CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES
OF WILD FAUNA AND FLORA

Twelfth meeting of the Conference of the Parties
Santiago (Chile), 3-15 November 2002

Interpretation and implementation of the Convention

Amendment of the Appendices

CRITERIA FOR AMENDMENT OF APPENDICES I AND II

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FAO Fisheries Report No. 667
FAO, Rapport sur les pêches No 667
FAO, Informe de Pesca No 667 FIRM/R667(Tri)

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

Rapport de la

DEUXIÈME CONSULTATION TECHNIQUE SUR LA PERTINENCE DES CRITÈRES D'ÉTABLISSEMENT DE LA LISTE DES ESPÈCES AQUATIQUES FAISANT L'OBJET D'UNE EXPLOITATION COMMERCIALE AU TITRE DE LA CITES

Windhoek, Namibie, 22-25 octobre 2001

Informe de la

SEGUNDA CONSULTA TÉCNICA SOBRE LA IDONEIDAD DE LOS CRITERIOS DE LA CITES PARA LA LISTA DE ESPECIES ACUÁTICAS EXPLOTADAS COMERCIALMENTE

Windhoek, Namibia, 22-25 de octubre de 2001

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
ORGANISATION DES NATIONS UNIES POUR L'ALIMENTATION ET L'AGRICULTURE
ORGANIZACIÓN DE LAS NACIONES UNIDAS PARA LA AGRICULTURA Y LA ALIMENTACIÓN
Rome/Roma, 2002

PREPARATION OF THIS DOCUMENT

This is the final version of the report of the Second Technical Consultation on the Suitability of the CITES Criteria for Listing Commercially-exploited Aquatic Species, held in Windhoek, Namibia, from 22 to 25 October 2001.

PRÉPARATION DU DOCUMENT

Le présent document contient le rapport final de la deuxième Consultation technique sur la pertinence des critères d'établissement des listes d'espèces aquatiques faisant l'objet d'une exploitation commerciale au titre de la CITES tenue à Windhoek (Namibie) du 22 au 25 octobre 2001.

PREPARACIÓN DE ESTE DOCUMENTO

Esta es la versión final del informe de la segunda Consulta Técnica sobre la idoneidad de los criterios de la CITES para la lista de especies acuáticas explotadas comercialmente, Windhoek (Namibia), 22-25 de octubre de 2001.

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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.
Rapport de la deuxième Consultation technique sur la pertinence des critères d'établissement de la liste des espèces aquatiques faisant l'objet d'une exploitation commerciale au titre de la CITES. Windhoek, Namibie, 22-25 octobre 2001.
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FAO Fisheries Report/FAO Rapport sur les pêches/FAO Informe de Pesca. No. 667. Rome/Roma, FAO. 2002. 87p.

ABSTRACT

The Second Technical Consultation on the Suitability of the CITES Criteria for Listing Commercially-exploited Aquatic Species was held in Windhoek, Namibia, from 22 to 25 October 2001. It was attended by representatives from 23 Members of FAO and one non-Member Nation of FAO, by a representative from a specialized agency of the United Nations and by observers from six intergovernmental and international non-governmental organizations.

The primary task of the Consultation was to formulate a proposal on revision, as necessary, of the listing criteria, as well as on the process of revision and listing. In formulating its proposal, the Consultation reviewed a draft report prepared by the FAO Secretariat entitled "A Background Analysis and Framework for Evaluating the Status of Commercially-exploited Aquatic Species in a CITES Context". The Consultation generally supported the report but also made a number of comments on the Secretariat recommendations. These comments are included in the body of this report of the Consultation. The detailed proposal from the Consultation for consideration by the COFI Sub-Committee on Fish Trade for formal submission to CITES was written in the form of specific responses to CITES Notification to the Parties No. 2001/037 of 31 May 2001. This CITES Notification is a part of CITES own review process and lists proposals from the CITES Secretariat on possible revisions to the criteria. The Consultation's recommended response to the CITES proposals is included in this report as Appendix F.

