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

Fourteenth meeting of the Plants Committee
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REVIEW OF RESOLUTION CONF. 9.24 (REV. COP12) – SYNTHESIS OF TEST OF APPLICABILITY OF CRITERIA FOR SELECTED PLANT TAXA

1. This document has been prepared by representatives of the Plants Committee to facilitate the discussion on the proposed revision of Resolution Conf. 9.24 (Rev. CoP12) (CoP12 Com. I 3) [Decision 12.97].

2. The synthesis is based on the tests of applicability of the criteria using individual plant taxa (see document PC14 Doc.6.1).

SYNTHESIS

Greg Leach

Representative of Oceania

Trade Criterion "Is or may be affected by trade"

Criterion

The trade criterion is described in the second RESOLVES of document CoP 12 Com I.3 as:

"RESOLVES that, when considering proposals to amend Appendices I and II, the following applies:

a) species that are or may be affected by trade should be included in Appendix I in accordance with Article II, paragraph 1, if they meet at least one of the biological criteria listed in Annex 1;"

"Affected by trade" is then defined in Annex 5 as follows:

A species "is or may be affected by trade" if:

1. it is known to be in trade, and that trade has or may have a detrimental impact on the status of the species; or

2. it is suspected to be in trade, or there is potential international demand for the species, that may be detrimental to its survival in the wild.

Review Summary

Twenty plant taxa have been selected for the review process. However, it should be noted that as some reviewers were involved in more than one taxon there are not necessarily twenty different independent reviews of the applicability of this criterion. The following analysis is based on the findings from the different taxa. For 15 species the reviewers had no problem with applying this criterion. Under two species (*Aloe* and *Prunus*) the reviewers made no comment at all about this criterion. Under the two Cacti examples, the reviewers have made a suggestion for amplifying the definition of "is or may be affected by trade" in Annex 5. The reviewer of *Zamia* suggested that the criterion needed to be more specific to distinguish the situation where there has been past wild-harvested trade but that this has now ceased altogether or been replaced by artificially propagated material.

In 5 species assessments, reviewers suggested that the word "trade" should be prefaced by the word "international". Although not necessarily causing a problem with applicability of the criteria, these reviewers obviously felt such an addition provided further clarity.

Some reviewers provided additional comments that did not relate to the applicability of this particular criterion but related to other criteria.

Review Recommendations

There are 3 aspects highlighted by reviewers that need analysis:

i) clarification of "trade" as "international trade"
ii) the amplified definition of "affected by trade"
iii) the distinction of past wild harvested trade from current trade

i) Clarification of "trade" as "international trade"

This item has been raised in previous Criteria working group meetings and in the joint AC/PC meeting at Shepherdstown. The word "international" has been variously included or deleted through different draft

versions of the criteria. Essentially, CITES is only about international trade. If the trade is only domestic then CITES has no mandate to regulate this trade and there would be no support for, or indeed any advantage in listing such a species. The argument for not including the word "international" is that it is redundant. The argument for including it is presumably that it serves as a reminder and that there is no real harm in having some redundancy in the text.

To reinforce the circularity of this particular discussion, an excerpt from the proceedings of the joint AC/PC meeting in Shepherdstown, USA, December 2000, is provided.

"The Regional Representative of Central and South America and the Caribbean (PC) asked why the words 'international trade' had been introduced to the subparagraphs when CITES was all about international trade. The Chairman (Mrs Clemente) noted this comment to be addressed during the editorial process for the final report."

Recommendation 1: Inclusion of "international " is redundant and therefore not necessary.

ii) Amplified definition of "affected by trade"

The reviewers provided the following amended definition with the changes shown in bold.

A species "is or may be affected by **international** trade" if:

1. it is known to be in **international** trade, and that trade has or may have a detrimental impact on the status of the species; or

2. it is suspected to be in **international** trade, or there is potential international demand for the species **on the basis of some evidence**, that may be detrimental to its survival in the wild.

3. **It is known that the species was subject to international trade in the past and therefore there is a potential for the international trade to be reinitiated.**

The insertion of "on the basis of some evidence" in point 2 is considered a redundant phrase. Any argument utilising potential international demand will need supporting evidence before being accepted by Parties. Annex 6 should also be consulted with this point. The opening paragraph of Annex 6 explicitly asks proponents to provide sufficient detail on proposals to allow the CoP to judge the proposal against the criteria. Paragraph 6.5 in Annex 6 also reinforces that discussion of the importance of current and/or future exploitation for international trade should be provided. If the language is considered not sufficiently explicit in requiring supporting evidence, then insertion of the word "demonstrable" before potential may strengthen this requirement.

Recommendation 2: No change to point 2 ***OR*** insert "demonstrable" before "potential"

The new point 3 explicitly clarifies that past international trade is a valid basis to demonstrate ongoing potential for international trade to resume. It could be suggested that this aspect is already covered under point 2. The reviewers perhaps consider that the current point 2 only covers potential demand that is estimated from future predictions. "Potential international demand" can be can be predicted by looking at current trends in trade, by projecting future demands based on likely market scenarios OR by examining past trade. The new point 3 is therefore considered to be already covered under point 2 and is redundant unless Parties feel there is a need to explicitly spell this out.

Recommendation 3: The new additional point 3 is redundant.

iii) Distinction of past wild harvested trade

The reviewer of *Zamia* made the following comment:

"This criterion needs to be more specific. *Z. furfuracea* was heavily traded in the 1970s but trade is now entirely in cultivated plants. The question needs to make this explicit. In terms of current trade, the answer should be NO, but evaluators may be tempted to say YES because trade WAS so heavy."

This comment may be an outcome of the abbreviated form of the criterion that was used in the table for reviewers i.e. "Is or may the species be affected by trade". Certainly if this is all the text that was used to assess the taxon in question there would be ambiguity. However, the review should consider the full wording of the relevant "RESOLVES" and this must be read in conjunction with the definition provided in Annex 5. The definition clearly states that the trade must have, actually or potentially, a detrimental effect on the species in the wild. Sub paragraph e) under this "RESOLVES" also provides some guidance on this issue.

e) species of which all specimens in trade have been bred in captivity or artificially propagated should not be included in the Appendices if there is negligible probability of trade taking place in specimens of wild origin;

When all the relevant text is taken into consideration there is adequate guidance to deal with shifts in trade from wild harvested material to artificially propagated.

The review of *Tillandsia* made a related comment that there was earlier extensive trade in wild harvested plants but the current trade is largely in artificially propagated material. However, wild plants still provide some parental stock for artificial propagation. The reviewers nevertheless still considered the criterion to be good and applicable.

Recommendation 4: The criterion is specific when all the relevant text is taken into consideration. No change required.

Comments not related to the applicability of the criterion.

In the example of *Panax*, the reviewer of raised the complexity of semi-wild production systems and the resultant impact on wild populations with the masking of wild sub-populations. There was no suggestion that this situation necessitated any change in the trade criterion. It is an issue that requires consideration under different types of production systems and perhaps in the definition of sub-populations.

In relation to the discussion on the inclusion of the word "international" prefacing trade, the reviewer of *Pseudophoenix* suggested that while CITES is about international trade, domestic trade could be an issue that is considered as a factor in the context of other criteria such as decline and vulnerability.

