equitable geographical representation, drawing from a roster of recognized experts, to be established, consisting of scientific and technical specialists in commercially-exploited aquatic species.

3. The Panel members shall participate in the Panel in their personal capacity as experts, and not as representatives of governments or organizations.

4. The Panel will consist of a core group of no more than 10 experts, supplemented for each proposal by up to 10 specialists on the species being considered and aspects of fisheries management relevant to that species.

5. For each proposal the Panel shall:

- assess each proposal from a scientific perspective in accordance with the CITES biological listing criteria, taking account of the recommendations on the criteria made to CITES by FAO;
- comment, as appropriate, on technical aspects of the proposal in relation to biology, ecology, trade and management issues, as well as, to the extent possible, the likely effectiveness for conservation.

6. In preparing its report, the Panel will consider the information contained in the proposal and any additional information received by the specified deadline from FAO Members and relevant RFMOs. In addition, it may ask for comments on any proposed amendment, or any aspect of a proposed amendment, from an expert who is not a member of the Panel if it so decides.

7. The Advisory Panel shall make a report based on its assessment and review, providing information and advice as appropriate on each listing proposal. The Panel shall finalize the advisory report no later than ?? days[1] before the start of the CITES Conference of the Parties where the proposed amendment will be addressed. The advisory report shall be distributed as soon as it is finalized to all members of FAO, and to the CITES Secretariat with a request that they distribute it to all CITES Parties.

[1] To be discussed with the CITES Secretariat

10. The general sequence of events will be as follows:

- Proposals received by CITES
- Proposals forwarded by CITES Secretariat to FAO
- FAO forwards proposals to FAO Members and RFMOs and notifies them of deadline for receipt of comments
- Member and RFMO comments and input received by FAO
- Panel meets and prepares advisory report on each proposal
- Panel report reviewed by FAO Secretariat and forwarded to FAO Members, RFMOs and CITES Secretariat.

APPENDIX E

FAO ad hoc Expert Advisory Panel Assessment Report: White Shark

PROPOSAL No. 32

SPECIES: *Carcharodon carcharias* – White shark

PROPOSAL: Inclusion of *Carcharodon carcharias* (white shark) on CITES Appendix II, including an annotation that states that a zero annual export quota is established for this species.

Basis for proposal: The proposal states that white shark "meets the criteria in Resolution Conf. 9.24 (Rev. CoP12) criteria A and B i) and ii) of Annex 2a (AC19 Doc. 9) because of the significant and ongoing population declines reported in literature and unpublished data."

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ASSESSMENT SUMMARY

The FAO ad hoc Expert Advisory Panel concluded that the historical catches for the Australian and Adriatic components of the population probably could not be continued in perpetuity. There is less certainty about the impacts of current reduced catches in Australia. For South Africa, catches in recent decades appear to be sustainable. For the Northwest Atlantic, sustainability of recent catches is uncertain because of limitations in the data and inappropriate treatment of the data in some of the sources used. The available evidence could support a range of hypotheses, and it was not possible to confirm or exclude the possibility that the species as a whole meets the criteria for listing in Appendix II. The Panel questioned the logic of a zero quota if an Appendix II listing were to be supported by the Parties and agreed that if a species does not qualify for an Appendix I listing, it seemed inappropriate to have a zero quota simultaneously imposed by the Conference of the Parties. There was insufficient information provided in the proposal for the Panel to develop an informed opinion about the relative importance of international trade to the conservation status of white shark.

PANEL COMMENTS

Biological Parameters

Biological parameters for white shark are summarised in Table 1 of the proposal. The Panel noted that it would have been helpful if the proposal had detailed how the population parameters were derived. Since this was not the case, the Panel examined a number of background papers that provided the basis for the summary and noted that many of the parameters were derived from others, rather than being calculated independently. In particular, the estimates of natural mortality and intrinsic rate of natural increase were derived from von Bertalanffy growth parameters which, in turn, were estimated from sparse data

(Smith *et al*. 1998). In addition, the estimates of litter size in Table 1 were based on a sample size of 10 females. Thus, a high level of uncertainty is associated with the parameter estimates. Mollet and Cailliet (2002) provide a much more detailed demographic analysis for the white shark, but this is also constrained by the same limitations in terms of the availability of appropriate data. The Panel concluded that the proponents description of these parameters was perhaps the best that could be obtained with the limited data available.

The Panel also noted that the variable referred to as the "intrinsic rate of natural increase" (the population growth rate at low population size, normally abbreviated *r*) in Table 1 is actually r_{MSY} (the population growth rate at the biomass corresponding to maximum sustainable yield). The value of r_{MSY} is about half as large as the usual interpretation of *r*. It also appears that this parameter may have been calculated (by Smith *et al*. 1998) without taking several important factors into account; in particular, the reproductive periodicity of 2-3 years.

Despite these anomalies, some of which would result in higher estimates of productivity and some of which would result in lower estimates, the Panel concluded that white shark is likely to fit the FAO profile for a low productivity marine species.

Distribution and Habitat Availability

The information on white shark movements and residence patterns is sparse, yet it is important for estimating the portion of the global population or populations that have been adversely affected by exploitation. The Panel discussed this issue at length and concluded that "residence" periods for white sharks are probably short–term (e.g. 2-4 months), and that there is little evidence that individuals reside permanently in specific locations. On the other hand, there is good evidence that individuals return seasonally or more regularly to particular locations, resulting in predictable areas of concentration that can be exploited by commercial and recreational fisheries.

Information on stock structure is weak to non-existent. However, there are at least six major centres of current or historical abundance: the Mediterranean Sea, Northwest Atlantic, Southern Africa, Australasia, the Japanese Archipelago and adjacent areas, and the Northeast Pacific (California–Northern Mexico). There may also be another centre of abundance off the Chilean coast. Figure E.1 shows the recorded distribution of white sharks with the main centres of abundance indicated by black ovals. The Panel considered that this figure adds useful additional information that complements the corresponding figure in the white shark proposal.

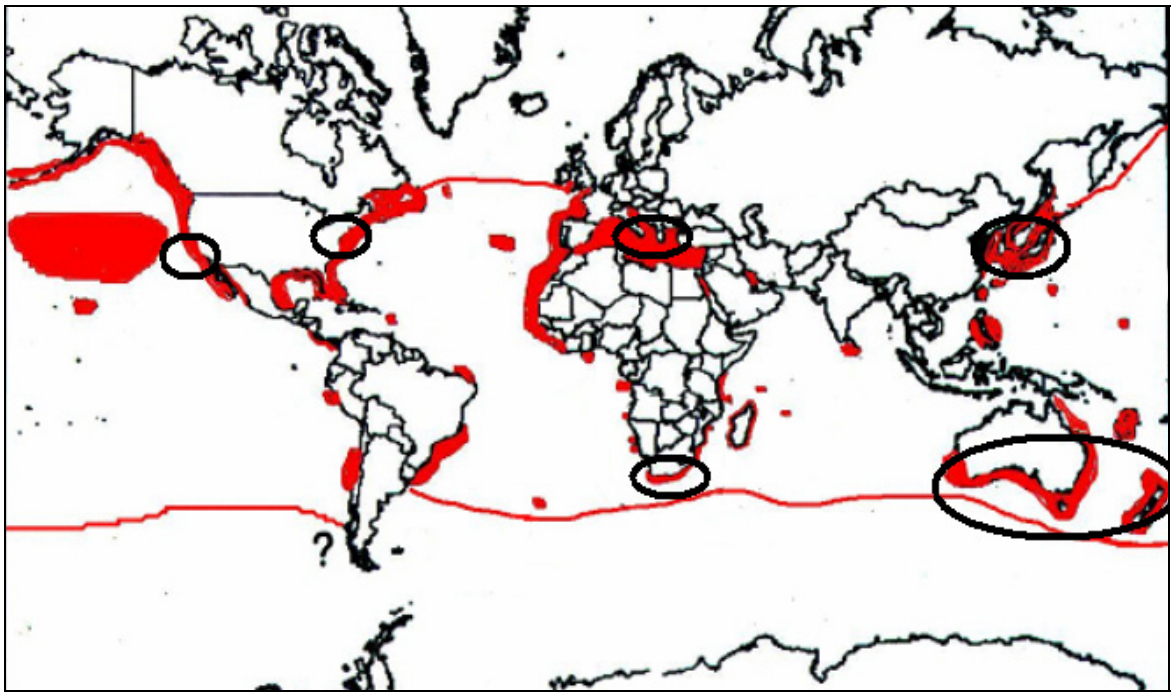

Figure E.1. Unpublished world map of the distribution and centres of abundance of white shark (derived from Compagno in preparation[2]). See Annex 1 for more information.

Population Status and Trends

The white shark proposal contained two estimates of absolute abundance. The Panel was of the opinion that neither of these estimates provided useful information about global population size, and may also have limited utility as estimates of local population size.

The interpretation of the estimate of 1279 individuals (from Cliff *et al*. 1996) as an estimate of absolute abundance for white sharks off southern Africa is not well substantiated. Tagging involved juveniles only; therefore, the estimate does not index the entire population. Results also suggest high rates of emigration from the indexed population. Only 73 individuals were tagged (over five years) and only six recaptures were included in the analysis.

The other estimate of absolute population size (200 white sharks at Dangerous Reef in South Australia; Strong *et al*. 1996) also appeared to apply only to a local aggregation or part of a population, and is therefore of limited usefulness for determining the size of the regional or global population.

The Panel considered one other estimate of absolute abundance that was not included in the supporting statement for the white shark proposal. This estimate was derived from a deterministic model that used available data and current catch to estimate the minimum Australian population size of female white sharks (age 1 and above) that could support current catches (assuming that these are sustainable). Thompson (in Malcolm *et al*. 2001)

[2] Compagno, L.J.V. in preparation. Natural History of the White Shark (*Carcharodon carcharias*).

estimated this minimum population size to be within the range of 2,728–13,746 female white sharks. This estimate may provide a global minimum, but the relationship of such a minimum to the true global population size cannot be inferred due to a lack of information on stock structure and interchange.

Recapture rates recorded in the proposal appear to be high (e.g. 4-6% for South Australia) and could be indicative of small overall population sizes. However, the Panel was not convinced that these were pertinent to whole populations, rather than small temporary local aggregations to which individuals may exhibit some degree of site fidelity, returning on a seasonal or annual basis.

Population trends are summarised in Table 2 of the white shark proposal. Although mostly based on localized time-series, estimates of population trend are presented for four of the six centres of abundance denoted in Figure E.1. The Panel commended the proponents for tabulating the trend data because this provides readers with a useful summary of the more detailed descriptions in the text. However, in many cases, it is unclear how the quantitative estimates of decline were derived, and the Panel concluded that these estimates sometimes did not reflect the data plotted in the figures in the proposal. More detailed comments on each row of Table 2 of the proposal follow.