In addition to detailed comments on the criteria, the Consultation arrived at other important conclusions and recommendations. It was emphasized that each proposal for a change to the Appendixes needs to be evaluated on a case-by-case basis, in accordance with the principle of using the best scientific information available. The need was also stressed for the existing process within CITES for scientific evaluation of proposals for listing, transfer and de-listing to be strengthened. This would involve more explicit involvement of fisheries agencies and regional fisheries management organizations, and should allow for a greater and formalized role for FAO. In addition, the Consultation emphasized the importance of the Agenda item proposed for the Eighth Session of the COFI Sub-Committee on Fish Trade "Developing a work plan for exploring CITES issues with respect to international fish trade" and proposed some issues which needed to be discussed under this item.

APPENDIX F

Recommended Comments on CITES Notification to the Parties No. 2001/037

BACKGROUND

1. The Second Technical Consultation on the Suitability of the CITES Criteria for Listing Commercially-exploited Aquatic Species was held in Windhoek, Namibia, from 22 to 25 October 2001. It considered the appropriateness of the existing CITES listing criteria, guidelines and process for resources exploited commercially by fisheries in marine and large freshwater bodies with particular emphasis on Appendix II. It concluded that several important improvements could be made to the existing criteria and process and that, in particular, quantitative guidelines could and should be developed. The specific conclusions related to the CITES criteria are included as the second part to this Appendix in the form of Comments On/ Amendments To the proposed criteria described in CITES Notification to the Parties No 2001/037 of 31 May 2001. It was agreed that the review should cover resources exploited by fisheries in marine and large freshwater bodies, in particular invertebrate and fish species. These resources are subsequently referred to in this Appendix as exploited fish species.

2. The Technical Consultation considered that, in general, taxonomic characteristics are less important to risk of extinction than life history characteristics and that the most important property of species and populations in relation to risk of extinction is their resilience. Based on current knowledge, this is best reflected by the productivity of the species, with more productive species generally being more resilient than less productive species. Productivity itself is defined as the maximum per capita growth rate of a population. Productivity is a complex function of fecundity, growth rates, natural mortality, generation time, age of maturity, and longevity.

3. With reference to the existing Appendix I (Annex 1) Criterion A, small population size, it is considered that the extent-of-decline of the population from its estimated historical or potential carrying capacity is a more useful measure of what constitutes a small population for most exploited species, because populations that are very low relative to the average carrying capacity may be susceptible to 'depensation'. Depensation is a negative effect on population growth that becomes proportionally greater as population size declines. Populations experiencing depensation are prone to further reductions in size, even in the absence of exploitation, and therefore have a greater risk of extinction. The CITES criteria and guidelines should be such that they identify species as being eligible for listing before they decline to an abundance at which there is a risk that depensatory effects would dominate.

4. Because there is no single absolute number that provides a good measure of risk of extinction for all exploited fish species, it **is recommended** that it is generally preferable to consider the size of a population in relation to a reference baseline; i.e. to consider the historical-extent-of-decline. Depending on the species under consideration, the reference baseline may relate to the average carrying capacity at some point in history, or to an appropriate or potential carrying capacity given alterations to the environment that have affected historical carrying capacity.

5. Recommendation

The current CITES guidelines for small absolute population size are appropriate for only a few exploited marine species, such as some sessile or semi-sessile species, some species with extremely low productivity, and some small endemic populations. Therefore in Annex 5 as applied to criterion A of

Annex 1, the definition of small population size should be changed, at least where applied to most exploited fish species, to place greatest emphasis on historical-extent-of-decline. As an historical-extent-of-decline guideline it is recommended that the range of 5-20% of the average carrying capacity (reference baseline), depending on species productivity, be used for most exploited fish species for consideration for listing on CITES Appendix I. The range 5-10% should be used for species with high productivity, 10-15% for species with medium productivity and 15-20% for species with low productivity. It is noted that the historical-extent-of-decline where listing should be considered may fall outside this range for some species.