SYNTHESIS

Patricia Dávila Aranda

North America Representative

Appendix I: Criterion: A) The wild population is small, and is characterized by at least one of the following (see definitions below):

Relevant definitions for this criterion that were analysed

Population.- Population refers to the total number of individuals of the species (as "species" is defined in Article I of the Convention) and in this Annex (to be considered in light of any decision arising from consideration of Doc. 12.59).

Population size.- When providing details on the size of a population or sub-population, it should be made clear whether the information presented relates to an estimate of the total number of individuals or to the effective population size (i.e., individuals capable of reproduction, excluding individuals that are environmentally and behaviourally or otherwise reproductively suppressed in the wild) or to another appropriate measure or component of the population.

In the case of species biologically dependent on other species for all or part of their life cycles, biologically appropriate values for the host or co-dependent species should be chosen.

Small wild population.- For some species where data exists to make an estimate, a figure of less than 5,000 individuals has been found to be an appropriate guideline (not a threshold) of what constitutes a small wild population. However, this figure is presented only as an example since it is impossible to give numerical values that are applicable to all taxa. There would be many cases where these numerical guideline does not apply.

Review summary

Based on the findings for the 20 selected plant species, the following remarks can be made:

- In relation to the applicability of the criterion, thirteen (13) reviews consider that the criterion does apply for the species, four did not clearly specify whether the criterion applies or not, and three (3) did not answer at all.
- For five species the reviewers highlighted the need to have reference information within its own taxonomic group to define a small wild population. This information can be numerical, biological or geographical.
- Five reviews consider that the definition of small wild population is difficult to interpret and 3 of them suggest to include a definition of wild population.
- Five reviews suggested to avoid the use of numerical guidelines, because they can be misleading.
- Four reviews argued that there are not enough numerical data for some plant species in order to apply this criterion.
- Three reviews pointed out the importance to link the level of exploitation and the availability of individuals (population size) in defining the size of the population.
- Regarding the recommendation to specify whether the population number refers to the total or effective population size, there are three observations: two reviews indicate that this concept is generally not applicable for plant species, while another proposed to include this recommendation in the question concerning this criterion.

Review recommendations:

There are three aspects highlighted by reviewers that need analysis:

i) The need to have a definition of wild population.

Although wild population is a main concept referred along the amendment criteria, a definition is lacking.

A single definition was proposed:

Wild population.- wild population refers to the total number of individuals of the species **within its natural distribution area**.

ii) The amplified definition of small wild population.

Most of the reviews pointed out some problems when applying the small wild population definition, either by considering it as ambiguous, confusing or difficult to interpret. Some of them also noted that the use of absolute numbers as guidelines can be misleading and some others highlighted the need to have reference information (numerical, biological or geographical) within its own taxonomic group to define a small wild population. Finally, some indicated the importance to link the level of exploitation and the availability of individuals (population size) in defining the size of the population.

iii) The appropriateness of including within the definition recommendations the of total and effective population size. The information dealing with the total number of individuals or to the effective population size

Recommendations:

i) Include a definition of wild population.

ii) There is a need o f an amplified definition of small wild population that takes into account reference information (not absolute numbers) as stated above and to consider the need to link the definition to availability and levels of exploitation.

iii) Although there is not always information regarding whether the population numbers refer to total or effective population size, current definition allows the use of this information (detailed) when available and so there is no need to modify it.

* *

A) (i) an observed, inferred or projected decline in the number of individuals or the area and quality of habitat

Relevant definitions for this sub-criterion

Area of distribution.- Area of distribution of a species is defined as the area contained within the shortest continuous imaginary boundary which can be drawn to encompass all the known, inferred or projected sites of occurrence, excluding cases of vagrancy and introductions outside its natural range (though inferring and projecting area of occurrence should be undertaken carefully, and in a precautionary manner). The area within the imaginary boundary should, however, exclude significant areas where the species does not occur, and so in defining an area of distribution, account should be taken of discontinuities or disjunctions in the spatial distribution of species. For migratory species, the area of distribution is the smallest area essential at any stage for the survival of that species (e.g., colonial nesting sites, feeding sites for migratory taxa, etc.). For some species for which data were available to make an estimate, a figure of less than 10,000 km^2 has been found to be an appropriate guideline (not a threshold) of what constitutes a restricted area of distribution. However, this figure is presented only as an example, since it is impossible to give numerical values that are applicable to all taxa. There will be many cases where this numerical guideline does not apply.

Decline.- 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 data used to estimate or infer a baseline for extent of decline should extend as far back into the past as possible.

A general guideline for a marked historical extent of decline is a percentage decline to 5%-30% of the baseline, depending on the reproductive 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. However, both these figures are presented only as examples, since it is impossible to give numerical values that are applicable to all taxa because of differences in their biology (*see footnote with respect to application of decline to commercially exploited aquatic species).

A general guideline for a marked recent rate of decline is a percentage decline of 50% or more in the last 10 years or three generations, whichever is the longer. If the population is small, a percentage decline of 20% or more in the last 5 years or 2 generations (whichever is the longer) may be more appropriate. However, these figures are presented only as examples, since it is impossible to give numerical values that are applicable to all taxa because of differences in their biology.

The historical extent of decline and the recent rate of decline should be considered in conjunction with one another. In general, the higher the historical extent of decline, and the lower the productivity of the species, the more important a given recent rate of decline is.

In estimating or inferring the historical extent of decline or the recent rate of decline, all relevant data should be taken into account. A decline need not necessarily be ongoing. If data are available only for a short period and the extent or rate of decline based on these data are cause for concern, the guidelines above (extrapolated as necessary or relevant) should still apply. However, natural fluctuations should not normally count as part of a decline, but an observed decline should not necessarily be considered part of a natural fluctuation unless there is evidence for this. A decline that is the result of legal activities carried out pursuant to 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".

Review summary

Based on the findings for the 20 selected plant species, the following remarks can be made:

- Thirteen reviews point out that the sub-criterion can be applied, although some additional comments are made suggesting some problems or concerns in applying it. Three reviews said that the sub-criterion does not apply to their species. Three reviewers did not answer at all and four did not clearly specify whether the sub-criterion applies or not.

- Among some of the concerns pointed out by the reviewers that claimed that the sub-criterion can be applied are: 1) the need to have a time-line in the past to asses a population decline; 2) the need to know the length of the decline or its periodicity; 3) the need to define the terms "inferred" and "projected"; 4) the fact that the observed decline can be seen only, if there is a good knowledge of the population development. In contrast, the inferred or projected decline can

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* Application of decline for commercially exploited aquatic species:

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 in 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.

For listing in Appendix II, the historical extent of decline and the recent rate of decline should be considered in conjunction with one another. The higher the historical extent of decline, and the lower the productivity of the species, the more important a given recent rate of decline is.

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 have exhibited an historical extent of decline of less than 50%, unless the recent rate of decline has been extremely high.

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 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'.