Row 1 (Northwest Atlantic): The Panel noted that the data for the Northwest Atlantic (Figure 2 of the proposal; from Baum *et al*. 2003) appeared to represent two different time-series with a breakpoint around 1993-94, possibly representing a change in management or fishing practices. In fact, the Panel learned that the first United States Atlantic Shark Management Plan, which came into effect in 1993, contained new reporting requirements that can explain the breakpoint in the time-series (Karyl Brewster–Geisz, National Marine Fisheries Service, pers. comm.). Prior to 1993, fishers in the directed shark fishery could report shark landings in the pelagic longline logbook, along with other longline fishers who targeted tunas or swordfish and took sharks as bycatch. Subsequent to 1993, many fishers switched and began reporting shark catches in the directed shark fishery in a new logbook designed specifically for sharks, and no longer used the pelagic longline logbook. Some fishermen continued to use the pelagic longline logbook but those fishermen were not targeting sharks. The pelagic longline logbook was the basis for the analysis reported by Baum et. al. 2003. This change in reporting practices probably led to substantial reductions in the estimates of catches and catch rates derived from the pelagic longline logbooks alone because fishers in the directed shark fishery are more likely to catch white sharks than those fishermen targeting swordfish or tunas (Karyl Brewster–Geisz, pers. comm.). The Panel therefore believed that the estimate of an overall decline of 79% was too large. The Panel assigned a reliability index of 0 to these estimates of decline because of the lack of comparability between the earlier and later parts of the time-series.

However, data collected by U.S. and Canadian observer programs for pelagic longline fisheries in the same area were mentioned in the text of the proposal but were excluded from Table 2 in the proposal. The Panel believed that this was probably one of the more reliable datasets of those considered in the proposal, and therefore should have been given more prominence. As noted in the proposal (quoting Baum *et al*. 2003), observers reported a total of 142 white shark records during the 12 years from 1978-1990, but none in 4200 sets

observed during the 13 years from 1990-2002. The National Marine Fisheries Service Pelagic Observer Program samples the U.S. pelagic longline fishery. It has covered 3-5% of the total sets made by the fishery since its initiation in 1992, for a total of 794 pelagic longline trips during which observers spent 10,613 days at sea and observed 5,895 sets and 6,137 hauls. Of the 215,807 target and bycatch vertebrates observed from 1992-2002, 29% comprised sharks and rays, but no white sharks have been recorded since the program began (Beerkircher *et al*. 2004). The Panel recommended that the proponents of the white shark proposal re-examine the observer data cited in their proposal and present the results in a graphical form on an area-by-area basis. The Panel assigned a reliability index of 2-3.

The Panel also noted that the issue of "shifting baselines" should not be overlooked and that the greatest decline in populations of large pelagic fish species in this area probably took place in the 1960s, well before the trends presented in the proposal.

Row 2 (Adriatic Sea): This estimate is based on extremely small sample sizes, although consecutive zeros in the last two decades provide reasonably convincing evidence that the population has declined, at least at the local level (Figure 3 of the proposal). The Panel assigned a reliability index of 2.

Row 3 (KwaZulu Natal, South Africa): The conclusion of a negative trend in catch rates is largely dependent on one or two high points at the beginning of the series (Figure 4 of the proposal). Dudley (2002) queried the reliability of data from the early years and he excluded them from his subsequent reanalysis of the data (row 4). The Panel therefore concluded that Row 3, indicating an overall decline of > 66%, should not have been included in Table 2. The Panel assigned a reliability index of 1.

Row 4 (KwaZulu Natal, South Africa): The decline of greater than 60% over the period 1978 to 1999 reported in Table 2 comes from Figure 5a of the proposal. However, the data in Figure 5a were not corrected for year-to-year anomalies in the deployment of sampling gear (beach protection nets) during the annual peak of sardine runs in June and July. This correction eliminates any significant trend in catch rates (Figure 5b; Dudley 2002). The Panel concluded that estimates based on the corrected data in Figure 5b should have been included in Table 2, but estimates based on the uncorrected data in Figure 5a should have been excluded.

In addition, the proposal does not reference Bergh and Barkai (1996) who re-examined a subset of the data for the effects of other covariates such as beach, month and meshing effect (frequency of removing fish from nets). The Panel found that the slope of the standardised CPUE estimated by Bergh and Barkai was slightly negative but non-significant.

At the request of the Panel, C. Duffy and G. Cliff, Natal Sharks Board, provided a four-year update of the non-standardised beach protection data (Figure E.2). These data also have a negligible, non-significant slope.

The Panel assigned a reliability index of 3-4 for the information included in Figure 5b, Bergh and Barkai (1996) and the updated time series from Duffy and Cliff.

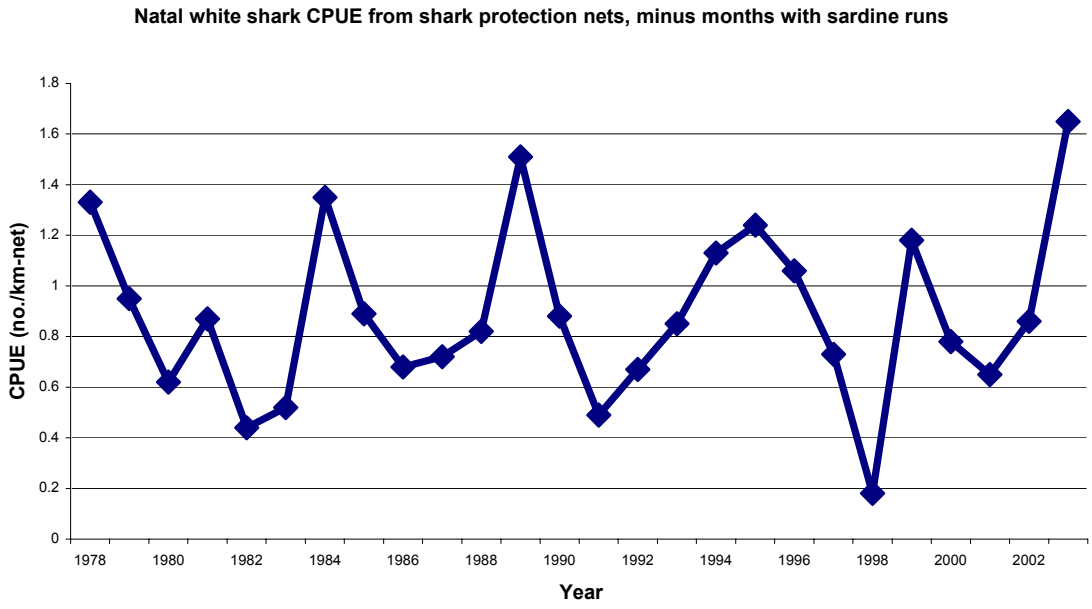

Figure E.2. Updated time-series of non-standardised catch rates from the KwaZulu Natal, South Africa beach protection programme (C. Duffy, Natal Shark Board, pers. comm.)

Row 5 (New South Wales, Australia): Figure 6 of the proposal appears to represent two different time-series with a breakpoint around 1978-79 when effort increased. The estimates in the latter part of the series are certainly lower than the estimates in the earlier part of the series, but the Panel questioned the validity of the conclusion that there has been an overall decline of >70%, based on a comparison of the earliest and most recent points. The Panel suggested that it would be more reasonable to compute the average of each of the two parts of the series and compare these numbers. This would result in an overall decline similar to the estimate of about 50% since the 1950s from Malcolm *et al*. (2001). Malcolm *et al*. also pointed out that the estimated decline would be higher if data were available for earlier years. The Panel assigned a reliability index of 2-3.

Row 6 (New South Wales, Australia): The decline in average size from 2.5 m to 1.7 m appears to be consistent. The decline might be due to increasing fishing mortality which typically results in reductions in average size. The Panel suggested that an age-structured model be developed to determine whether the decline in average size is compatible with estimated removals. The years reported in the table are incorrect (should refer to the 1950s to 1990s, not the 1950s to 1970s). Since changes in average size differ qualitatively from changes in indices considered proportional to abundance (such as CPUE), the Panel considered it inappropriate to assign a reliability index in this case.

Row 7 (Queensland, Australia): Trends in catch per unit of effort of white sharks caught in nets and drum lines in the Queensland shark control programme include a large number of data points and provide more convincing evidence of a long term decline (Figures 7 and 8 of the proposal). The Panel assigned a reliability index of 3-4.

Row 8 (Southeastern Australia): The Panel noted that it would have been useful to include graphs illustrating the estimated declines in the proposal itself in order to facilitate a full evaluation of the trends. The Panel assigned a reliability index of 3-4.

Row 9 (South Australia): The Panel noted that it would have been useful to include graphs illustrating the estimated declines in the proposal itself in order to facilitate a full evaluation of the trends. The Panel assigned a reliability index of 1.

Regarding rows 8 and 9, as the proposal itself and Malcolm *et al* (2001) note, these declines could be explained at least in part by factors such as changes in fishing grounds, changes in fishing gear and techniques, and a move to tag and release fisheries.

Other comments: The Wildlife Conservation Society workshop held in January 2004 (CITES document AC20 Inf.1) was unable to identify any datasets showing increasing trends, even for those white shark populations or parts of populations that have received protection for several years.

Utilization and Trade

Based on information contained in the proposal, the main white shark products traded internationally appear to be jaws, teeth and fins. Volumes are apparently not large but products are very highly valued and there is documented demand. There have been several seizures of small consignments in international trade but not major seizures.

Comments from Mexico on the proposal suggest that the skins (white shark leather) are also in international trade. However, the magnitude and importance of such trade is unknown. Mexico provided trade data indicating that in 1999, 4676 pieces of skins were exported, 352 pieces were re-exported and 13,202 pieces were imported, but the size of the pieces was not indicated. The Panel believes that the extent of trade in white shark skin products should be further investigated, particularly because of the implementation problems this may pose (see below).

Conservation and Management

As the proponents of the white shark proposal pointed out, several Parties (South Africa, Namibia, Commonwealth Australia and all States and Territories of Australia, U.S. Atlantic and Gulf coast federal waters, California and Florida state waters, Malta, and New Zealand) have instituted complete or partial protection programmes for white sharks. However, due to evidence of regular long-distance, transboundary movements of white sharks, protective measures implemented through national legislation may be insufficient by themselves. The white shark proposal makes the statement that "no Regional Fisheries Management Organizations are known to be collecting data on white shark catches, planning or undertaking white shark stock assessments or planning to implement regional management of shared white shark stocks." The Panel sent e-mail messages to RFMOs asking them to address this statement. The Commission for the Conservation of Southern Bluefin Tuna (CCSBT), International Commission for the Conservation of Atlantic Tunas (ICCAT), Indian Ocean Tuna Commission (IOTC) and the Inter-American Tropical Tuna Commission

(IATTC) stated that they were collecting information on catches of sharks. CCSBT had produced a pamphlet for fishers to facilitate shark identification, including white shark. IATTC has observers on purse seine vessels who collect information on sharks. There are no records of white sharks being taken on these vessels. ICCAT reported that some bycatches of white shark had been recorded. None of the replies received referred to assessments of white sharks being planned or implemented, but the Southeast Asian Fisheries Development Centre (SEAFDEC) and IOTC reported that their Members were working on National Plans of Action for Sharks, and IOTC has also agreed to develop a Regional Plan of Action.

