

Agenda item 8.9

Revised Strategic Framework and guidelines for the future development of the List of Wetlands of International Importance

Action requested: The Standing Committee is invited to approve the proposed revisions to the “*Strategic Framework and guidelines for the future development of the List of Wetlands of International Importance*” for consideration by COP9 as an Annex to COP9 DR1 (Additional scientific and technical guidance for implementing the Ramsar wise use concept).

Note by the Ramsar Secretariat

1. In response to Action 17.1.5 of the Ramsar Strategic Plan 2003-2008, actions for the Scientific and Technical Review Panel (STRP) in COP8 Resolution VIII.10, and requests from the 6th meeting of the Conference of the Parties to the Convention on Biological Diversity (CBD) in relation to Ramsar/CBD joint work on inland waters (Decision VI/4) and coastal and marine ecosystems, the STRP had a number of related tasks identified as priorities for its 2003-2005 Work Plan concerning further development of the Criteria and guidelines for Ramsar site designation.
2. To undertake work on these and related issues the Panel established a Working Group (WG3), co-led by David Stroud (UK) and Dick Ho (Malaysia).
3. The STRP’s Working Group for this triennium has focused on the required rolling review of the Ramsar Criteria for identifying Wetlands of International Importance to ensure that these reflect global wetland conservation and wise use priorities and, within this, in particular on:
 - i. Additional guidance for the application of aspects of Criteria 5 and 6 for waterbirds;
 - ii. Developing a quantitative Criterion (Criterion 9) for non-avian wetland-dependent faunal species;
 - iii. Incorporation of recognition of cultural and socio-economic importance of wetlands into the Criteria; and
 - iv. Expansion of the suite of Ramsar Criteria to achieve consistency with the CBD’s Annex I of aspects of biological diversity (a task which has been met through the work on aspects i. to iii. above).
4. To address these, the STRP and its Working Group 3 have prepared proposals for amendments to the *Strategic Framework and guidelines for the future development of the List of Wetlands of International Importance* adopted by Resolution VII.11 and amended by Resolutions VII.13, VIII.11 and VIII.33 and their annexes.
5. These proposed amendments are attached, to be presented to COP9 as COP9 DR1 – Annex D. Since the proposed amendments concern only some sections of the current

Strategic Framework, the Panel decided that only the proposed changes should be communicated to the COP, and the COP should be asked to instruct the Secretariat to perform the editorial tasks of incorporating the changes it adopts into an updated edition of the *Strategic Framework* after the COP (Decision STRP12-20).

6. At COP8 the Ramsar Secretariat was instructed to consolidate the additional COP8 guidance into the original *Strategic Framework* adopted by COP7, and this was done as Ramsar Wise Use Handbook 7 (2nd edition), “Designating Ramsar sites”. The numbering of sections and paragraphs in the attached COP9 DR1 – Annex D refers to those in Handbook 7, 2nd edition.
7. The STRP has also recognized that a number of other parts of the current *Strategic Framework* text will need updating to reflect changes in terminologies and cross-references to other Convention materials, including a number of those which will be considered by COP9 for adoption. The Panel has recommended that COP9 instruct the Secretariat to undertake all such updating necessary, as part of its preparation of a 3rd edition of Ramsar Wise Use Handbook 7.
8. Likewise, the proposed adoption of the additional Criterion 9 will require some modifications to the format of the current version of the Information Sheet on Ramsar Wetlands (RIS). It would also be appropriate to amend the Explanatory Note and Guidelines for filling in the RIS to cover Criterion 9, as well as, for Criterion 1, to explain justifying the application of this Criterion for the different types of wetlands services for which the site is being designated. COP9 will be asked to instruct the Secretariat also to make these modifications and issue a revised RIS and accompanying Explanatory Note. These mandates are being incorporated into the Annex to COP9 DR2 (Future scientific and technical implementation of the Convention).
9. In order to assist the Standing Committee and Parties at COP9, the STRP has also prepared a COP9 Information Paper which sets out the rationale and thinking behind each of Working Group 3’s main proposals for amendments to the *Strategic Framework*. This is provided as Annex 1 to this document. The Standing Committee may wish to note that in preparing its proposed amendments to the *Strategic Framework*, the STRP has found that the Millennium Ecosystem Assessment’s (MA) Conceptual Framework, its description of ecosystem services, and its use as a basis for developing updated definitions of “wise use” and “ecological character” (see DOC. SC31-7) have proved of considerable assistance.
10. In relation to Criterion 1, the STRP was asked, through Resolution VIII.10 and CBD Decision VI/4, to establish ways and means of reflecting, *inter alia*, the cultural and socio-economic importance of wetlands in the suite of Ramsar Criteria. In reviewing this issue, the Panel recognized that the current guidelines for the application of Criterion 1 cover some (hydrological), but not all, types of ecosystem services recognized in the MA’s Conceptual Framework. In the light of this, the Panel has concluded that it is most logical and appropriate to expand the Criterion 1 guidelines in order to cover all types of ecosystem service (*sensu* MA), including cultural and socio-economic services, rather than seeking to establishing separate additional Criteria.
11. Concerning the proposed new Criterion 9, the STRP has agreed a procedure for establishing a list of population estimates of non-avian wetland-dependent fauna and mega-fauna and updating it in future via the IUCN’s Web-based Species Information