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 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.

be known only, if information about trade development is available; 5) the need to have populations and habitat information for applying this sub-criterion; 6) the fact that area of distribution and habitat quality are also included in Criterion B; 7) the fact that the harvest and over-harvest rates of plants are usually unknown; 8) the clarification regarding the inclusion of "population declines" due to natural phenomena; 9) the risk to use only numerical data for assessing this sub-criterion, due to the fact that a population decline can be species-dependent, which obviously has a biological context.

- Among the remarks made by the reviewers (all working with trees) that claimed that the sub-criterion cannot be applied to their species are: 1) this sub-criterion is not applicable in those species that have almost exclusively asexual reproduction strategies. This is the case of many temperate and boreal trees that usually form clones extending over, in which we can see many individuals belonging to the same root system. Consequently, all the individuals originate from a single seedling. In this case, it is necessary to have a definition of individual among clones, using a genetic measure; 2) in these tree species, the interpretation of area and habitat quality decline is problematic, because normally they go through cyclic periods of them.; 3) the only way that this sub-criterion can be used is the inclusion of some other attributes, such as: a) landscape scale parameters; b) the understanding of the normal periodical cycles that they go through; 3) the numerical guidelines that are used, do not cover the average life generational time that these trees present.

Review recommendations:

Although there were many concerns regarding this sub-criterion (see above), many of them (availability of populations, area of distribution and habitat quality information; harvest and over-harvest rates knowledge) are obviously needed to apply it. Others, such as asexual reproductive strategies of some tree species are clear examples of cases in which this sub-criterion cannot be applied. However, due to the fact that 13 reviews said that the sub-criterion can be applied, we recognize four aspects highlighted by reviewers that need analysis:

i) <u>the need to define "inferred" and "projected" decline;</u>

Although these two terms are used in the explanation of the sub-criterion, their definition is missing.

Recommendation 1: On the basis that these two terms are central in the understanding of this sub-criterion and its application, it is necessary to elaborate clear definitions of them.

ii) <u>the need to define the time-line in the past to assess a population decline.</u>

Evidently, the ideal situation will be to have enough information to go back to the point when population decline started. However, in reality the available information for each species concerning their populations decline is variable and there is no way that we can set up a time limit that can be used for all of them.

Recommendation 2: the past time limit to asses population, area of distribution and habitat quality decline should be decided with respect to the available information.

iii) <u>the clarification regarding the inclusion of "population, area of distribution and habitat quality declines" due to natural phenomena.</u>

This sub-criterion should be applied for assessing populations, area of distribution and habitat quality declines due to external or unnatural factors. Consequently, any information concerning a population decline caused by natural phenomena (hurricanes, natural fire, etc.) should not be included.

Recommendation 3: Any decline in species population, area of distribution and habitat quality due to natural phenomena should not be included for applying this sub-criterion.

iv) <u>the risk to use numerical data for assessing this sub-criterion, taking into consideration that it might be species-dependent and do not express any information related to area of distribution and quality of habitat</u>

It is possible that numerical data by itself can express a species-dependent situation. However, usually when a numerical population decline is observed or inferred, it might be related to a parallel decline in its area of distribution and/or habitat quality (this is the reason why these three parameters –population decline, area of distribution decline and habitat quality decline- are used in this sub-criterion.

Recommendation 4: the observed or inferred population decline should be used in linkage with the area of distribution and habitat quality decline, in order to avoid, as much as possible, a species-dependant situation.

v) clonal species evaluation

Considering the comments for clonal species, that suggests that for the evaluation of this sub-criterion a type of genetic measure should be used and also that this kind o information might require complex and long term studies to obtain, then the applicability of this sub-criterion must be reconsidered.

Recommendation 5: Do not apply this sub-criterion for clonal species.

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A) (ii) each sub-population being very small

What were/are the estimated sizes of the subpopulation(s)? Please include units of measurement.

Relevant definitions for this sub-criterion

Very small wild sub-population.- For some species where data exist to make an estimate, a figure of less than 500 individuals has been found to be an appropriate guideline (not a threshold) of what constitutes a very small sub-population. However, this figure is presented only as an example, since it is impossible to give numerical values that are applicable to all taxa. There will be many cases where this numerical guideline does not apply.

Review summary

Based on the findings for the 20 selected plant species, the following remarks can be made:

- In relation to the applicability of the criterion, 10 reviews consider that the criterion does apply for the species, 2 that it does not apply, and other 8 did not specify.

- Among the remarks made by the reviewers, the following issues arose: 1) the definition of "very small wild sub-population" does not apply to most plants: 2) absolute numbers should not be used in any definition because they can be misleading; 3) the word "very" should be avoided; 4) the definition of very small wide sub-population should be somehow linked with the amount of harvest that the plant could face; 5) the definition should make reference to, and distinguish between, different taxa; 6) there is not enough information of most plants in order to answer this sub-criterion; 7) when responding to this sub-criterion, enough information to substantiate the answer should be provided.

Review recommendations:

The main aspects highlighted by the reviewers are:

i) The need to modify the definition of "very small wild sub-population" to make it clearer and easier to apply.

ii) The need to modify the sub-criterion to avoid having to use the definition of "very small wild sub-population" and to make it less subjective and more useful to evaluate the species status.

Recommendation:

The best option could be to modify the sub-criterion in order to avoid having to define "very small …". The proposed modification goes like this:

"the size of each subpopulation is such that it can be considered to be unviable in the future (justify)".

* *

A) (iii) a majority of individuals, during one or more life-history phases, being concentrated in one sub population

Review summary

Based on the findings for the 20 selected plant species, the following remarks can be made:

- In relation to the applicability of the criterion, only two (2) reviews consider that the criterion does apply for the species, nevertheless they don't give examples of how it applies. Nine (9) indicated the criterion does not apply, and six of these says further that in general the criterion doesn't apply to plant species. Two (2) indicates that the criterion applies (partially), but it can be due to a confusion, because the explanation given considers its applicability to mature individuals or to certain distribution areas of the species, which is not directly related to the applicability of the criterion. Seven (7) did not answer at all.

- Three of the reviews highlighted that even though the criterion doesn't apply to the species there are some examples when some life-history phases might be vulnerable to human factors.

Review recommendations:

There are 3 aspects highlighted by reviewers that need analysis:

i) Applicability of the criterion to plant species in general.

ii) Misinterpretation of the criterion.

iii) An amplified version of the criterion.

Recommendations:

i) The criterion apparently doesn't apply to the reviewed species and to plant species in general.

ii) Apparently the criterion can be subject to misinterpretation, so it might consider avoiding the use for plants or improve the wording.

iii) The possibility to modify this criterion should be considered (analysed) in order to reflect the idea that although the situation presented in the criterion doesn't apply to plant species in general, another risk factor affecting plant species can be the vulnerability of certain life stages to extrinsic (human) factors, such as exploitation or contamination.

* *

A) (iv) large short-term fluctuations in the number of individuals appropriate to measuring population size for the species concerned

If the population was/is characterized by large short-term fluctuations in the numbers of individuals, what was/is the average magnitude in orders of magnitude? What was/is the average period of fluctuation in years?