Likely Effectiveness for Conservation

The Panel was uncertain whether an Appendix II listing would provide a conservation benefit to white sharks and, in particular, whether it would help to stem illegal trade. Since there is no annotation with the current Appendix III listing, there is uncertainty about whether or not it applies only to whole specimens, a form in which the species is rarely traded. Because the Appendix III listing did not come into effect until late 2001, there are few data available to assess its impact.

Jaws, teeth and fins are sufficiently distinctive for this species that they should not create look-alike problems with other shark species. However, once white shark skin is stripped of its denticles and treated to make leather products, it could be confused with leather from other shark species and may create look-alike problems, possibly requiring other shark species to be listed on Appendix II under Annex 2b, or other means of addressing implementation problems. The Panel noted the importance of an expert study to determine the extent of the current or potential trade in all white shark products.

Other Observations

The CITES Secretariat informed the Panel that an Appendix II listing with zero quota is actually more restrictive than an Appendix I listing, because Appendix I listings generally allow for international trade for scientific purposes or for personal use. Once adopted, future changes from either of these types of listings to an Appendix II listing with positive quota both require a two-thirds majority of the Conference of the Parties. Given the intent of Appendix II listings, which is to bring exploitation levels under control and prevent further depletion, the Panel questioned the logic of a zero quota if an Appendix II listing were to be supported by the Parties and agreed that if a species does not qualify for an Appendix I listing, it seemed inappropriate to have a zero quota simultaneously imposed by the Conference of the Parties.

EVALUATION AGAINST CITES LISTING CRITERIA

The criteria relevant to the proposals for an Appendix II listing considered by the Panel are those in Annex 2a in conjunction with the guidelines in Annex 5 of Resolution Conf. 9.24 (Rev. CoP12). However, a revision of this Resolution is currently underway. The draft version of the revision at the time of the Panel meeting (CITES document CoP13 Doc. 57) differs in a number of respects from Res. Conf. 9.24 (Rev. CoP12). Most importantly, for commercially-exploited aquatic species, it includes revisions in the wording of the Annex 2a

criteria and the associated Annex 5 decline guidelines, as detailed below. Resolution Conf. 9.24 (Rev. CoP12) will be used for the next CoP meeting (CoP13). However, FAO considers the current revision (CoP13 Doc. 57) to be more appropriate for commercially-exploited aquatic species.

Resolution Conf. 9.24 (Rev. CoP12) Annex 5 indicates under the decline guideline that "*a decrease of 50% or more in total within 5 years or 2 generations whichever is the longer has been found to be an appropriate guideline (not a threshold) of what constitutes a decline",* but also notes that *"these figures are presented only as examples since it is impossible to give numerical values that are applicable to all taxa. There will be many cases where these numerical guidelines do not apply*." FAO Fisheries Report 667[3] provides recommended guidelines for interpreting declines in commercially-exploited aquatic species. These guidelines are the result of extensive review and analysis of theory and empirical results for marine fish population dynamics. They are considered by FAO to represent the best current guidance for interpreting declines in application of the CITES criteria to commercially-exploited aquatic species and accordingly should be used instead of the 50% guideline given as an example in Conf. 9.24 (Rev. CoP12). The FAO guidelines on decline are summarised as a footnote to the Annex 5 decline guidelines in the CITES revised draft criteria (CoP13 Doc. 57). If adopted by CoP13 in October 2004, the revised draft criteria would replace the existing criteria and guidelines in Conf. 9.24 (Rev. CoP12).

Panel assessment relative to Resolution Conf. 9.24 (Rev. CoP12):

Annex 2a:

"*A species should be included in Appendix II when either of the following criteria* [A or B] *is met*."

Annex 2a, criterion A: "*It is known, inferred or projected that unless trade in the species is subject to strict regulation, it will meet at least one of the criteria listed in Annex 1 in the near future.*"

Panel evaluation: Two Annex 1 considerations were evaluated: small population size and decline. The Panel concluded that the proposal contained no estimates corresponding to total population size and therefore no basis for judging that the population is sufficiently small to meet this listing criterion. The Panel also concluded that the Annex 5 guideline of a decline of "*50% or more in total within the last five years or two generations, whichever is the longer*", is not a relevant consideration for commercially-exploited aquatic species. A 50% reduction from a relatively unexploited level is usually considered to be near-optimal for maximizing species productivity (it is usually somewhat above or near the biomass associated with maximum sustainable yield). The Panel concluded that the FAO Fisheries Report 667 recommendations, as incorporated in the CoP13 Doc. 57 Annex 5 footnote, are more relevant for commercially-exploited aquatic species (see relevant section later).

[3] FAO. 2002. Report of the Second Technical Consultation on the Suitability of the CITES Criteria for Listing Commercially-Exploited Aquatic Species. Windhoek, Namibia, 22-25 October 2001. *FAO Fisheries Report* **667**. FAO, Rome. 87pp.

Annex 2a, criterion B: "It is known, inferred or projected that the harvesting of specimens from the wild for international trade has, or may have, a detrimental impact on the species by either:

i) exceeding, over an extended period, the level that can be continued in perpetuity; or

ii) reducing it to a population level at which its survival would be threatened by other influences"

Panel evaluation: In terms of the trade aspect of this criterion, there was insufficient information provided in the proposal for the Panel to develop an informed opinion about the relative importance of international trade to the conservation status of white shark. The number of white shark items in international trade does not appear to be large but items such as jaws and teeth are of high value and could create incentives to target large females at aggregation sites which would pose a conservation threat to the species.

With respect to the biological criteria, the Panel concluded that historical catches for the Australian and Adriatic components of the population probably could not be continued in perpetuity. There is less certainty about the impacts of current reduced catches in Australia. For South Africa, catches in recent decades appear to be sustainable. For the Northwest Atlantic, sustainability of recent catches is uncertain because of limitations in the data and inappropriate treatment of the data in some of the sources used. It is not certain whether the global population has been reduced to a level at which its survival would be threatened by other influences (see below). Nor is it clear to what extent international trade is implicated in the population trends.

Panel assessment relative to revised criteria incorporating FAO recommendations (CoP13 Doc. 57):

Annex 2a:

"*A species should be included in Appendix II when, on the basis of available trade data and information on the status and trends of the wild population(s), at least one of the following criteria* [A or B] *is met."*

Annex 2a, criterion A: "It is known, or can be inferred or projected, that the regulation of trade in the species is necessary to avoid it becoming eligible for inclusion in Appendix I in the near future."

Annex 2a, criterion B: "It is known, or can be inferred or projected, that regulation of trade in the species is required to ensure that the harvest of specimens from the wild is not reducing the wild population to a level at which its survival might be threatened by continued harvesting or other influences."

Panel evaluation: In terms of the trade aspect of this criterion, the same comments made above apply. There was insufficient information provided in the proposal for the Panel to

develop an informed opinion about the relative contribution of international trade to the population declines in white shark.

With respect to biological criteria, the Panel again referred to the CoP13 Doc. 57 Annex 5 footnote for commercially-exploited species which it considered relevant to both criteria A and B. The relevant parts of this footnote are: (i) [For an Appendix I listing] "*a range of 15-20% is deemed to be applicable for species with low productivity*", (ii) "*even if a population is not declining appreciably, it could be considered for listing in Appendix II if it is near the extent of decline guidelines mentioned above for consideration for Appendix I listing. A range of between 5% and 10% above the relevant extent of decline might be considered as a definition of 'near', taking due account of the productivity of the species*", and (iii) "*a recent rate of decline is important only if it is still occurring, or may resume, and is projected to lead to the species reaching the applicable point for that species in the Appendix I extent of decline guidelines within approximately a 10 year period*".

The Panel concluded that declines to near the 15-20% level may be reflected in the Australian and Adriatic time-series, but not in the South African time-series. The extent of decline in the Northwest Atlantic population is uncertain due to limitations in the data and inappropriate treatment of the data in some of the sources used. There is adequate evidence in the Australian and Adriatic time-series to conclude that these components of the global population or populations are probably within the "buffer zone" implied in (ii). Again, the South African abundance trends do not appear to satisfy these guidelines, and abundance trends in the Northwest Atlantic are uncertain due to limitations in the data.

OVERALL CONCLUSIONS

Available evidence suggests that white sharks are naturally rare, have low productivity, and have suffered marked depletions in several areas, at least on a local scale. The Panel concluded that the available evidence could support a range of hypotheses, and that it was not possible to confirm or exclude the possibility that the species as a whole meets the criteria for listing in Appendix II. It also had concerns about the way the data in the proposal (particularly Table 2) were presented, and about the reliability of some of the numbers as indices of population abundance. Further, the Panel questioned the logic of a zero quota if an Appendix II listing were to be supported by the Parties and agreed that if a species does not qualify for an Appendix I listing, it seemed inappropriate to have a zero quota simultaneously imposed by the Conference of the Parties.

White Shark Proposal, Annex I. Distribution and centres of abundance for the white shark (supplementary information for Figure 1).

The white shark is most commonly recorded from the waters of Southern Africa (particularly from Namibia to KwaZulu-Natal and Mozambique); Eastern, Western and particularly Southern Australia; New Zealand; the Japanese archipelago; the North-eastern seaboard of North America, especially Long Island and environs; the Pacific coast of North America, primarily from Oregon to Baja; the coast of Central Chile; and the Mediterranean Sea, primarily the Western-Central region and Tyrrhenian Sea (Fergusson *et al*. in press[4]).

Known centres of abundance including breeding areas:

1. Eastern North Pacific off northern and southern California, with adults of both sexes and young of the year off southern California, probably extending to the west coast of Mexico. No pregnant females reported.

2. Western North Atlantic coast of the United States, in the Mid-Atlantic Bight from southern Massachusetts to New Jersey, including adults of both sexes and probably young of the year, but no pregnant females reported.

3. Eastern South Atlantic and Southwestern Indian Ocean: the southeast coast of South Africa from False Bay to the Eastern Cape and KwaZulu-Natal, with adults of both sexes and probably young of the year, but no pregnant females reported.

4. Southeastern Indian Ocean and Western South Pacific: Southeastern Australia (Western Australia to New South Wales and Queensland), including the Great Australian Bight, with adults of both sexes, pregnant females, and small young, possibly young of the year, reported. New Zealand similar with young and pregnant females but possibly contiguous with Australian area via migration.

5. Western North Pacific: Japan and possibly adjacent areas of Korea and China, including Taiwan. Pregnant females and young known, but more poorly known than other areas.

6. Mediterranean: primarily Western-Central region and Tyrrhenian Sea, mating and pregnant females recorded. Now extremely rare here.