6. The existing Annex 5 guidelines for Criterion B, area of distribution, are considered unlikely to be useful to protect exploited fish species, but may be applicable for certain reef fish and other completely or largely sessile species. Historical-extent-of-decline of the area of distribution should normally be used in preference to absolute measures for this Criterion.

7. Recommendation

The existing restricted area of distribution guideline of 10 000 km^2 is inappropriate (either too large or too small) for most exploited fish species. The historical-extent-of-decline in area of distribution should be used in preference. If no other suitable information is available and absolute area of distribution has to be used for an exploited fish population, analyses should be on a case-by-case basis as no numeric guideline is universally applicable.

8. Criterion C, the decline criterion, was considered to be the one likely to be employed most frequently for exploited fish species. Decline can be expressed in two fundamentally different ways: (i) the overall historical-extent-of-decline (see Paragraphs 4 and 5) and (ii) the recent-rate-of-decline. It is recommended that these two should be considered together. The greater the historical-extent-of-decline, the greater the concern associated with a given recentrate-of-decline.

9. 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 Appendix I guidelines within approximately a 10-year period, otherwise the overall extent-of-decline is what is important. Given that consideration for Appendix I listing at the proposed 5% - 20% historical-extent-of-decline is more precautionary than the existing guideline of 5 000 individuals, a separate Appendix I criterion for rate-of-decline is not considered necessary. However, rate-of-decline could be considered as a surrogate for historical-extent-of-decline when a baseline population size cannot be estimated. It may also be useful as an indicator of the urgency of the need for remedial action.

10. Recommendation

The rate-of-decline that is projected to continue and lead the species to decline from its current extent-of-decline to the Appendix I extent-of-decline guideline within 10-years ***is recommended*** *as a guideline for consideration of listing on Appendix II. If this recent-rate-of-decline was met or exceeded and projected to continue, it would lead to consideration for an Appendix II listing. However, listing should not normally be considered if the present estimated historical-extent-of-decline is above 50% of baseline, since exploited fish species at such extent-of-decline would not usually constitute any cause for immediate concern, unless the rate of decline is very high. When sufficient data are available, the recent rate of decline should be calculated over a 10-year period. If fewer data are available, annual rates over a shorter period could be used. If there is evidence of a change in the direction in the trend,*

greater weight should be given to the more recent consistent trend. In most cases, listing would only be considered if the decline is projected to continue.

11. Recommendation

Even if a population is not declining appreciably, it could be considered for listing on Appendix II if it is near the extent-of-decline guidelines recommended above for consideration for Appendix I listing. A range of between 5% and 10% above the relevant extent-of-decline guideline for Appendix I listing might be considered as appropriate for such a buffer zone. [Introduction of this concept into the criteria for an Appendix II listing has the additional advantage of providing a framework within which transfer from Appendix I to Appendix II, and de-listing from Appendix II can be considered.]

12. In all cases the guidelines should be used in close conjunction with consideration of the relevant modifying factors that may be taxon or case specific. Such factors may increase or decrease the risks to the species, and may therefore necessitate appropriate modification to any percentages or rates suggested in these guidelines. A few examples of modifying factors include: life history characteristics (e.g. fecundity, growth rate, age at first maturity); absolute numbers or biomass; selectivity of removals and many others. The wide range of potential taxon-associated modifying factors supports the contention that there is no escaping the need to consider each population on a case-by-case basis, and for a rigorous and, whenever possible, quantitative scientific evaluation to refine the estimate of threat of extinction on a case-by-case basis.

13. The Second Technical Consultation emphazised that each proposal for a change to the Appendices needs to be evaluated on a case-by-case basis. The principle of using the best scientific information available is fundamental to assessing the status of any population being considered for listing, transfer between Appendices or de-listing. This principle is affirmed in the UN Convention on the Law of the Sea of 1982 (Article 61) and the FAO Code of Conduct for Responsible Fisheries (Article 6.4), which call for the use of the best scientific evidence available when making conservation and management decisions. In fisheries, as in any population assessment, quantitative methods will normally be used to integrate as much as possible of the available relevant data and analyses to obtain the best estimates of indicators such as population size over time, mortality rates and production rates. Therefore, typically, an assessment will generate estimates of relevance to more than one of the CITES criteria and guidelines (population size, extent-of-decline, rate-of-decline (or change) and impact of harvesting).