Relevant definitions for this sub-criterion

Fluctuations.- Fluctuations in population size or area of distribution are considered large when the population size or area in question varies widely, rapidly or frequently. Where data exist to make an estimate, one order of magnitude has been found to be an appropriate guideline (not a threshold) for population size. Similarly, fluctuations can be considered 'short term' if the period of fluctuation is about two years. However, this figure is presented only as an example, since it is impossible to give numerical

values that are applicable to all taxa. There will be many cases where this numerical guideline does not apply.

Review summary

Based on the findings for the 20 selected plant species, the following remarks can be made:

- In relation to the applicability of the criterion, only 1 review considers that the criterion does apply for the species and 10 say it does not apply. 9 other did not specify.

- Among the remarks made by the reviewers, the following matters arose: 1) fluctuations cannot be measured in plants with a long life-cycle or in annual plants; 2) there are usually not enough data from the past to determine if there are fluctuations or not in a population; 3) the definition of "fluctuations" should not include absolute numbers such as: "if the period of fluctuation is about two years"; it would be better to refer to generational time; 4) when responding to this sub-criterion, enough information and data to substantiate the answer should be provided.

Review recommendations:

There are 3 aspects highlighted by reviewers that need analysis:

i) The inapplicability of this sub-criterion to most plants.

ii) The need to modify the definition of "fluctuations" so it does not include absolute numbers, as "two years…"

iii) The need to make the sub-criterion clearer.

Recommendations:

i) Regarding the reviewers, this sub-criterion does not apply to most plant species. However, it does apply to many animals, and for criterion A to be met, only one of its sub-criteria needs to be met. It says: **"A: The wild population is small, and is characterized by at least *one* of the following"**. Hence, we think it is OK to leave it as it is so it can be used in case the species being evaluated applies and there is enough information available.

ii) For the definition of "fluctuations" not to include absolute numbers and therefore be applicable only to some species, we propose that it be related to the generational time of the species being evaluated.

iii) There is a proposal to modify the wording of the sub-criterion for it to be simpler and clearer, and we agree with this modification: **"**large short-term fluctuations outside the normal population cycles of the species concerned**"**.

* *

A) (v) a high vulnerability due to the species´ biology or behaviour (including migration)

Relevant definitions for this sub-criterion

Vulnerability.- Vulnerability can be defined as the susceptibility factors which increase the risk of extinction. There are a number of taxon- or case-specific biological and other factors that may affect the extinction risk associated with a given percentage decline, small population size or restricted area of distribution. These can be, but are not limited to, aspects of any of the following:

- Life history (e.g., low fecundity, slow growth rate, high age at first maturity, long generation time)
- Low absolute numbers or biomass or restricted area of distribution
- Population structure (age/size structure, sex ratio)
- Behavioural factors (e.g., social structure, migration, aggregating behaviour)
- Density (for sessile or semi-sessile species)

- Specialized niche requirements (e.g., diet, habitat)
- Species associations such as symbiosis and other forms of co-dependency
- Fragmentation and habitat loss
- Reduced genetic diversity
- Depensation (prone to continuing decline even in the absence of exploitation)
- Endemism
- Threats from disease or invasive species
- Rapid environmental change (e.g., climate regime shifts)
- *Selectivity of removals (that may compromise recruitment)*

Review Summary

Based on the findings for the 20 selected plant species, the following remarks can be made:

- Ten reviewers claimed that the sub-criterion can be applied; six said it did not apply or was irrelevant. In addition, three reviewers did not answer and one did not clearly specify whether the sub-criterion applies or not.

- Some problems or concerns were pointed out by some of the reviewers: 1) the application of this sub-criterion is more appropriate for animals than for plants; 2) the fact that a high vulnerability of species is hard to evaluate; 3) for clarification, a proposal for modifying the wording of the sub-criterion and definition is needed; 4) the need to clarify "slow growth rate"; 5) the need to homogenize the definition of vulnerability along all the text (the definition appendix is different from the one used in the table).

Review recommendations:

There are 4 aspects highlighted by reviewers that need analysis:

i) <u>the sub-criterion is more appropriate for animals than for plants</u>

Although some of the factors included in the list are evidently animal-biased (low fecundity, high age at first maturity, age(size structure, sex ratio, social structure, migration, diet, niche requirements and so on), there are many others that are usually used in plants (slow growth rate, biomass, restricted area of distribution, species associations, fragmentation and habitat loss, endemism, and so on).

Recommendation 1: This sub-criterion can applied for animals and plants, although not all the factors can be easily be assessed for both.

ii) <u>high vulnerability of species is hard to evaluate</u>

On the basis of the factors that are listed, the species high vulnerability can be evaluated using many/few of them, although not all.

Recommendation 2: It is possible to evaluate the high vulnerability of the species, using some of the factors included in the list.

iii) <u>the need to modify the vulnerability definition along with a more precise classification of the effects or factors due to the modification of the definition</u>

For clarification a reviewer proposed two things: a) a minor modification to vulnerability definition as follows: Vulnerability can be defined as the susceptibility to intrinsic or external factors which increase the risk of extinction. There are a number of taxon- or case-specific biological and other factors that may affect the extinction risk associated with a given percentage decline, small population size or restricted area of distribution. These can be, but are not limited to, aspects of any of the following:

INTRINSIC FACTORS:

- Life history (e.g., low fecundity, slow growth rate, high age at first maturity, long generation time)
- Low absolute numbers or biomass or restricted area of distribution

- Population structure (age/size structure, sex ratio)
- Behavioural factors (e.g., social structure, migration, aggregating behaviour)
- Density (for sessile or semi-sessile species)
- Specialized niche requirements (e.g., diet, habitat)
- Species associations such as symbiosis and other forms of co-dependency
- Reduced genetic diversity
- Depensation (prone to continuing decline even in the absence of exploitation)
- A relatively high level of endemism
- Rapid environmental change (e.g., climate regime shifts)

EXTRINSIC FACTORS:

- Selectivity of removals (that may compromise recruitment)
- Threats from exotic species (hybridisation, disease transmission, depredation, etc.)
- Habitat degradation (contamination, soil erosion, alteration by invasive species, etc.)
- Habitat loss/destruction
- Habitat fragmentation
- Harsh environmental conditions

b) The inclusion of an additional sub-criterion, in order to differentiate the cases in which the species vulnerability is related to intrinsic factors or extrinsic ones.

Recommendation 3: the minor modification of the vulnerability definition that was proposed helps to its clarification and consequently should be adopted. The inclusion of another criterion might not be necessary if, the wording of the sub-criterion is slightly modified as follows: **a high vulnerability due to the species´ susceptibility to either biotic (intrinsic) or abiotic (extrinsic) factors**

iv) clarify or define "slow growth rate"

Taking into consideration that a "slow growth rate" means different things for the different plant groups, it might be useful to define it in terms of their juvenile and maturity ages.

Recommendation 4: A definition of "slow growth rate" should be elaborated.