[4] Fergusson, I.K., Compagno, L.J.V., and Marks, M.A. In press (2004). White shark *Carcharodon carcharias*. In: Fowler, S.L., Camhi, M., Burgess, G.H., Cailliet, G., Fordham, S.V., Cavanagh, R.D., Simpfendorfer, C.A. and Musick, J.A. In Press (2004). *Sharks, rays and chimaeras: the status of the chondrichthyan fishes*. IUCN SSC Shark Specialist Group. IUCN, Gland, Switzerland and Cambridge, UK.

APPENDIX F

FAO ad hoc Expert Advisory Panel Assessment Report: Humphead Wrasse

PROPOSAL NO.:33

SPECIES: *Cheilinus undulatus* - Humphead wrasse

PROPOSAL: Inclusion of *Cheilinus undulatus* in Appendix II in accordance with Article II, paragraph 2(a) of the Convention and Resolution Conf. 9.24 (Rev. CoP12), Annex 2a, Paragraph B.

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ASSESSMENT SUMMARY

The FAO ad hoc Expert Advisory Panel concluded that the available evidence supports the inclusion of humphead wrasse on CITES Appendix II based on criterion 2a B and possibly on 2a A. This conclusion is based on its high vulnerability, low productivity and evidence of widespread and serious impacts of exploitation throughout most of the range of the species.

Humphead wrasse is a low productivity species with fragmented distribution that, owing to its large size and sedentary nature, is highly vulnerable to the method of fishing used to capture individuals of the species. Consequently, populations can be easily depleted at even medium fishing intensities. It is among the most vulnerable species, if not the most vulnerable in the reef fish assemblage of which it is a part. There is convincing evidence that there have been substantial declines in local abundance at numerous points within its range leading to the inferred conclusion that depletion is a widespread phenomenon. There is also convincing evidence of trade-driven exploitation that has expanded over the past three decades to cover most of the species range. Owing to the high value of the species in the live reef food fish markets, trade is considered to be a significant factor in the depletion of this species. This situation is exacerbated by the fact that humphead wrasse are also exploited for local consumption in most range countries. Management of reef fisheries, including those for wrasse, are inherently difficult. The Panel concluded that regulation of trade as a result of CITES listing could make a significant contribution to the conservation of this species. A CITES listing alone would not provide a complete solution to the conservation problems for this species. Therefore strengthening of regional and national management of the live reef food fish trade and domestic fisheries is also necessary to ensure protection of the humphead wrasse.

PANEL COMMENTS

Distribution and habitat availability

Maps provided from Sadovy *et al*. (2003) combined with a ReefBase map of coral reefs, demonstrate that although the area of the species' distribution extends widely across the Indo-

Pacific region, its actual coral reef habitat is patchily distributed and occupies a relatively small proportion of the distribution area (Figure 1 of Sadovy et al. 2003). This is not immediately evident from the text description provided in the proposal. Within coral reef areas, humphead wrasse adults are concentrated within specific habitats: outer reef areas, reef channels and passes.

Population status and trends

The explanation of the spatial analysis of humphead wrasse densities in relation to fishing intensity presented in Figure 1 of the proposal does not enable a full interpretation. That there was only one unfished area diminishes the weight that the Panel was able to give to this category as a historical baseline. However, the appreciable decline in fish density from fishing index category one (lowest) through to five (highest) adequately demonstrates the impact of fishing on local abundance. It also suggests considerable variability in local abundance in the species. The fact that the fish density counts in the data represented in the figure by the open squares were all made by the same survey team, according to a standard methodology makes these data the most credible.

The fishing index used in Figure 1 in the proposal is a combination of human population density in the fishing area and expert judgment of fishing intensity on a scale of 1-5. As different experts were used in different areas and their responses were not standardised, there may have been inconsistencies between areas in the relation of the index to actual fishing intensity. However, in the absence of actual effort or capacity data, the use of such an index was considered appropriate.

The numbers of humphead wrasse individuals per unit area from Reef Check surveys were considerably higher than those from the surveys presented in Figure 1 of the proposal. Discrepancies between these two sources may be inherent in the methodologies or due to the use of volunteers by Reef Check. The Reef Check surveys are considered to be less reliable than the scientific surveys presented in proposal Figure 1 because the former were not designed specifically for humphead wrasse. The presentation of the survey data in Figure 1 of the proposal as 'fish/10 000 m^2' and the data from the Reef Check surveys as 'fish/100 m^2' does not facilitate comparison.

The life-history characteristics of humphead wrasse make it difficult to fit into the resilience (productivity) scale provided in FAO Fisheries Report 667. Although long-lived, it matures relatively early. On the basis of these characteristics alone it might be considered to be of medium rather than low resilience. However, the apparent dependence of successful spawning on the presence of a few large males that pair spawn with a harem of females may reduce resilience when the large males are targeted. Targeting fish in spawning aggregations may disrupt spawning, but the extent of this is not known. In humphead wrasse, small satellite males are not believed to play any significant role in fertilising eggs. The role of sex-change in providing replacement dominant males is poorly understood.

The available age data from part of the Great Barrier Reef referred to in the proposal, when analysed using a regression approach for ages 5 and above, yield an estimate for total mortality of $Z=0.11$. The Panel considered that the scientific validity of this analysis could be

improved by use of the Chapman-Robson method, but this would make little difference to the result. Since catches from the area sampled are light and quite recent, the effect of fishing mortality on this estimate will be very small, so that this approach provides a useful estimate of natural mortality (M=0.11), which suggests that the species should be regarded as one of low productivity.

Also with regard to resilience, the relative importance of self-recruitment versus recruitment from up-current spawning stocks is unknown. Therefore, depending on reef location in relation to current patterns, recruitment to depleted stocks may not be a simple function of reproductive output from those stocks. Possible down-current effects of depletion of up-current stocks may affect resilience. The recruitment pulse that occurred in Guam in the absence of a known spawning stock may reflect planktonic dispersal and illustrates the uncertainty in resilience of this species.

The information presented on temporal trends in abundance appeared to be a comprehensive compilation of available information, but the information varied in quality. Some reported trends were survey-based while others were anecdotal. This information is summarised and commented upon in Table F.1.

Table F.1. Summary of humphead wrasse abundance time-series. These time-series are ranked on a scale of 0-5 according to the Panel's population abundance index reliability scale (See Table 1 in "General Comments and Observations"). The information presented corresponds to proposal pages 3-7. It does not include the "spatial" information from fished versus unfished areas).

Country/series	Source	Abundance	Type	Reliability index
1. Malaysia -- Kudat trader purchases, all sizes	Hendry pers.comm.	1995: 3500 kg/y 2002: 300 kg/yr	Trader receipts Catch data, no effort	2-3 Some effort information implied as the catch was from a consistent subset of vessels
2. Malaysia catch rates, boats supplying same trader	Hendry pers.comm.	1995: 10kg/boat/month 2002: 0 kg/boat/month	Trader receipts	3
3. Australia – Queensland	Samoilys 2002	1989: 6 kg/boat/day 1992: 25 1993-98: 20	Catch data	2 Market driven, so may not reflect abundance well
4. Aust – Qland	OConnell pers.comm.	1991: 0.23 t/boat/day 1998: 0.12	Pers comm	3
5. Aust – Qland	Pogonoski 2002	recent catches much lower than historic	Review conclusion	3
6. Aust – reef observations	OConnell in lit. 2002; a. Johannes and Squire 1988. b. volunteer divers	a. spawning aggregations of 100s, 1980s b. aggregations 10 or less since 1999	Observed aggregations 2 points	1-2

Table F.1. Summary of humphead wrasse abundance time-series (continued)

7. Aust Qland outer reefs	Oconnell	catches now much lower than historic	Anecdotal	1
8. Aust – barrier reefs, AIMS	OConnell in lit. 2002	no longer found at historical sites, monitored since 1992	Anecdotal	1
9. Aust – Swain and Pompey reefs, Qland Museum	Oconnell in lit. 2002	much reduced from 50s-60s	Anecdotal	1
10. Fiji	Thaman 1998	virtually disappeared from some places	Anecdotal	1
11. Fiji	Dulvy *et al*. 2003	possibly extirpated from one island	Anecdotal	1
12. Fiji fishermen interviews (N=24 who caught the species)	SCRFA 2003	70s-80s: 2-5 fish/month now: 1 fish/m or less	Standardised questionnaires	3
13. Fiji annual sales	Fiji Dept of Fisheries	1994 and 1996: 22.5t 2002: 10.6 t 2003: 3.5t	Catch data, no effort	2-3
14. Indonesia fishermen	Bentley 1999	early 1990s: 50-70 kg/month late 1990s: 10-50 kg/month Serial depletions noted as common.	Structured interviews	3
15. Indonesia diver reports	Erdmann pers.comm.	uncommon where once readily seen	Anecdotal	1
16. SW Sulawesi and Kei fishermen interviews (N=40)	SCRFA 2003	rare last 10-15 yrs where fished; still seen or incidentally taken where unfished	Standardised questionnaires	3
17. Palau fishermen interviews (N=9 fishing the species)	SCRFA 2003	declined	Standardised questionnaires	3
18. Palau market catches (p. 10 nr top)	Sadovy *et al*. 2003	1986: 3500 kg 1993: 682 kg 1994: 138 kg 1995: 26 kg 1996: 0 kg	Catch data, no effort	2
19. Japan, Ryuku I. Region, Okinawa Prefecture	Fishery Agency Japan	1994-2003: Stable landings of about 9 t	Catch data, no effort	2

In many of the cases in Table F.1, there is the likelihood that fuller information on methods of data collection and analysis could lead to higher assignations of reliability. In several of the cases reported in the Table, declines in fish size were also reported (lines 5, 12, 14, 16,17). Scarcity of humphead wrasse in surveys in areas of suitable habitat where it was expected to occur in Fiji is not considered to provide a strong indication of depletion as there is the possibility that it was only present in small densities there in the past. In its country

response, Indonesia indicated that humphead wrasse are common and locally abundant throughout its waters. The information from fisher interviews in Indonesia and Fiji (lines 12 and 16), which is considered amongst the most reliable, is presented in Figure F.1.