14. Recommendation

When sufficient data are available to allow reliable quantitative assessments to be conducted, the results from these should be used as the primary approach for interpreting the criteria and assessing the extinction risk on a case-by-case basis. Even in data-poor situations, appropriate quantitative analyses should be used to the extent possible to ensure that indices of population status are as accurate and precise as possible. In cases where few or no quantitative data exist, qualitative information, analogies with other species and consideration of the modifying factors should be used in combination to develop an informed judgement about the likely status of a population, on a case by case basis, with respect to the suggested criteria and guidelines.

Related matters

15. Recommendation

CITES should strengthen its existing process for scientific evaluation of proposals as there is little scope at present to resolve any conflicting views and because such strengthening will better ensure that decisions on amendments to the Appendices are informed by objective, transparent and balanced evaluations of the status of each population, on a case by case basis, in relation to the biological criteria and guidelines. FAO can perform an important coordinating function in this process through its relationships with the regional fisheries management organizations (RFMOs). The Technical Consultation recommends that a Memorandum of Understanding or other mechanism should be developed between CITES and FAO to facilitate communication and in-depth evaluation by relevant experts on a case-by-case basis. Such a Memorandum should be endorsed by the appropriate governing body at both Organizations.

Comments On/Amendments To Annex to CITES Notification 2001/037 (FI:SLC2/2001/Inf.5) and Related Matters

Where no comment is made, this does not imply either endorsement or objection.

Page 2. First "RESOLVES that…measures that are proportionate to the anticipated risks to the species;"

The Second FAO Technical Consultation noted that in making this change, CITES has taken up the recommendation made by FAO in the report of the first Technical Consultation on the Suitability of the CITES Criteria for Listing Commercially-exploited Aquatic Species.

Several delegations supported this change and further suggested that this wording could be repeated in other appropriate sections, for example Annex 4.

Page 4, "ENCOURAGES Parties….to include a quantitative evaluation.." The Technical Consultation supported the inclusion of this paragraph on quantitative evaluations.

Annex 1

Biological criteria for Appendix I

Text added: '<u>or other modifying factors as appropriate</u>;' to A iii, B v, and C ii:

New A iii) a high vulnerability due to the species' biology, behaviour (including migration), '<u>or other modifying factors as appropriate</u>;' or

New B v) a high vulnerability due to the species' biology, behaviour (including migration), '<u>or other modifying factors as appropriate</u>'.

New C ii), add final bullet point: '<u>- other modifying factors as appropriate</u>.'

The Second Technical Consultation supported the rationale behind the deletion of D.

Annex 2a

Criteria for the inclusion of species in Appendix II in accordance with Article II, paragraph 2(a)

The following is suggested as text to replace the existing.
"A species should be included on Appendix II when, on the basis of available information on or indicating the status and trends or exploitation of the wild populations, one of the following criteria is met:

A. It is known, 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;
B. It is known or inferred that the species, whether declining or not, is sufficiently near to meeting the criteria for inclusion in Appendix I that the application of a precautionary approach warrants regulation of trade;
C. It is known, 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 populations to a level at which their survival is threatened by other factors."

Annex 2b

Criteria for the inclusion of species in Appendix II in accordance with Article II, paragraph 2(b)

Changes from 'should' to 'may' in the introductory sentence were supported by the Second FAO Technical Consultation, because of the difficulties to which this clause could give rise for processed fish products.

Annex 3

Special cases

This Annex was not reviewed by the Second FAO Technical Consultation, but it recommended that it should be considered at the COFI Sub-Committee on Fish Trade meeting in Bremen in February 2002.