SYNTHESIS

Giuseppe Frenguelli

European Representative

Appendix I, Criterion B:

The wild population has a restricted area of distribution and is characterized by at least one of the following (see definitions below):

Criterion

The biological criterion "B" is described in the second RESOLVES of document CoP12 Com I.3 as:

"RESOLVES that, when considering proposals to amend Appendices I and II, the following applies:

a) species that are or may be affected by trade should be included in Appendix I in accordance with Article II, paragraph 1, if they meet at least one of the biological criteria listed in Annex 1;

Biological criteria for Appendix I

A species is considered to be threatened with extinction if it meets, or is likely to meet, at least one of the following criteria.

B. *The wild population has a restricted area of distribution and is characterized by at least one of the following:*

i) fragmentation or occurrence at very few locations; or
ii) large fluctuations in the area of distribution or the number of sub-populations; or
iii) a high vulnerability due to the species' biology or behaviour (including migration); or
iv) an observed, inferred or projected decrease in any one of the following:
– *the area of distribution; or*
– *the area of habitat; or*
– *the number of sub-populations; or*
– *the number of individuals; or*
– *the quality of habitat; or*
– *the recruitment.*

The biological criterion "Area of distribution" is then defined in Annex 5 as follow:

"Area of distribution of a species is defined as the area contained within the shortest continuous imaginary boundary which can be drawn to encompass all the known, inferred or projected sites of occurrence, excluding cases of vagrancy and introductions outside its natural range (though inferring and projecting area of occurrence should be undertaken carefully, and in a precautionary manner). The area within the imaginary boundary should, however, exclude significant areas where the species does not occur, and so in defining an area of distribution, account should be taken of discontinuities or disjunctions in the spatial distribution of species. For migratory species, the area of distribution is the smallest area essential at any stage for the survival of that species (e.g., colonial nesting sites, feeding sites for migratory taxa, etc.). For some species for which data were available to make an estimate, a figure of less than 10,000 km^2 has been found to be an appropriate guideline (not a threshold) of what constitutes a restricted area of distribution. However, this figure is presented only as an example, since it is impossible to give numerical values that are applicable to all taxa. There will be many cases where this numerical guideline does not apply."

Review Summary

In total 20 plant taxa have been examined. For 9 species (*Tillandsia xerographica, Strombocactus disciformis, Turbinocactus pseudomacrochele, Dionea muscipula, Cistanche deserticola, Marojejya darianii, Ravenea louvelii, Satranala decussilvae, Morchella esculenta)* the B criterion in general applies to them and the reviewers reported that it works well or works with additional guidance. For 7 species

(*Galanthus elwesii, Panax quinquefolius, Zamia furfuracea, Pericopsis elata, Aloe ferox, Dendrobium nobile, Pseudophoenix ekmanii*) the criterion is easily interpreted and not applicable because the area of distribution is not restricted or there is limited information, but one or more of the sub-criteria *i, ii, iii, iv,* apply to species or might have been resulted in the threat of the species. For 4 species (*Cibotium barometz, Prunus africana, Populus tremuloides, Taxus brevifolia*) the B criterion in general is not applicable because the wild population does not have a restricted area of distribution.

In 16 species assessments, reviewers suggested that the sub-criterion *ii)* (large fluctuations in the area of distribution or the number of sub-populations) does not work because is much more appropriate for animals and it could be deleted.

Some reviewers suggested to improve some definitions to better understand the applicability of the criteria. For *Morchella esculenta*, or fungi in general, instead of "area of distribution" could be more convenient to mention the habitat/ecosystem to which these populations are associated.

Review Recommendations

There are 3 aspects pointed out by the reviewers that need analysis:

i) Request of definitions
ii) Applying the sub-criteria even if the answer at the general criterion is "No"
iii) Criterion of fluctuation

i) Request of definitions

All the reviewers highlighted the difficulties on applying the criteria using some definition as in Appendix 5 such as: restricted area, inferred and projected, population growth rate, fragmentation, habitat quality, few species locations, vulnerability, and asked to clarify the concepts. In particular, about "restricted area of distribution", as it needs to be applicable for a wide range of taxa, the figure of 10,000 Km^2 does not apply for all the different species and absolute numbers should not be included in any case because they can be misleading. The reviewers should provide numerical, biological or geographical factors that characterize the population's area of distribution for the species. For fungi, the reviewers suggested that the definition of area of distribution could be improved by addition of something like "or the boundaries of the habitat/ecosystem to which the species is associated".

Recommendation 1: Clarification of some concepts and about the area of distribution the definition should not include any unit of measure and the level of restriction could be defined and justified.

ii) Applying the sub-criteria even if the answer at the general criterion is "No"

There is confusion on how apply the criteria. For some reviewers the B criterion is not applicable because the species has not a restricted area of distribution (bigger than 10.000 km^2), i.e. *Prunus africana,* or the area is not known because there is limited information to estimate it. But, at the same time, the reviewers apply one or more of the sub-criteria *i), ii), iii), iv)*, because the species could be endangered even if the area of distribution is not restricted. If the answer to "B" is NO, is it correct to try to apply the sub-criteria? For some reviewers the answer is "yes" because the habitat could be fragmented severely or the quality declined (*Dendrobium nobile*), while for others the answer is "no".

Recommendation 2: Clarification of the biological criterion and its application.

iii) Criterion of fluctuation

In 16 species assessments, reviewers suggested that the sub-criterion *ii)* does not work because is much more appropriate for animals. The concept of fluctuation is not relevant and not applicable to most long-lived plant taxa and may have limited applicability for annual plant species. This criterion is not applicable because variation in the area of distribution is either contracting or expanding, but not fluctuating, so it is not very useful (*Strobocactus disciformis*) or very complicated term to apply in many species.

Annex 5: Fluctuations

Fluctuations in area of distribution is considered large when the area in question varies widely, rapidly or frequently. Where data exist to make an estimate, one order of magnitude has been found to be an appropriate guideline (not a threshold) for population size. Similarly, fluctuations can be considered 'short term' if the period of fluctuation is about two years. However, this figure is presented only as an example, since it is impossible to give numerical values that are applicable to all taxa. There will be many cases where this numerical guideline does not apply.

Recommendation 3: Eliminate the fluctuation criterion from the sub-criteria list for plants.

Other comments

Some reviewers provided additional interesting comments.

The reviewers of *Tillandsia xerographica* made the following comment about the criterion *iii)* (high vulnerability): the high vulnerability due to the species' biology is difficult to be assessed and this criterion does not work for many plant groups. This sub-criterion could be taken into consideration in the other sub-criteria or moved to another criterion.

Again about the *iii)* "vulnerability" sub-criterion: the reviewers of *Pseudophoenix ekmanii* made this comment: "why is the definition for vulnerability different in the appendix than the checklist at the end of this table?"

(Checklist) - For criteria *B)(iii),* please check which if any of the *vulnerability* factors listed below apply: low fecundity, slow growth rate, high age at first maturity, distorted age, size or sex ratio, complex social structure, extensive migratory behaviour, strong aggregating behaviour (e.g., schooling), low population density (for sessile or semi-sessile species), specialized niche requirements (e.g. diet and habitat), species associations such as symbiosis and other forms of co-dependency, fragmentation and habitat loss, reduced genetic diversity, depensation (prone to continuing decline, even in the absence of exploitation), high degree of endemism, threats from disease, threats from invasive species, threats from rapid environmental change (e.g. climate regime shifts), selectivity of removals (that may compromise recruitment), Other (please specify).