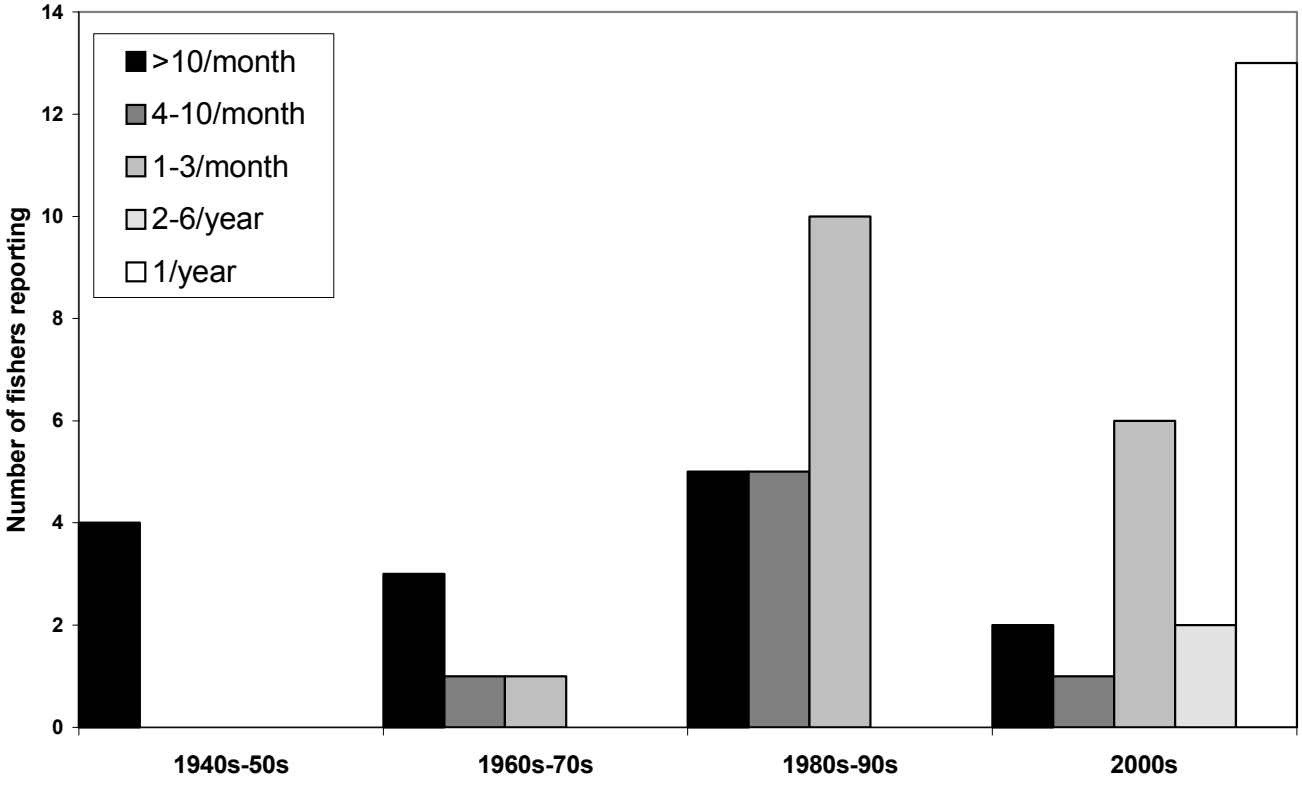

Figure F.1. Adult humphead wrasse catch rates reported from fisher interviews in Fiji and Indonesia in 2003/4 (N=53) . The data show perceived temporal changes in catch rates from interviews. Society for the Conservation of Reef Fish Aggregations (full reports to be posted on www.scrfa.org)

The distribution of coral reef habitats throughout the range of the humphead wrasse is shown in Figure F.2. The locations for the time-series information summarised in Table F.1 are also shown.

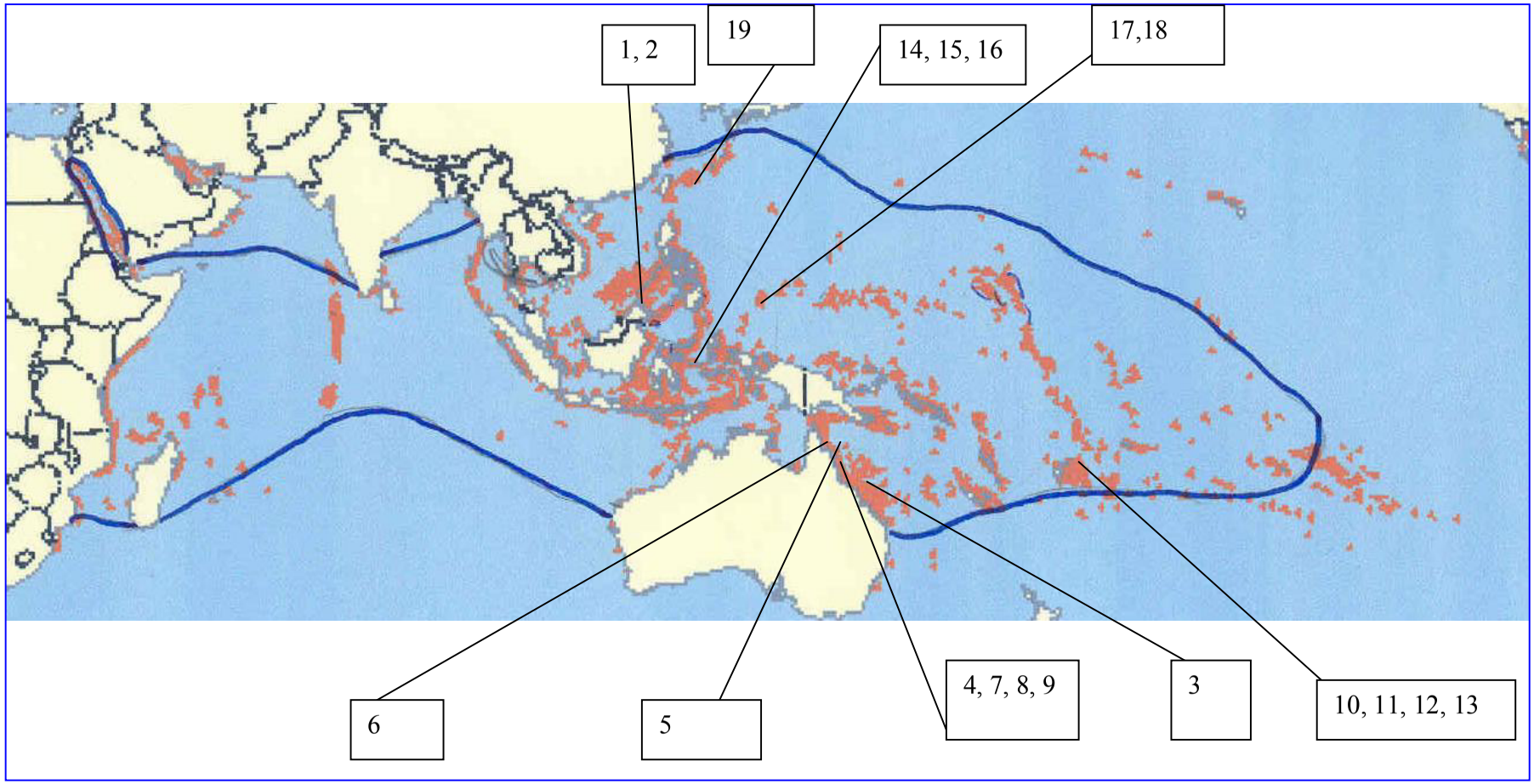

Figure F.2. Geographic distribution of humphead wrasse. The distribution of the species falls within the solid line and around the reef areas (dark shaded scattered areas represent coral reefs). The numbers refer to the line items in Table 33.1.

The question of the proportion of total area of distribution within which humphead wrasse stocks are considered to be critically depleted was raised as being fundamental to the assessment. In regard to this question, the Panel noted the observation by Hong Kong fish traders and source country information that exploitation had progressed sequentially outwards from Hong Kong (the primary importer). This progression was illustrated in a supplementary map (Figure F.3) depicting the geographic expansion of the live reef fish fishery (Asian Development Bank 2003) in decadal increments. By the 2000s, at least 86% of all reefs in the geographic range of the humphead wrasse were exploited for this species (including for both domestic and international trade); in addition, most other reefs in the range of this species are exploited but at unknown levels of fishing effort as far as the humphead wrasse is concerned (Asian Development Bank 2003).

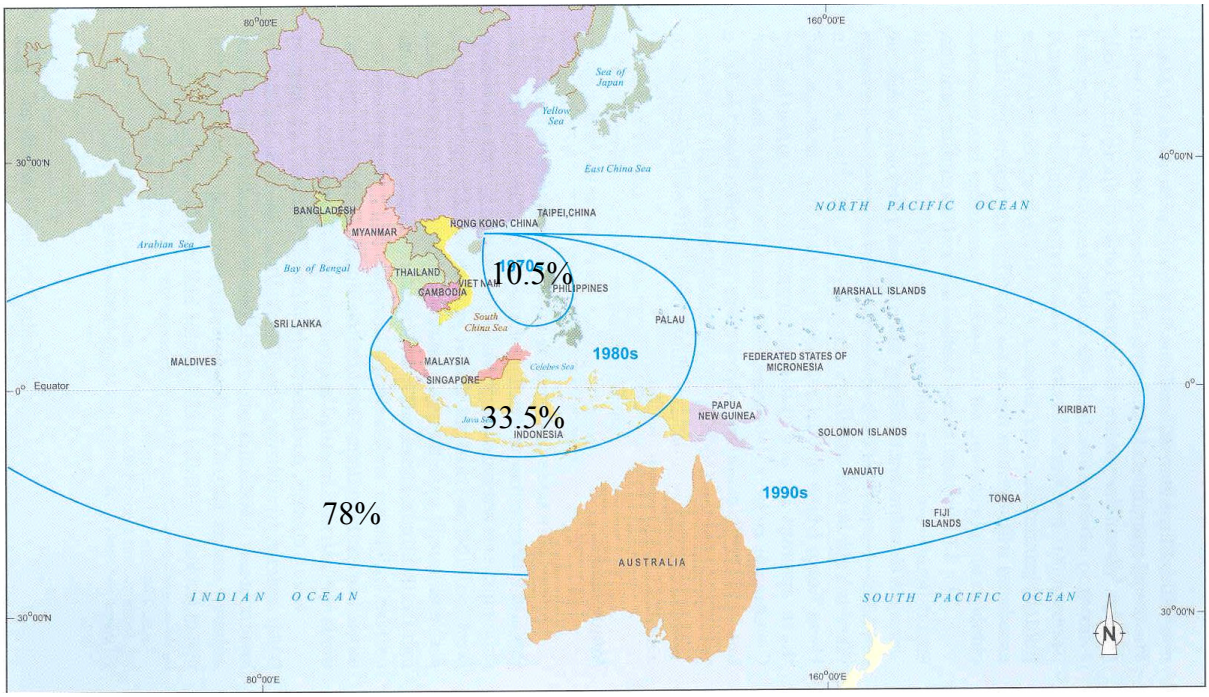

Figure F.3. Map showing cumulative expansion of the trade in live reef fish centred in Hong Kong from the 1970s (inner circle), 1980s (middle circle) and 1990s (outer circle) showing percentages of total reef area for the species encompassed by exploitation activities (from Asian Development Bank 2003).