Annex 4

Precautionary measures

The Second FAO Technical Consultation did not specifically discuss this Annex but noted that these changes (deleting the first paragraph, which is now covered by the other text in the operational part of this document) was as requested by FAO in the first Technical Consultation on the CITES Listing Criteria.

Annex 5

Definitions, **explanations and** guidelines ~~and notes~~

Changes recommended in this Annex will require consequential changes to Annex 6 and may also require changes to Annexes 1 and 2.

Species

The Second FAO Technical Consultation was pleased to note that the insertions to this section clarify that CITES listings can apply to individual fisheries stocks.

The following is suggested as text to insert:

"A unit stock in fisheries can be defined as all the individuals of fish in an area, which are part of the same reproductive process. It is self-contained, with no emigration or immigration of individuals from or to the stock. On practical grounds, however, a fraction of the unit stock is considered a "stock" for management purposes (or a management unit), as long as the results of the assessments and management remain close enough to what they would be for the unit stock."

Area of distribution

The Second FAO Technical Consultation agreed that this guideline is of only limited use. The Consultation recommends that the existing restricted area of distribution guideline of 10 000 km² is inappropriate (either too large or too small) for most exploited fish species. The historical-extent-of-decline in area of distribution should be used in preference. If no other suitable information is available and absolute area of distribution has to be used for an exploited fish population, analyses should be on a case-by-case basis as no numeric guideline is universally applicable.

Decline

It is recommended that the existing text under this heading is replaced as follows. Text shown in bold is taken from the existing text in this section of the Annex to the Notification 2001/037.

[First two undeleted paragraphs, reproduced below, remain the same, except substitute "productivity" for "biology" and insert sub-heading "Appendix I"]

A decline is a reduction in the abundance or area of distribution of a species. Decline can be expressed in two different ways: (i) the overall long-term extent of decline or (ii) the recent rate of decline. The long-term extent of decline is the total estimated or inferred percentage reduction from a baseline level of abundance or area of distribution. The recent rate of decline is the percentage change in abundance or area of distribution over a recent time period. The estimated or inferred baseline for extent of decline should extend as far back into history as possible.

Appendix I

A general guideline for a marked historical extent of decline is a percentage decline to 5%-30% of the baseline, depending on the productivity ~~**biology**~~ **of the species. The extremes of 5% and 30% will be applicable to only a relatively small number of species, but some species may even fall outside of these extremes.**

[Add to second paragraph, above]:

For resources exploited by fisheries in marine and large freshwater bodies, a narrower range of 5-20% is deemed to be more appropriate in most cases, with a range of 5-10% being applicable for species with high productivity, 10-15% for species with medium productivity and 15-20% for species with low productivity. Nevertheless some species may fall outside this range.

In general, historical extent of decline should be the primary criterion for consideration of listing on Appendix I. However, in circumstances where information to estimate extent-of-decline is limited, rate-of-decline over a recent period could itself still provide some information on extent-of-decline.

[Delete third paragraph, beginning "A general guideline for a marked recent rate…"]

[Insert subheading "Appendix II" and add to the beginning and end of the 4th paragraph, as suggested below]:

Appendix II

For listing on Appendix II, **the historical extent of decline and the recent rate of decline should be considered in conjunction with one another. A given recent rate of decline is of greater concern the higher the historical extent of decline**, and the lower the productivity of the species**.**

[Add to end of 4th paragraph]:

A general guideline for a marked recent rate of decline is the rate of decline that would drive a population down within approximately a 10-year period from the current population level to the historical extent of decline guideline (i.e. 5-20% of baseline for exploited fish species). There should rarely be a need for concern for populations that exhibit an historical extent of decline of less than 50%, unless the recent rate of decline has been extremely high. The following table presents the cumulative 10-year rates of decline (and corresponding average annual rates of decline) that would drive a population down from the current historical extent of decline to one of several potential historical extent of decline guidelines that could trigger consideration of listing on Appendix I, depending on the productivity of the species.