Service (SIS) (Decision STRP12-25). The Panel has recommended that a first list should be published as a *Ramsar Technical Report*. For information, an initial draft of this *Technical Report* is provided in Annex 2 to this document. It is anticipated that further expansion of the range of species covered may be possible for the first published version of this *Technical Report*. The Standing Committee may wish to note that this procedure is analogous with that undertaken by Wetlands International for waterbird populations and 1% thresholds for the application of Criterion 6, through the publication of the regularly-updated *Waterbird Population Estimates*, a 4th edition of which is expected to be available by the time of COP9.

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COP9 DR1 – Annex D:

Revised Strategic Framework and guidelines for the future development of the List of Wetlands of International Importance

Explanatory notes by the Ramsar Secretariat:

1. The text below contains only those sections or paragraphs for which significant amendments or additions are proposed. Where a text amendment is proposed, the original text is shown with strikethrough, thus: ~~example text for deletion~~; and proposed replacement text is shown in square brackets, thus:[example text for insertion].
2. Explanatory text indicating the type of change proposed is indicated in the text below in grey-tinted text. These explanatory texts are not being proposed for adoption by Parties at COP9.
3. Where the insertion of additional paragraphs of text is proposed, these are numbered A1; A2, A3 ... etc. for ease of reference.
4. Section and paragraph numbering is that of the Ramsar Wise Use Handbook 7 (2nd Edition), which provides the consolidated version of the *Strategic Framework* as amended by COP8 Resolutions. This is available at http://ramsar.org/lib_handbooks_e07pre.doc.
5. The Scientific and Technical Review Panel (STRP) has identified a number of other parts of the text of the current *Strategic Framework* which will need to be factually amended or updated a) consequent on the adoption of other COP9 Draft Resolutions (notably COP9 DR1 – Annex A, and b) where there are time-limited references and contexts which have been superseded (e.g., reference to IUCN Red List assessments).
6. The proposed adoption of new Criterion 9 will mean that a subsequent amendment to the current Information Sheet on Ramsar Wetlands (RIS) will be needed to incorporate this.
7. Actions instructing the Ramsar Secretariat to make the further changes to the *Strategic Framework* necessary following the adoption of this and other COP9 Resolutions, including sequential renumbering of paragraphs, are included in the Annex to COP9 DR2 (Future scientific and technical implementation of the Convention).
8. A COP9 Information Paper (COP9 DOC. ~~Xxx~~) provides the background and rationale to the proposed changes to the *Strategic Framework* as set out below.

II. The vision, objectives and short-term target for the List of Wetlands of International Importance (the Ramsar List)

Modify, as follows, the Vision for the List in the light of proposed changes to the definition of “ecological character” [COP9 DR1 – Annex A]

The vision

To develop and maintain an international network of wetlands which are important for the conservation of global biological diversity and for sustaining human life through the ~~ecological and hydrological functions~~ [ecosystem services] they ~~perform~~ [deliver].

IV. Guidelines for adopting a systematic approach to identifying priority wetlands for designation under the Ramsar Convention

Add additional guidance after current paragraph 45:

- [A1. **Ensure that out of sight is not out of mind.** Fish are not only an integral part of aquatic ecosystems, but are a vital source of food and income for people throughout the world. However, the production of fisheries in many parts of the world is declining as a consequence of unsustainable harvest regimes and the loss and degradation of spawning areas. Underwater species such as fish and other aquatic fauna and flora can often be overlooked in the development of cases for Ramsar site designation, unlike more visible animals and plants. Such aquatic interests should be carefully and systematically reviewed.]