The most extensive exploitation (by volume of fish) appears to be associated with the live reef food fish trade for export with a sequential expansion of area fished from the 1970s through the 1980s and into the 1990s, covering 10.5%, increasing to 33.5% and then to 78% of the total reef area in the range of the species by the 1990s (Figure F.3). Expansion of the trade has occurred as demand for live fish for food has increased and as businesses continue to seek supplies of live reef fish (including humphead wrasse but mainly groupers) (Asian Development Bank, 2003).

The Panel estimated fishing pressure for the 1990s in areas exploited for the live reef food fish trade to provide an indication of the extent of fishing pressure in the area affected (Figure F.4). High pressure is assigned to those countries in which the species is extensively (i.e.

widely) taken from reef areas (this is roughly equivalent to the highest fishing index in Fig. 1 of the proposal). Medium pressure is roughly equivalent to the middle level fishing index in Fig. 1 of the proposal. Low pressure is considered to apply to countries which have low levels of export of live fish, roughly equivalent to the lowest level fishing index in Fig. 1 of the proposal. Areas for which there is no indication of level of fishing pressure are not included in Figure F.4.

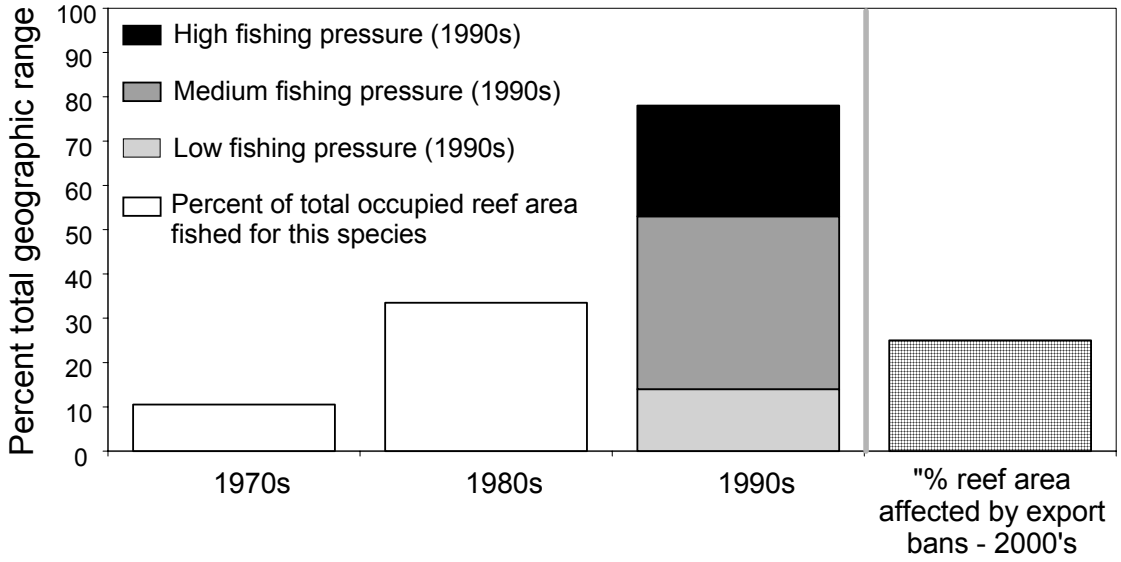

Figure F.4. Percent geographic range subject to live reef food fish trade for 1970s, 1980s and 1990s (see Figure F.3). For the 1990s, this area was divided into fishing intensity categories (see text for explanation and Annex 1 of this report for data). The bar to the extreme right shows the percentage of reef area that falls under legislation prohibiting export of humphead wrasse as of the end of 2003.

As of 2003, approximately 25% of reefs in the species' range fell within the jurisdiction of countries which do not allow export of the humphead wrasse, with Australia representing the biggest reef area and implementing their regulation in December 2003. Regulations for certain size classes are in effect in other countries but exemptions for 'culture' allow capture and grow out of juveniles for export. Moreover, illegal exports limit the degree of protection for the species (Sadovy et al. 2003, Asian Development Bank 2003).

With regard to biological parameters, the Panel concluded the following.

- Owing to a combination of life-history parameters and reproductive behaviour, humphead wrasse is probably in the low productivity category on the FAO productivity scale.
- Although most of the time-series in Table F.1 are in the low to mid range of the reliability scale, all but two indicate population declines, so that taken as a whole they indicate widespread and for the most part serious decline of local populations throughout the species range.
- There is clear indication of sequential exploitation and depletion of this species for the live reef food fish trade over the past three decades (70s-90s) extending outwards from the centre of import trade to cover about 78% of the reef habitat area.

- Including fishing for local consumption, exploitation covers a large proportion (about 86%) of coral reef habitats within the species range.

Threats

Humphead wrasse are particularly vulnerable to exploitation for several reasons:

- the species falls within FAO's lowest productivity category and is one of the most valuable of the multispecies assemblage exploited for the live reef food fish trade;
- individuals are large and sedentary in specific habitats that are easily accessible by diving;
- the nature of harvesting by SCUBA divers on coral reefs is such that with high visibility and easily identifiable topography, divers can cover entire reef areas effectively;
- during spawning, adults are even more accessible in predictable areas;
- the distribution is fragmented, probably resulting in a large number of small populations with limited interconnection, which increases the susceptibility of these populations to extirpation.

The aspects of threat presented in the proposal are all facets of the same problem: the exploitation of a highly vulnerable species for international trade. The proposal stated that the species is dependent on healthy coral reef ecosystems. Furthermore, it stated that, at the centre of the humphead wrasse distribution, 88% of the coral reefs are at risk and 50% are at very high risk from habitat degradation. The Panel noted that the humphead wrasse has age-specific habitat requirements. In particular, the large males, which are important for reproductive success, have very narrow habitat requirements. The Panel had no information on the rate of habitat destruction.

Utilization and Trade

Clarification of the information provided in the proposal on international trade in humphead wrasse revealed that this species is a high value but minor component of a much larger general trade in live reef fish that drives the movements of trading vessels and air shipments. Thus low availability of humphead wrasse is not likely to have a feedback effect on the extent of the live reef food fish trade, and live reef food fish trade shipping opportunities will remain high as long as other species are available. Therefore, if unregulated, a high proportion of humphead wrasse will probably continue to be exported whenever captured.

A shift from boat to air shipment may indicate the sequential shift in exploitation to areas that are farther away from the primary market. However, other factors such as reduced cost, increased availability and higher survival rates for shipped animals may also have played a role in the increase in use of air transportation. The Panel also noted that air transportation may well be easier to monitor than sea transportation.

Scarcity of humphead wrasse appears to have led to increased prices in Hong Kong. The Panel was provided with supplementary information indicating that between 1996 and 2003

prices corrected by the Consumer Price Index and the Consumer Satisfaction Index had risen more than would be expected, while availability had declined (Liu 2004)[5].

Conservation and management

As described in the proposal, several range countries have put a variety of management measures in place. These measures range from full protection in Niue to export bans in several countries (Australia, Fiji (upcoming), Maldives, Palau, Philippines). Other measures include minimum size, bans on the use of SCUBA, prohibition of capture of juveniles and prohibition of catch in spearfishing competitions. In Philippines and Indonesia, there are regulations but these include exemptions that allow capture of juveniles for grow-out.

Likely effectiveness for conservation

The Panel noted that there are considerable difficulties involved in managing highly dispersed small-scale fisheries such as those that harvest humphead wrasse. Many of the range states that are involved in exporting live reef fish are Small Island Developing States (SIDS) with typically small land area and human populations relative to marine space, as well as low capacity for enforcement of fisheries regulations. Consequently, it can be expected that national bans on exports will be difficult to enforce, as evidenced by the case of the Maldives. Under these circumstances, control measures applied at the point of importation are more likely to be effective. Given that humphead wrasse is a relatively small component of the live reef food fish trade, traders may prefer to stop trading in them rather than to seek certification and/or risk hold-ups in their shipments. Hong Kong SAR was reported as having an effective CITES control unit. As the main point of importation of live reef food fish in the region, a CITES listing could be expected to significantly reduce illegal trade in live humphead wrasse. It was noted that, in response to the request by the proponents for comment, the Director of the Agriculture, Fisheries and Conservation Department of Hong Kong SAR drew attention to the widely distributed and sometimes remote nature of fisheries for live reef food fish in some countries. He stated that, consequently, CITES listing of humphead wrasse would require careful attention to the procedures for obtaining permits. The Panel also noted that exporters from one major exporting country already need to have export permits and that their experience should prove useful in addressing this issue.

The Panel concluded that regulation of trade as a result of CITES listing could make a significant positive impact in preventing further depletion of this species.

The Panel also noted, however, that owing to the vulnerability of the species and the existence of fisheries for local consumption in many range states, national and regional management programmes for this species should be a high priority. Continued degradation of coral reefs in Southeast Asia and other parts of the humphead wrasse range will continue to affect this species regardless of species-specific management measures considered here.

[5] Liu, L. 2004. Estimated global population and international fishery and trade for the humphead wrasse *Cheilinus undulatus* (Labridae). University of Hong Kong, Unpublished MS

Other observations

The first sentence in the section of the proposal on geographic trends suggested that local depletion and extirpation have taken place largely at the edges of the range, and that stocks are healthy in the centre of distribution. The evidence provided on declines did not support this statement as it indicated depletion at several locations throughout the range.

Mariculture of over-exploited species can assist conservation by satisfying some of the demand for wild caught species. Some countries practice mariculture of humphead wrasse based on the grow-out of wild-caught juveniles, and may even have exemptions to harvest regulations that allow harvest of juveniles for this purpose. The Panel noted that this mariculture practice is nevertheless considered to result in increased fishing pressure on the wild-stocks rather than in the protection that would be added by full-cycle mariculture. Full-cycle mariculture of this species is not yet possible.

EVALUATION AGAINST CITES LISTING CRITERIA

The criteria relevant to the proposals for an Appendix II listing considered by the Panel are those in Annex 2a in conjunction with the guidelines in Annex 5 of Resolution Conf. 9.24 (Rev. CoP12). However, a revision of this Resolution is currently underway. The draft version of the revision at the time of the Panel meeting (CITES document CoP13 Doc. 57) differs in a number of respects from Res. Conf. 9.24 (Rev. CoP12). Most importantly, for commercially-exploited aquatic species, it includes revisions in the wording of the Annex 2a criteria and the associated Annex 5 decline guidelines, as detailed below. Resolution Conf. 9.24 (Rev. CoP12) will be used for the next CoP meeting (CoP13). However, FAO considers the current revision (CoP13 Doc. 57) to be more appropriate for commercially-exploited aquatic species.

Panel assessment relative to Resolution Conf. 9.24 (Rev. CoP12):

Annex 2a:

"A species should be included in Appendix II when either of the following criteria [A or B] *is met."*

Annex 2a, criterion A: "It is known, inferred or projected that unless trade in the species is subject to strict regulation, it will meet at least one of the criteria listed in Annex 1 in the near future."