Current population as % of baseline	**Historical extent of decline that could trigger consideration of listing on Appendix I**			
	20%	**15%**	**10%**	**5%**
100%	80% (15%)	85% (17%)	90% (21%)	95% (26%)
90%	78% (14%)	83% (16%)	89% (20%)	94% (25%)
80%	75% (13%)	81% (15%)	88% (19%)	94% (24%)
70%	71% (12%)	79% (14%)	86% (18%)	93% (23%)
60%	67% (10%)	75% (13%)	83% (16%)	92% (22%)
50%	60% (9%)	70% (11%)	80% (15%)	90% (21%)
40%	50% (7%)	63% (9%)	75% (13%)	88% (19%)
30%	33% (4%)	50% (7%)	67% (10%)	83% (16%)
20%	0%	25% (3%)	50% (7%)	75% (13%)
15%	0%	0%	33% (4%)	67% (10%)
10%	0%	0%	0%	50% (7%)
5%	0%	0%	0%	0%

Values of average annual rates of decline are set to zero in the table once the population is at or below the extent-of-decline guideline because once a population has fallen to the suggested Appendix I guideline, a decline need not necessarily still be occurring for listing to be considered.

Even if a population is not declining appreciably, it could be considered for listing on Appendix II if it is near the extent-of-decline guidelines recommended 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.

In estimating or inferring the historical extent-of-decline or the recent rate-of-decline, all relevant data should be taken into account. 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, otherwise the overall extent-of-decline is what is important. When sufficient data are available, the recent rate-of-decline should be calculated over approximately a 10-year period. If fewer data are available, annual rates over a shorter period could be used. If there is evidence of a change in the direction in the trend, greater weight should be given to the more recent consistent trend. In most cases, listing would only be considered if the decline is projected to continue. N**atural fluctuations should not normally count as part of a decline~~, but~~**; nevertheless, **an observed decline should not be considered part of a natural fluctuation unless there is evidence for this. A decline that is the result of a harvesting programme that reduces the population to a planned level, not detrimental to the survival of the species, is not covered by the term "decline".**

Comment: If the concepts put forward in the preceding paragraphs are accepted, the last sentence of the paragraph immediately above might be considered for deletion, as its intent would already have been covered. However, if these concepts are not accepted, this sentence must definitely be maintained.

Extended period

Redundant if the original text of Annex 2a Bi is to be deleted.

Fluctuations

The Second FAO Technical Consultation recognizes the importance of taking fluctuations in population sizes or area of distribution into account in evaluating population status with respect to criteria and guidelines and of making adequate allowance for the natural fluctuations that occur in fish populations. There was inadequate time at the Consultation to discuss the specifics of the proposed definition but the Consultation nevertheless was appreciative of the advance made by CITES on this matter.

The following is suggested as a new definition to be inserted in Annex 5.

"Modifying factors

There are a number of taxon- or case-specific biological and other factors that are likely to affect the extinction risk associated with a given percentage decline, small population size or restricted area of distribution. Such factors may either increase the vulnerability to extinction, or mitigate extinction risk. Therefore, they may necessitate appropriate modification to any percentages or rates used as guidelines to trigger consideration of listing on the Appendices. Potentially relevant modifying factors include, but are not limited to, the following:

- Life history characteristics (e.g. fecundity, growth rate, age at first maturity);
- Absolute numbers or biomass;
- Selectivity of removals;
- Age, size or stage structure of a population;
- Social structure (e.g. sex ratio, social hierarchy, social dominance etc.);
- Density (particularly for sessile or semi-sessile species);

- Vulnerability at different life stages (e.g. during migration or spawning);
- Specialised niche requirements (e.g. diet and habitat);
- Species associations such as symbiosis and other forms of co-dependency;
- Aggregating behaviour (e.g. schooling);
- Fragmentation or concentration in one location;
- Genetic diversity;
- Trends in or extent of habitat loss or gain;
- Degree of endemism;
- Vulnerability to disease;
- Presence of invasive species;
- Rapid environmental change (e.g. shifts in ecological or climatic regimes);
- Existence of natural refugia;
- Adaptations to small population size;
- Degree of uncertainty;
- Vulnerability to depensation.