(Appendix 5) - Vulnerability can be defined as the susceptibility to intrinsic or external effects which increase the risk of extinction. There are a number of taxon- or case-specific biological and other factors that may affect the extinction risk associated with a given percentage decline, small population size or restricted area of distribution.

These can be, but are not limited to, aspects of any of the following: Life history (e.g., low fecundity, slow growth rate, high age at first maturity, long generation time), Low absolute numbers or biomass or restricted area of distribution, Population structure (age/size structure, sex ratio), Behavioural factors (e.g., social structure, migration, aggregating behaviour), Density (for sessile or semi-sessile species), Specialized niche requirements (e.g., diet, habitat), Species associations such as symbiosis and other forms of co-dependency, Fragmentation and habitat loss, Reduced genetic diversity, Depensation (prone to continuing decline even in the absence of exploitation), Endemism, Threats from disease or invasive species, Rapid environmental change (e.g., climate regime shifts), Selectivity of removals (that may compromise recruitment)

The reviewers of *Dionea muscipula* suggested the following definition about "isolated sub-populations": "*isolated sub-population that prevent or limit the transfer of genetic material between individuals*" and suggested to move some of sub-criterion *iv)* to category "A" (number of sub-populations, number of individuals, recruitment).

In relation to the sub-criterion *iv)*, the reviewers of *Populus tremuloides* suggested that, in general, this criterion do not employ effective silvicultural and biological proxies for determination of threat of extinction of temperate and boreal forest tree species.

Finally, in some assessments the reviewers did not have enough information available to determine the applicability of one or more sub-criteria.

In general, the biological criterion B for Appendix I works well and can be applied to most plants species, moreover it needs clarifications because in some definitions there are elements that are difficult to apply and, sometimes, a degree of flexibility in the options is necessary.

SYNTHESIS

Margarita Clemente Muñoz

European Representative

Appendix I, Criterion C: A marked decline in the population size number of individuals in the wild, which has been either (see definitions below):

Criterion

The biological criterion "C" is described in the second RESOLVES of document CoP12 Com I.3 as:

"RESOLVES that, when considering proposals to amend Appendices I and II, the following applies:

a) species that are or may be affected by trade should be included in Appendix I in accordance with Article II, paragraph 1, if they meet at least one of the biological criteria listed in Annex 1;

Biological criteria for Appendix I

A species is considered to be threatened with extinction if it meets, or is likely to meet, at least one of the following criteria.

C. A marked decline in the population size in the wild, which has been either:

i) observed as ongoing or as having occurred in the past (but with a potential to resume); or
ii) inferred or projected on the basis of any one of the following:
   – a decrease in area of habitat; or
   – a decrease in quality of habitat; or
   – levels or patterns of exploitation; or
   – threats from extrinsic human-induced factors such as competition/predation by introduced species or the effects of hybridization, toxins and pollutants; or
   – a decreasing recruitment.

Review Summary

In total 20 plant taxa have been examined. The criterion works well to *Galanthus elwessi*; *Panax quinquefolius*; *Tillandsia xerographica*, *Strombocactus disciformis*; *Turbinicarpus pseudomacrochele*, *Dendrobium nobile*; *Marojejya darianii* and *Morchella esculenta*. For the rest of the taxa it would be necessary some additional guidance or amendments.

It is unclear whether this criterion strictly refers to population size or area of distribution or both due to the definition of decline which covers both (*Pericopsis*). Also it was pointed out that the application of this criterion is some difficult due to the lack of hard data (*Cibotium*, *Cistanche, Ravenea, Satranala*) or the quality of the information.

Some reviewers pointed out that Ci) seemed a good criterion but for plants this was difficult to assess. (*Galanthus*)

Regarding to Cii) threats from extrinsic human-induced factors such as competition/predation by introduced species or the effects of hybridization, toxins and pollutants; or, some reviewer stated that was unknown or not applicable to most plant species. Other reviewer suggested to change: drop "human-induced" from the text (*Dioaneae*)

Review Recommendations

There are several aspects pointed out by the reviewers that need analysis:

C) A marked decline in population size in the wild, which has been either (see definitions below):

- to clarify if the criterion strictly refers to population size or area of distribution or both (*Pericopsis*)

- the extent of decline needs to be specified relative to overall population size (*Aloe*).
- difficult application due to the lack of hard data. The views of national and international experts with field knowledge of the taxa are therefore critical to the assessment. It is therefore vital that such opinion should carry similar weight to published information available for the better known groups. If this is the case then this criterion can be applied to plants (*Cistanche*).
- how to make an exact estimate of the long-term extent of decline and the recent rate of decline for such a wide distributed species without hard data (*Dendrobium*).
- the definition of "effective population size" (i.e., individuals capable of reproduction) is ambiguous in the context of clonally reproducing species (*Populus*).
- the criteria for all subsections of (C) do not closely address the successional nature of species distribution in temperate and boreal forests. As habitat area and quality are normally expected to naturally cycle over time, interpretation of the criteria must be carried out at a very broad landscape scale, and over extended time periods (*Populus*).
- to define "wild"? (*Pseudophoenix*)

C ii) inferred or projected on the basis of any one of the following:

- to apply "vulnerability"and the following editorial changes are proposed:
  "Using the checklist provided at the end of this table (and accompanying definitions in the glossary) as a guide, please explain which vulnerability factors affect this species/population/sub-population and why". (*Pseudophoenix*).
- inference or projection on the basis of habitat quality requires assessment of the ecological amplitude of each species in question (*Taxus*).

• a decrease in area of habitat; or

- to accept an experts best guess (*Cistanche*).

• a decrease in quality of habitat; or

- quality of habitat is difficult to measure (*Aloe*) and needs to be defined (*Dionaea*).
- a decrease in quality of habitat: interpretation unclear for early-succession species: to change to "Decrease in appropriate habitat across an identifiable geographic zone" (*Populus*).
- difficulties in interpretation. Inference or projection on the basis of habitat quality requires assessment of the ecological amplitude of each species in question (*Taxus*).

• levels or pattern of exploitation; or

- to accept an experts best guess (*Cistanche*).

• threats from extrinsic human-induced factors such as competition / predation by introduced species or the effects of hybridization, toxins and pollutants; or

- to drop "human-induced" from the text (*Panax*) and to include stochastic events in this question (*Pseudophoenix*).

• a decreasing recruitment

- very difficult to measure almost impossible (*Morchella*)
- interpretation of 'effective population size' (i.e., individuals capable of reproduction) and "decreasing recruitment" is critical and, for certain tree species, would require careful inventory and appropriate interpretation of ongoing ecological processes. Suggest explicit reference to vegetative reproduction be included under definition "Population Issues, Population Size", similar to the reference under definition of "recruitment" (*Taxus*).

Other comments:

- demographic viability of population needs assessment and in glossary it should be underlined.

SYNTHESIS

Margarita Clemente Muñoz

European Representative

Appendix I, Criterion D: If not included in Appendix I, is likely to satisfy one or more of criteria A-C within 5 years?