Panel evaluation: In terms of the trade aspect of this criterion, the Panel concluded that control of trade could have an important effect in preventing further depletion of humphead wrasse populations.

With respect to biological criteria, the Panel concluded that the information in Table F.1, while largely qualitative in nature, was sufficient to satisfy this criterion. This is explained

further in the Panel assessment relative to the revised criteria incorporating FAO recommendations (CoP13 Doc. 57) below.

Annex 2a, criterion B: "It is known, inferred or projected that the harvesting of specimens from the wild for international trade has, or may have, a detrimental impact on the species by either:

i) exceeding, over an extended period, the level that can be continued in perpetuity; or

ii) reducing it to a population level at which its survival would be threatened by other influences"

Panel evaluation: The Panel concluded that the low productivity, high vulnerability to fishing and population fragmentation of humphead wrasse, together with the indications that fishing has already had widespread and serious impacts on local populations of humphead wrasse throughout most its range, were adequate evidence that the species meets the above criteria. Again, this is discussed further in the Panel assessment relative to the revised criteria incorporating FAO recommendations (CoP13 Doc. 57) below.

Panel assessment relative to revised criteria incorporating FAO recommendations (CoP13 Doc. 57):

Annex 2a:

"A species should be included in Appendix II when, on the basis of available trade data and information on the status and trends of the wild population(s), at least one of the following criteria [A or B] *is met."*

Annex 2a, criterion A: "It is known, or can be inferred or projected, that the regulation of trade in the species is necessary to avoid it becoming eligible for inclusion in Appendix I in the near future."

Annex 2a, criterion B: "It is known, or can be inferred or projected, that regulation of trade in the species is required to ensure that the harvest of specimens from the wild is not reducing the wild population to a level at which its survival might be threatened by continued harvesting or other influences."

Panel evaluation: In terms of the trade aspect of this criterion, the same comments mentioned above apply: in the opinion of the Panel, control of trade could have an important effect in preventing further depletion of humphead wrasse populations.

With respect to biological criteria, the Panel again referred to the CoP13 Doc. 57 Annex 5 footnote for commercially-exploited species which it considered relevant to both criteria A and B. The relevant parts of this footnote are: (i) [For an Appendix I listing] "*a range of 15-20% is deemed to be applicable for species with low productivity*", (ii) "*even if a population is not declining appreciably, it could be considered for listing in Appendix II if it is near the*

extent of decline guidelines mentioned above for consideration for Appendix I listing. A range of between 5% and 10% above the relevant extent of decline might be considered as a definition of 'near', taking due account of the productivity of the species", and (iii) "*a recent rate of decline is important only if it is still occurring, or may resume, and is projected to lead to the species reaching the applicable point for that species in the Appendix I extent of decline guidelines within approximately a 10 year period*".

From the available information, summarised in Table F.1, there are a several quantitative estimates of historical extent of decline, and a number of anecdotal sources consistent with those, that indicate populations of humphead wrasse falling within or below the "buffer" zone of 5 to 10% above the relevant Appendix I extent of decline guideline for a low productivity species (15-20% of baseline) included in the Annex 5 footnote in CoP13 Doc 57. These examples include occurrences in Malaysia, Australia, Fiji, Sulawesi and Palau. While the examples from Japan, some parts of Indonesia and two estimates from Australia suggest smaller declines or, in the case of Japan, stability in the populations, the general pattern is indicative of serious declines. In addition, with the exception of Japan and possibly one example from Australia (Table F.1, Row 3), there are no indications that the declines have ceased. Overall, the Panel concluded that, with respect to biological criteria, the information in Table F.1, while largely qualitative in nature, reflects numerous consistent patterns of declines, over a wide spatial distribution, falling within the Cop13 Doc 57 Appendix II decline criteria and hence is considered sufficient to satisfy Annex 2a criterion B and possibly Annex 2a criterion A

OVERALL CONCLUSIONS

Humphead wrasse is a low productivity species with fragmented distribution that, owing to its large size and sedentary nature, is highly vulnerable to the method of fishing used to capture individuals of the species. Consequently, populations can be easily depleted at even moderate fishing intensities. It is among the most vulnerable species, if not the most vulnerable, in the reef fish assemblage of which it is a part. There is convincing evidence that there have been substantial declines in local abundance at numerous points within its range leading to the inferred conclusion that depletion is a widespread phenomenon. There is also convincing evidence of trade-driven exploitation that has expanded over the past three decades to cover most of the species range. Owing to the high value of the species in the live reef food fish markets, trade is considered to be a significant factor in the depletion of this species. This situation is exacerbated by the fact that humphead wrasse are also exploited for local consumption in most range countries. The Panel concluded that humphead wrasse meets the Annex 2a criterion B and possibly also criterion A for inclusion in CITES Appendix II. The Panel also concluded that regulation of trade as a result of CITES listing could make a significant contribution to the conservation of this species. It was noted that a CITES listing alone will not provide a complete solution to the conservation problems for this species. Management of reef fisheries, including those for wrasse, are inherently difficult and strengthening of regional and national management of the fisheries on this species, for both the live reef food fish trade and domestic use, must be a high priority.

Humphead Wrasse Proposal, Annex 1. Information used in assessing the extent of exploitation of humphead wrasse in its range countries.

Country	Reef Area* (km^2)	Fishing Pressure**	Decade first exported live	Exploited nationally	Export to Hong Kong***
India	5790	U			
Maldives	8920	M	****1990		Yes
Sri Lanka	680	U	1990		Yes
Chagos Archipelago	3770	U	?poaching		
Comoros	430	U			
Kenya	630	U			
Madagascar	2230	M		Yes	
Mayotte	570	M		Yes	
Mozambique	1860	L		Yes	
Seychelles	1690	L	1990	Yes	Yes
Somalia	710	U			
South Africa	50	U			
Tanzania	3580	L		Yes	
American Samoa	220	M		Yes	
Australia	48960	M	1990	Yes	Yes
Cook Is.	1120	L	1990	Yes	Yes
FSM	4340	M	1990	Yes	Yes
Fiji	10020	L	****1990	Yes	Yes
French Polynesia	6000	H		Yes	
Kiribati	2940	L	1990	Yes	Yes
Marshall Is.	6110	M	1990	Yes	Yes
Nauru	50	U			
New Caledonia	5980	L		Yes	
Niue	170	U		Yes	
Palau	1150	M	****1980	Yes	Yes
Papua New Guinea	13840	L	1990	Yes	Yes
Samoa	490	L		Yes	
Solomon Is.	5750	H	****1990	Yes	Yes
Tonga	1500	U			
Tuvalu	710	L	1990		Yes
Vanuatu	4110	L	1990		Yes
Wallis & Futuna	940	U			
Egypt	3800	U			
Eritrea	3260	U			
Israel	10	U			
Jordan	50	U			
Saudi Arabia	6660	U			
Sudan	2720	U			
Brunei	210	U			
Cambodia	50	M	1980		Yes
Indonesia	51020	H	***1980	Yes	Yes

Japan	2900	M		Yes	
Mainland China	1510	H	1970	Yes	Yes
Malaysia	3600	H	1980	Yes	Yes
Myanmar	1870	M	1990		Yes
Philippines	25060	M	****1970	Yes	Yes
Singapore	100	M	1980	Yes	Importer
Taiwan	940	M		Yes	Importer
Thailand	2130	H	1980		Yes
Vietnam	1270	H	1990	Yes	Yes

Notes:
Total reef area in geographic range of species 252510 km square (Spalding et al., 2001)
GUAM reef area unavailable - national level use only - dead fish
Regulations confer complete protection from export in Maldives, Australia, Niue and Palau
* Spalding et al. (2001)
** Fishing pressure
(U)nknown fishing pressure (could be low or none)
(L)ow fishing pressure - roughly equivalent to fishing intensity 1 in Fig. 1 of proposal
(M)edium fishing pressure - roughly equivalent to fishing intensity 3 in Fig. 1 of proposal
(H)igh fishing pressure - roughly equivalent to fishing intensity 5 in Fig. 1 of proposal
*** Data from Agriculture and Fisheries Dept. Hong Kong, HK govt. census and statistics office; Lau and Parry-Jones, 1999; ADB, 2003
**** Illegal exports reported

APPENDIX G

FAO ad hoc Expert Advisory Panel Assessment Report: Mediterranean Date Mussel

PROPOSAL NO. 35

SPECIES: *Lithophaga lithophaga* - Mediterranean date mussel

PROPOSAL: Inclusion in Appendix II, in accordance with Article II, paragraph 2a.

****

ASSESSMENT SUMMARY: Proposal 35 contains a moderate amount of information on *Lithophaga lithophaga* biology, distribution, trade, and abundance. The Panel could not accurately determine the extent to which the species is exploited throughout its range, although it was clear that destructive fishing practices threaten the species at the local and perhaps national levels in certain parts of the Mediterranean Sea. A limited amount of new information, not contained in the original proposal, was presented to the Panel from the published literature and by an Expert Panel member. This included new data on growth and maturation rates, abundance time-series, and levels of research. However, none of this information significantly changed the Panel's opinions about the conservation status of the species.

The Panel considered that the proposal identified a real and important problem. On the basis of the available information, the Panel was of the opinion that the species is not presently at risk of extinction in the foreseeable future, as substantial portions of its range remain unexploited or lightly exploited (e.g., Turkey). It was noted, however, that there is little evidence that healthy, unexploited populations can provide new recruits/juveniles for exploited populations. Furthermore, if harvesting continues with the highly destructive practices currently in use, the species will probably be progressively extirpated and thus be at real risk of extinction in an unspecified distant future. Date mussels are protected by legislation and international conventions in most of the range States, but implementation of these instruments seems to be largely ineffective and illegal harvest and illegal trade continue. A portion of the illegal trade appears to occur between member states of the European Union, and thus would not be affected by a CITES Appendix-II listing.

PANEL COMMENTS

Biological Parameters

It was reported that *L. lithophaga* has faster growth rates than those described in the proposal. The species can reach a size of 8 cm shell length in approximately 14 years (Grubelic *et al* 2004)[6], and can reach sexual maturity in 4 years. These rates appear to vary geographically.

Distribution and Habitat Availability

The Panel discussed the relatively broad geographic distribution of the species, and noted new information that showed the species also occurred in the Bay of Biscay (northern Spain). The Panel highlighted the fact that the species requires limestone substrate for settlement and growth, within a particular depth range along coastlines. The Panel tried to ascertain what portion of the available habitat has been impacted by destructive harvest techniques. A panel member clarified that current extraction methods (hammer and chisel or explosives) completely destroy the limestone substrate required by the species, and that recolonization by date mussels after harvest has not been observed.

Harvest methods have a devastating effect on *L. lithophaga* habitat, and make the fishery unsustainable in the long-term. The habitat destruction involved in this fishery has a direct bearing on the species' conservation, coastal biodiversity, and the notion of sustainable harvest for international trade inherent in the CITES listing criteria.