The wide range of potential taxon- or case-specific modifying factors emphasizes the fact that there is no escaping the need to consider each population on a case-by-case basis."

[Note: it is suggested that the CITES Secretariat, with assistance from the FAO Secretariat, may wish to define or explain some or all of these terms, particularly technical terms, including the reasons that they increase vulnerability or mitigate risk of extinction.]

Near Future

The Second FAO Technical Consultation recommended this definition be simplified to: "Near future is considered to refer to a period of approximately 10-years".

Population issues

Population
In line one, change 'the total number of' to 'all the'.

Population size
The Second Technical Consultation considered that the definition of population size could be considerably shortened and simplified. Keeping the first sentence of the current definition, the following sentence could replace the rest of the definition: "Effective population size refers to the component of the population that is likely to contribute genes to the succeeding reproducing generation."

Small wild population and **Very small Sub population**
The Second Technical Consultation commented that these guidelines were not applicable for most exploited fish populations, where the number of individuals associated with the risk of extinction could range from less than 1 000 (e.g. some low productivity species of reef fish) to at least 1 000 000 (e.g. some high productivity species of small pelagics), depending on the productivity and life history strategy of the species. It recommended that the current CITES guidelines for small absolute population size are appropriate for only a few exploited marine species, such as some sessile or semi-sessile species, some species with extremely low productivity, and some small endemic populations. Therefore in Annex 5 as applied to criterion A of Annex 1, the definition of small population size should be

changed, at least where applied to most exploited fish species, to place greatest emphasis on historical-extent-of-decline.

The following is suggested as a new definition to be inserted in Annex 5.

"Productivity

The ability to rebound from low population size is closely allied to the concept of the ability to sustain exploitation, both of which are referred to as population resilience. However, resilience is difficult to measure and so population productivity is commonly used as a measurable surrogate for population resilience. Productivity itself is defined as the maximum per capita growth rate of a population. As such, it is a complex function of fecundity, individual growth rates, natural mortality, age of maturity, and longevity. More productive species tend to have high fecundity, rapid individual growth rates, and high turnover of generations. They are likely to have greater ability to rebound from low numbers because they can quickly take advantage of conditions suitable for re-establishment or re-colonisation. But they will also have higher recruitment variability and fewer mature year classes in the spawning stock, therefore increasing the risk of fluctuating to low population sizes even in the absence of exploitation. In contrast, species with low productivity will tend to spend longer periods at low population sizes once they have been depleted.

In many cases, it may be appropriate to equate the generic term, "productivity" with indices of productivity such as generation time (or, more accurately, some function of the inverse of generation time)."

The following is suggested as a new definition to be inserted in Annex 5.

"Quantitative Evaluation

A numerical analysis that integrates as much of the available relevant data as possible to obtain the best estimates of indicators such as population size over time (e.g. a fisheries stock assessment). When sufficient data are available to allow reliable quantitative assessments to be conducted, the results from these should be used as the primary approach to interpret the criteria and assess the extinction risk. Even in data-poor situations, appropriate quantitative analyses should be used to the extent possible to ensure that indices of population status are as accurate and precise as possible. In cases where few or no quantitative data exist, qualitative information, analogies with other species and consideration of the modifying factors should be used in combination to develop an informed judgement about the likely status of a population with respect to the suggested criteria and guidelines."

The following is suggested as a new definition to replace the first sentence of the existing definition of 'vulnerability'.

"Vulnerability

Vulnerability is defined as being susceptible to harmful effects, and vulnerability factors as used here are those which increase the risk of extinction. Modifying factors that increase vulnerability will often be taxon- or case-specific."

Annex 6

Format for proposals to amend the Appendices

This Annex was not reviewed in detail by the Second FAO Technical Consultation. It will need to be reassessed in light of changes suggested, particularly to Annex 5.