Add additional guidance after current paragraph 51:

- [A2. **Sites of cultural and/or socio-economic importance.** Wetlands exist within landscapes in which people and these ecosystems interact at varying temporal and spatial scales such that not only are cultural values and socio-economic activities influenced by wetland ecosystems, but the wetlands themselves are influenced by the cultural values and socio-economic activities of dependent local communities (e.g., by forms of traditional management). There are many examples where the maintenance of the ecological character of wetlands depends upon the interaction of human socio-economic and cultural activities on the wetland's biological, chemical, and physical parameters. In such cases, and where there is close dependency between the ecological character of a wetland and its cultural and/or socio-economic importance for human populations, such sites may be considered for selection under Criterion 1 in accordance with the more detailed guidance associated with this Criterion.]

Move section IV.I (Guidelines for identifying and designating specific wetlands types) to follow section V, to improve readability and use of the *Strategic Framework*.

V. Criteria for identifying Wetlands of International Importance, guidelines for their application, and long-term targets

Amend Criterion 1 as follows:

Criterion 1

A wetland should be considered internationally important if it contains a representative, rare, or unique example of a natural or near- ~~near-~~ [most-]natural wetland type found within the appropriate biogeographic region.

Guidance for the application of Criterion 1

Amend current paragraph 168 as follows:

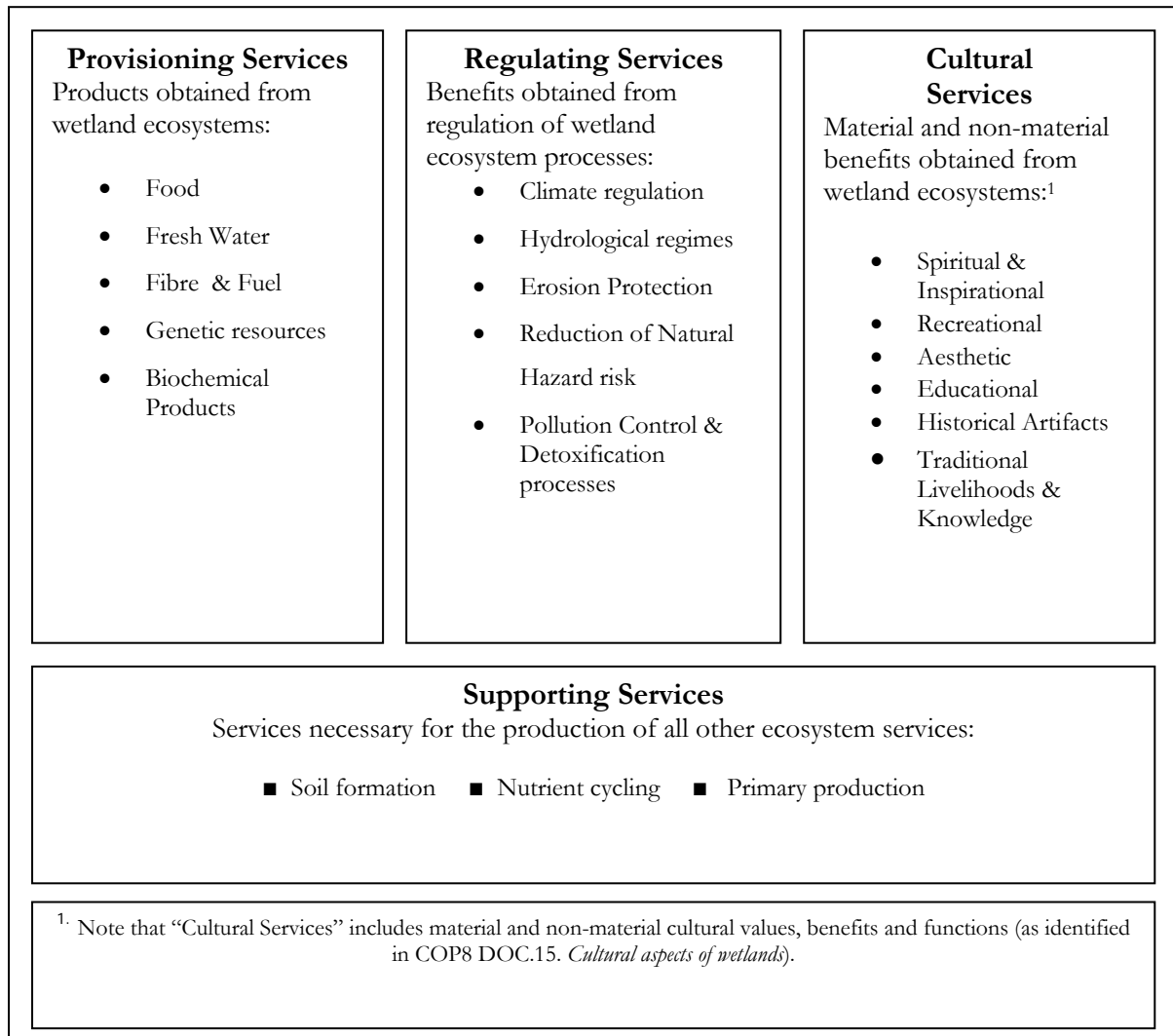
168. Objective 1 and, in particular 1.2 (paragraph 10 above), indicates that another consideration under this Criterion is to give priority to those wetlands ~~which play a substantial hydrological, biological or ecological~~ [whose ecological character plays a substantial] role in the natural functioning of a major river basin or coastal system.”