Population status and trends

The Panel noted that date mussel density does not appear to change seasonally, as the proposal incorrectly states. Fanelli *et al*. (1994), as cited in the supporting statement, provided information on exploitation and consequent habitat damage in southeastern Italy. They surveyed 159 km of rocky coast in 1990 and 206 km of rocky cost in 1992. In 1990, 81 km (51%) was described as "damaged" and 44 km (28%) was classified as "heavily damaged". By 1992, 128 km (62%) was classified as "damaged" and 69 km (33%) was classified as "heavily damaged". A similar situation was noted by Simunovic and Grubelic (1992) for the eastern Adriatic coast. Fanelli *et al*. (1994) concluded that areas damaged by date mussel harvesting did not recover between surveys and that recolonization was unlikely, possibly due to sea urchin grazing of some areas. Through an examination of the proposal, and input from panel members, the Panel concluded that currently there is little exploitation of date mussels east of Greece (in the Mediterranean Sea) and that north African populations are largely unexploited.

The date mussel appeared to remain at low risk of global extinction in the foreseeable future. Local extirpations appear to be prevailing because of highly destructive harvest methods. The proposal could be enhanced by more extensive reference to salient literature and research

[6] Grubelic, I., A. Simunovic and M. Despelatovic. 2004. The date-shell *Lithophaga lithophaga* L. colonization of immersed rocks at the eastern part of the Adriatic Sea. *Rapp.Comm.int.Mer.Medit.*, **37**. p520.

findings (e.g., Fanneli *et al*., 1994; Grubelic *et al*., 2004; Simunovic *et al*., 1990[7]; Simunovic and Grubelic, 1992).

Threats

Harvesting for human consumption appeared to pose the greatest threat to the species' survival. This threat occurs largely because current harvest techniques destroy date mussel habitat and apparently make it unsuitable for the species to recolonize. Thus, sustainable fisheries for date mussels currently appear difficult or impossible. The Panel noted that existing national and regional prohibitions on harvest, sale, and trade in date mussels are poorly implemented.

The species is harvested for both domestic and international trade, although the relative importance of international trade in driving demand for date mussels is unclear.

Utilization and Trade

The species is banned from harvest, sale, or export in most range states where it is currently exploited. Illegally obtained specimens remain a high-value seafood commodity, at least in some European markets. The proposal outlines several illegal trade routes between Mediterranean countries, law enforcement actions against smugglers, and the common lack of customs controls over date mussel shipments (which are often coded as "molluscs" in trade data).

Conservation and Management

The species and its habitat are listed for protection under the following conservation agreements:

- Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) – Appendix II
- Convention for the Protection of the Mediterranean Sea against Pollution (Barcelona Convention) – Annex II
- Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (Habitat Directive) – Annex IV

These agreements stipulate strict prohibitions on the harvest, trade, or sale of listed species such as date mussels and mandate particular habitat protections. However, the Panel concluded that the regularly documented cases of illegal harvest and trade in a variety of countries indicate that these measures are not fully enforced.

Likely Effectiveness for Conservation

[7] Simunovic, A, I. Grubelic, M. Tudor and M. Hrs-Brenko. 1990. Sexual cycle and biometry of Date shell *Lithophaga lithophaga* Linnaeus (Mytilidae). *Acta Adriat.* **31**: 139-151.

The Panel concluded that the primary threat to date mussel survival is illegal harvest for human consumption. This threat is significant largely because current harvest practices destroy the limestone habitat upon which the species relies for growth and survival.

Although there are a number of national and international prohibitions on the harvest and trade in this species, current enforcement is questionable and the Panel considered the added benefit that might be conferred for date mussel conservation from a CITES Appendix-II listing. The presence of extensive harvest and trade prohibitions means that almost all international trade in date mussels is clandestine and involves smuggling specimens across national boundaries, indicating weaknesses in the customs' oversight. Therefore, the Panel could not see how CITES permitting regimes could be effectively applied. Given the current legal status of the species and trade patterns, the Panel could not ascertain any meaningful additional conservation benefit from a CITES Appendix-II listing.

EVALUATION AGAINST CITES LISTING CRITERIA

The criteria relevant to the proposals for an Appendix II listing considered by the Panel are those in Annex 2a in conjunction with the guidelines in Annex 5 of Resolution Conf. 9.24 (Rev. CoP12). However, a revision of this Resolution is currently underway. The draft version of the revision at the time of the Panel meeting (CITES document CoP13 Doc. 57) differs in a number of respects from Res. Conf. 9.24 (Rev. CoP12). Most importantly, for commercially-exploited aquatic species, it includes revisions in the wording of the Annex 2a criteria and the associated Annex 5 decline guidelines. Resolution Conf. 9.24 (Rev. CoP12) will be used for the next CoP meeting (CoP13). However, FAO considers the current revision (CoP13 Doc. 57) to be more appropriate for commercially-exploited aquatic species.

Panel assessment relative to Resolution Conf. 9.24 (Rev. CoP12):

Annex 2a:

"A species should be included in Appendix II when either of the following criteria [A or B] *is met."*

Annex 2a, criterion A: "It is known, inferred or projected that unless trade in the species is subject to strict regulation, it will meet at least one of the criteria listed in Annex 1 in the near future."

Panel evaluation: The Panel concluded that there was no evidence that harvest for international trade would cause date mussel to meet any of the Conf. 9.24, Annex 1, criteria in the near future.

Annex 2a, criterion B: "It is known, inferred or projected that the harvesting of specimens from the wild for international trade has, or may have, a detrimental impact on the species by either:

i) exceeding, over an extended period, the level that can be continued in perpetuity; or

ii) reducing it to a population level at which its survival would be threatened by other influences"

Panel evaluation: The Panel concluded that date mussels were probably not over-exploited as a result of international trade in a significant portion of their range.

Panel assessment relative to revised criteria incorporating FAO recommendations (CoP13 Doc. 57):

Annex 2a:

"A species should be included in Appendix II when, on the basis of available trade data and information on the status and trends of the wild population(s), at least one of the following criteria [A or B*] is met."*

Annex 2a, criterion A: "It is known, or can be inferred or projected, that the regulation of trade in the species is necessary to avoid it becoming eligible for inclusion in Appendix I in the near future."

Panel evaluation: See comments above for Annex 2a, criterion A in the current version of Res. Conf. 9.24.

Annex 2a, criterion B: "It is known, or can be inferred or projected, that regulation of trade in the species is required to ensure that the harvest of specimens from the wild is not reducing the wild population to a level at which its survival might be threatened by continued harvesting or other influences."

Panel evaluation: See comments above for Annex 2a, criterion B.

OVERALL CONCLUSIONS

The Panel considered that the proposal identifies a real and important problem. On the basis of the available information, the Panel was of the opinion that the species is not presently at risk of extinction in the foreseeable future, as substantial portions of its range remain unexploited or lightly exploited (e.g., Turkey). However if harvesting continues with the highly destructive practices currently in use, the species' habitat will be further degraded and date mussels will probably be progressively extirpated and placed at real risk of extinction in an unspecified distant future. Date mussels are protected by legislation and international conventions in most of the range States, but implementation of these instruments seems ineffective because illegal harvest and illegal trade continue.

A portion of the illegal trade appears to occur within or between member states of the European Union, and thus would not be affected by a CITES Appendix-II listing. Furthermore, the current international trade involves smuggling specimens across national boundaries with little or no customs oversight. Since CITES effectiveness often depends on

border interdiction and permit inspection, the Panel could not determine how a CITES listing could help to improve the existing illegal international trade problem (which relates to inadequate border controls). Furthermore, an Appendix-II listing (which monitors and permits international trade) would actually be less strict than existing measures, and the potential enforcement activities for a CITES listing would seem better applied to national and regional efforts to enforce existing trade and harvest bans.

APPENDIX H

FAO Ad Hoc Expert Advisory Panel Assessment Report: Corals

PROPOSAL NO.: 36

SPECIES: Corals - Helioporidae spp., Tubiporidae spp., Scleractinia spp., Milleporidae spp. and Stylasteridae spp.

PROPOSAL: Amendment of the annotation for Helioporidae spp., Tubiporidae spp., Scleractinia spp., Milleporidae spp. and Stylasteridae spp. to read

> Fossils, namely all categories of coral rock, except live rock (meaning pieces of coral rock to which are attached live specimens of invertebrate species and coralline algae not included in the Appendices and which are transported moist, but not in water, in crates) are not subject to the provisions of the Convention.

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OVERALL CONCLUSIONS

All hard corals are on Appendix II of CITES, and CITES Conf. Res. 11.10 differentiates between various forms of coral. Fossils are not included in the listing but coral rock, dead coral and live coral are covered. The proposed annotation would have the effect of including coral rock as "fossils" and thus excluding this from the listing. Under the annotation, live rock (as defined in the proposed annotation) would still be covered by the Appendix II listing. Live rock is typically dead coral substrate encrusted with algae and other non-CITES species. It can be cultured or taken from the wild.

The Panel recognised that there could be conservation issues with export of live rock (i.e. potential damage to live reefs) but was unable to determine the extent of the potential impact, as this is a complex question on which little information was available.

The Panel was informed (email from US CITES Authority to CITES Animals Committee Corals Working Group) that subsequent to the Animals Committee meeting which had accepted the proposed wording, implementation issues with the proposed definition of live rock had been raised. One of these issues involved shipping live rock dry, which would have the effect of classifying live rock as a "fossil", contrary to the intent of the proposed annotation. Another was the recent use of plastic bags rather than crates for shipment which again would exclude live rock from the annotation as written. A third issue was related to developing a consistent enforcement protocol, e.g. determining whether live rock was "moist" or "dry" or whether it was submerged or not.

The Panel recognised the complexity of defining coral parts and derivatives to support control of international trade and the considerable work that has been done within CITES on

this issue over the years. However, it was unable to evaluate the effectiveness of the proposed annotation, primarily due to the lack of appropriate law enforcement expertise on the Panel and lack of detailed information on trade practices in the ornamental coral industry.

The FAO Ad hoc Expert Advisory Panel for the Assessment of Proposals to Amend Appendices I and II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) Concerning Commercially-Exploited Aquatic Species was held at FAO headquarters from 13 to 16 July 2004. The Panel reviewed the proposals to the 13th Conference of the Parties to CITES (CoP-13) for listing or delisting commercially-exploited species. It considered four proposals dealing with *Carcharodon carcharias* (white shark), *Cheilinus undulatus* (humphead wrasse*) Lithophaga lithophaga* (Mediterranean date mussel) and *Helioporidae* spp., *Tubiporidae* spp., *Scleractinia* spp., *Milleporidae* spp. and *Stylasteridae* spp. (corals).

The task of the Panel was to: assess each proposal from a scientific perspective in accordance with the CITES biological listing criteria, taking account of the recommendations on the criteria made to CITES by FAO; and comment, as appropriate, on technical aspects of the proposal in relation to biology, ecology, trade and management issues, as well as, to the extent possible, the likely effectiveness for conservation