Criterion

The biological criterion "D" is described in the second RESOLVES of document CoP12 Com I.3 as:

"RESOLVES that, when considering proposals to amend Appendices I and II, the following applies:

a) species that are or may be affected by trade should be included in Appendix I in accordance with Article II, paragraph 1, if they meet at least one of the biological criteria listed in Annex 1;

Biological criteria for Appendix I

A species is considered to be threatened with extinction if it meets, or is likely to meet, at least one of the following criteria.

D. The status of the species is such that if the species is not included in Appendix I, it is likely to satisfy one or more of the above criteria within a period of five years.

Review Summary

In total 20 plant taxa have been examined. The criterion works well to *Tillandsia xerographica, Strombocactus disciformis, Turbinocactus pseudomacrochele*; *Dionea muscipula*; *Marojejya darianii, Ravenea louvelii, Satranala decussilvae* and *Morchella esculenta*. It would works with amendments to *Galanthus elwesii, Pericopsis elata*, *Dendrobium nobile, Populus tremuloides* and *Taxus brevifolia.*

Some coment pointed out that it is a good and applicable criterion. When it is applied the outcome is a clear "No." However there does seem to be an inconsistency with regard to the time frame when you compare with Criterion A of Appendix II. (*Galanthus*). Also it was pointed out some conflict with timescale in Appendix II A criterion (*Pericopsis*).

On the other hand several coments highlight that the criterion can be interpreted but is speculative (*Populus, Taxus*), also it was pointed out that the characterization of "near future" as 5 years is spurious in relevance to a preponderance of species. Aside from the "5-year" characterization, what is the difference between this Category, versus Appendix-II, Category A. (*Pseudophoenix*)

Review Recommendations

There are several aspects pointed out by the reviewers that need analysis:

- to eliminate because the criterion is speculative.
- to clarify the difference between this Category, versus Appendix-II, Category A.

SYNTHESIS

Margarita Clemente Muñoz

European Representative

Appendix II, 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; or

Criterion

The criterion "A" is described in the second RESOLVES of document CoP12 Com I.3 as:

RESOLVES that, when considering proposals to amend Appendices I and II, the following applies:

b) species should be included in Appendix II under the provisions of Article II, paragraph 2 (a), if they satisfy the criteria listed in Annex 2a;

Annex 2 a:

The following criteria must be read in conjunction with the definitions, explanations and guidelines listed in Annex 5, including the footnote with respect to application of the definition of "decline" for commercially exploited aquatic species.

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 is met:

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; or

Review Summary

In total 20 plant taxa have been examined. The criterion works well to *Panax quinquefolius, Cibotium barometz, Dionaea muscipula, Tillandsia xerographica, Strombocactus disciformis,* and *Turbinicarpus pseudomacrochele*,

The reviewers pointed out the following:

The range of possibilities allowed by this criterion is large (*Aloe*) given that the trade appears to have an impact, but only in limited areas of its distribution.

When there are few special studies about the species, the period of the near future, which is 5-10 year in guideline, is difficult to ascertain (*Cistanche, Dendrobium*).

This criterion implies a taxon can qualify for Appendix II to regulate trade to ensure that it does not become eligible for Appendix I in the near future. In that case near future is suggested to be 5-10 years. However, Appendix I criterion D advocates listing in Appendix I if it is likely to meet the criteria within 5 years. Confusing. Some guidance is required. (*Galanthus*).

Regulation of trade in some species may have little if any effect on avoiding eligibility for inclusion in

Appendix I (*Marojejya, Raveneai, Satranala*)

Review Recommendations

There are several aspects pointed out by the reviewers that need analysis:

- to clarify the meaning of this criterion regarding the meaning of Appendix I criterion D
- to clarify the definition of "near future"
- if "near future" remains, it should be underlined as it is in the glossary.

- The following editorial changes are suggested: Add the phrase: *Using the checklist provided at the end of this table (and accompanying definitions in the glossary), please explain which vulnerability factors affect this species/population/sub-population and why*.
- To add to criterion: *If the answer is "yes" explain.*

Other comments

Just a few range states have some kind of "general regulations" for mushroom harvesting, less than five regulate with some kind of specific legislation for the genus *Morchella* and none has a specific regulation for the species *Morchella esculenta*. In those countries were some legislation does exist, control mechanisms are generally inadequate

There may be a problem with numbers required to define 'small population'. Many cycads have relatively small populations of < 10 000 plants (*Zamia furfuracea*).

SYNTHESIS

Margarita Clemente Muñoz

European Representative

Appendix II, Criterion B: It is known, or can be inferred or projected, that harvesting of specimens from the wild for international trade has, or may have, a detrimental impact on the species by either…..

Criterion

The criterion "B" is described in the second RESOLVES of document CoP12 Com I.3 as:

RESOLVES that, when considering proposals to amend Appendices I and II, the following applies:

b) species should be included in Appendix II under the provisions of Article II, paragraph 2 (a), if they satisfy the criteria listed in Annex 2a;

Annex 2 a:

The following criteria must be read in conjunction with the definitions, explanations and guidelines listed in Annex 5, including the footnote with respect to application of the definition of "decline" for commercially exploited aquatic species.

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 is met:

B. It is known, or can be inferred or projected, that 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.

Review Summary

In total 20 plant taxa have been examined. The criterion works well to *Dendrobium nobile*, *Dionaea muscipula, Galanthus elwesii, Cibotium barometz, Morchella esculenta, Panax quinquefolius, Pericopsis elata, Turbinicarpus pseudomacrochele, Ravenea louvelii and Prunus africana.*

The reviewers pointed out the following to the criterion B:

Detrimental impact needs to be defined (*Aloe*).

Hard data are still difficult to get to application of the criterion (*Cibotium*).

Insufficient information to give a firm answer here but presumably can apply the precautionary principle given he size of the populations and the trade interest. (*Marojejya, Satranala*).

The notion of how close and how quickly a population is declining towards the minimum viable population size (MVP) is central to a number of definitions, including population size, fluctuation and marked decline. Explicit reference to a specific rate-based measure is required to interpret these criteria. (*Populus*).

Is use of the term "sustainability" purposely avoided here? (*Pseudophoenix*)

Providing a measure of how close and how quickly a population is declining towards minimum viable population size (MVP) is basic to Criteria B (i) and (ii). Problems with interpretation of term "Marked decline". Explicit reference to a specific rate-based approach to MVP is required to interpret these criteria (*Taxus*).

The reviewers pointed out the following to the criterion Bi):

The definition need more clarity (*Aloe*)

Can apply this criteria if expert opinion is acceptable (*Cistanche*).

'*Extend period*' for this species is unclear due to the lack of biological study for this species (Dendrobium).

This is very difficult if not impossible to determine for most plant taxa (*Dionaea, Panax*).

It should be noted that one biological trait could work in the reverse. Increased harvesting could provided the high light requirements for increased recruitment (*Pericopsis*).

Explicit reference to a specific rate-based approach to MVP is required to interpret these sub-criterion (*Taxus*).

This is difficult to measure for cycads. They are long lived and slow to recruit. Recruitment also seems to take place in distinct events which have not been well documented (*Zamia*).

The reviewers pointed out the following to the criterion Bii):

This is very difficult if not impossible to determine for most plant taxa (*Dionaea, Panax*).

Review Recommendations

There are several aspects pointed out by the reviewers that need analysis:

- to define "detrimental impact"

- phrase "by either" should be deleted because sub-criterion B(i) and B(ii) should be removed.

  The vulnerability factors listed below are not complete enough to assist in the evaluation of this criterion. It is suggested that additional factors from the IUCN checklist for making non-detriment findings also be included. These are:
  - *low regeneration potential*
  - *limited pollination (not in the NDF checklist but should be)*
  - *poor dispersal efficiency*
  - *restricted distribution*
  - *low abundance*
  - *decreasing population trend*
  - *little or no management of harvest*
  - *minimum control of harvest*
  - *limited or no harvest monitoring program*
  - *little or no incentives/benefits from harvest*

  In addition:
  - *harvest removal of individuals (whole specimen)*
  - *difficult to artificially propagate taxon*
  - *introduce non-native invasive species.*

- to add to criterion and sub-criteria: *If the answer is "yes" explain*

- to Bi) the following editorial changes are proposed:
  Exceeding, over an *extended period*, the level that can be ~~continued to perpetuity~~ *sustained indefinitely at current levels. Provide numerical, biological or geographic information that characterizes the fluctuation and to substantiate its importance to the survival of the species in the wild.*

- to provide a measure of how close and how quickly a population is declining towards minimum viable population size (MVP) is basic to Criteria B (i) and (ii). Problems with interpretation of term "Marked decline". Explicit reference to a specific rate-based approach to MVP is required to interpret these sub-criteria.

- to Bii) the following editorial changes are proposed: *Using the checklist provided at the end of this table (and accompanying definitions in the glossary), please explain which vulnerability factors affect this species/population/subpopulation and why.*

SYNTHESIS

John Donaldson

Representative of Africa

Appendix II, Criterion C: The specimen of the species in the form in which it is traded resembles specimens of a species included in Appendix II under the provisions of Article II, paragraph 2(a), or in Appendix I, such that a non-expert with reasonable effort, is unlikely to be able to distinguish between them

Criterion

The trade criterion is described in Annex 2b of document CoP12 Com 1.3 under the heading 'Criteria for the inclusion of species in Appendix II in accordance with Article II, paragraph 2(b) of the Convention" as:

A. *The specimen of the species in the form in which it is traded resembles specimens of a species included in Appendix II under the provisions of Article II, paragraph 2(a), or in Appendix I, such that a non-expert with reasonable effort, is unlikely to be able to distinguish between them*

Review Summary

The Criterion was regarded as applicable for 14 of the 20 species that were included in the review process, not applicable for five species, and there was no comment (in the English version) for *Prunus africana.* Three of the five species for which the criterion was regarded as 'not applicable'were palm species. The other two were American ginseng (*Panax quinquefolius*) and *Taxus brevifolius.* The reviewers did not always comment on why the criterion was not applicable, but the implication is that these taxa can be relatively easily identified by non-experts. In the case of palms, *Pseudophonenix ekmanii* was the only species under review for which the criterion was considered to apply because seedlings could be confused with other palm species. The remaining species for which the criterion was regarded as applicable included plants that may be traded as whole plants (e.g. cacti and cycads), parts of plants (e.g. bulbs, pseudobulbs, stems, bark), or processed material (e.g. timber, extracts), with varying levels of difficulty in terms of identification by non-experts.

The reviewers highlighted two possible problems with the application of this criterion, related to what a 'non-expert with reasonable effort' will be able to identify. The first problem is the definition of 'non-expert'. The reviewers of *Cibotium* and *Cystanche* noted that many plant species are difficult for non-experts to identify and the criterion can only be applied if it is assumed that there is some basic level of expertise. They concluded that the definition needed to be tightened up. The problem of defining the level of expertise was also evident in the review of *Dionaea* where it was noted that the pseudobulb could be confused with other bulbs unless the non-expert knows that they need to look for the presence of scales on the pseudobulb. In other words, the non-expert requires some form of training.

The second issue concerns possible confusion regarding the interpretation of 'reasonable effort'. In the case of *Strombocactus,* one reviewer regarded the look alike criterion as important because species may be confused by non-experts whereas the second reviewer felt that there were sufficient guides to enable non-experts to identify the species that are threatened by trade. This implies that 'reasonable effort' should include the use of available identification tools. However, the reviewers of *Populus* reported that identification may require specific tools such as electrophoresis to detect genetic markers. The application of this criterion therefore requires some agreement on what constitutes reasonable effort.

Review Recommendations

The problems highlighted by reviewers are all related to the interpretation of what a 'non-expert with reasonable effort' will be able to identify.

It is implicit in the text that 'non-expert' means someone with no specialist knowledge of the taxonomy of the group that is listed in the appendices. However, as several reviewers have noted, this does not necessarily mean someone with no ability to identify the species in trade, otherwise a large number of species will qualify for listing. It seems that a workable interpretation needs to fall between these extremes, such as someone with a basic training in the identification of CITES listed species.

Similarly, it is implicit that ‘reasonable effort’ means that the person doing the identification will be able to use readily available tools for identification. It is probably unreasonable to expect this to include special tools such as electrophoresis.

A possible solution to the problem of defining 'non- expert' and 'reasonable effort' is to make these terms more explicit in the text. The text could then read:

The specimen of the species in the form in which it is traded resembles specimens of a species included in Appendix II under the provisions of Article II, paragraph 2(a), or in Appendix I, such that a person with a basic training in identifying CITES listed species, and using readily available identification tools, is unlikely to be able to distinguish between them

SYNTHESIS

Margarita Clemente Muñoz

European Representative

Appendix II, Criterion D: There are compelling reasons other than those given in criterion C above to ensure that effective control of trade in currently listed species is achieved.

Criterion

The criterion is described in the second RESOLVES of document CoP12 Com I.3 as:

RESOLVES that, when considering proposals to amend Appendices I and II, the following applies:

c) species should be included in Appendix II under the provisions of Article II, paragraph 2 (b), if they satisfy the criteria listed in Annex 2b;

Annex 2 b:

Species may be included in Appendix II in accordance with Article II, paragraph 2(b), if **either one** of the following criteria is met:

B. There are compelling reasons other than those given in criterion A above to ensure that effective control of trade in currently listed species is achieved.

Review Summary

In total 20 plant taxa have been examined. This criterion works well to *Dionaea muscipula*, *Pericopsis elata, Strombocactus disciformis, Taxus brevifolia* and *Turbinicarpus pseudomacrochele.*

The reviewers pointed out that the interpretation of the meaning and rationale of the criterion was clear in spite of it was not applicable to some of the taxa.

The precautionary principle. For taxa for which area of distribution is also important, perhaps it would be possible to analyse the criteria not only with respect to the entire population but at the same time with respect to subpopulations with separate listing in the appendices to take account of "pressions relatives" exercised in each biogeographic region and genetic differences of the subpopulations (*Prunus*).

Why does this refer to Category C, but not to Categories A and B ?(*Pseudophoenix*)

Review Recommendations

No recommendations.