Add additional guidance after current paragraph 168:

- [A3. A “most-natural” wetland should be considered internationally important if the maintenance of the ecological character of the site is dependent upon wise use [COP9 DR1 – Annex A]. The ecological character of such sites is strongly linked to provisioning, regulating, cultural or supporting ecosystem services (Box XX). These wetlands will be sites that have, *inter alia*, one or more of the following general characteristics:
- i. Sites which directly support the sustainable livelihoods of significant numbers of people;
 - ii. Sites where the provision of ecosystem services is of major importance in national contexts;
 - iii. Sites where the importance of ecosystem services provided extends significantly beyond the borders of the site concerned (e.g., in terms of the role of the site within wider catchment or flyway contexts, or the provision of water and food to human populations elsewhere);
 - iv. Sites which have considerable value as national and international models of wetland wise use, demonstrating the application of traditional knowledge and methods of management and use that maintain the ecological character of the wetland;
 - v. Sites that have considerable value as national and international models where the ecological character is dependent upon an outstanding cultural heritage (movable and building heritage) related to wetland management (such as watermills, waterwheels, acequias, fuggaras, traditional irrigation systems, and salt pan infrastructures);
 - vi. Sites which have exceptional cultural traditions or records of former civilizations that have influenced the ecological character of the wetland;
 - vii. Sites with outstanding cultural landscapes as a result of interaction between human communities and ecosystems, and where ecological character of the wetland depends on the maintenance of the features of these landscapes;
 - viii. Sites which have outstanding examples representing major stages of earth’s history, including geological and/or biological records or processes that can be used as examples for communication, education, and the raising of public awareness (for example, sites with complete bio-stratigraphic Quaternary record);
 - ix. Sites where relevant intangible values are present and their existence is strongly linked with the maintenance of the ecological character of the wetland (for example, sacred sites or areas with major aesthetic values).]

Add new Box after new paragraph A3:

Box XX. Ecosystem services. Ecosystem services are the benefits people obtain from ecosystems. These include provisioning, regulating, and cultural services that directly affect people and supporting services needed to maintain the other services. (Adapted from Figure 2.1 of Millennium Ecosystem Assessment 2003. *Ecosystems and Human Well-being: A Framework for Assessment*. Island Press, Washington, DC. xiv + 245 pp.)



Guidance for the application of Criterion 2

Amend current paragraph 172 as follows, so as to remove reference to Appendices II and III of CITES (since these list those species potentially endangered by trade rather than those whose conservation may be most effectively pursued by site-based conservation measures).

172. General Objective 2.2 within this Strategic Framework urges Contracting Parties to seek to include in the Ramsar List wetlands that include threatened ecological communities or are critical to the survival of species identified as vulnerable, endangered or critically endangered under national endangered species legislation/programmes or within international frameworks such as the IUCN Red Lists or ~~the Appendices~~ [Appendix I] of CITES and [the Appendices of] CMS.

Add additional guidance after current paragraph 175:

- [A4. Be aware also of the biological importance of many karst and other subterranean hydrological systems (see specific guidance below).]

Guidelines for the application of Criterion 3

Add additional guidance after current paragraph 177:

- [A5. Be aware also of the biological importance of many karst and other subterranean hydrological systems (see specific guidance below).]

Guidelines for the application of Criterion 5

Add additional guidance after current paragraph 183:

- [A6. Criterion 5 should be applied not only to multi-species assemblages, but also to sites regularly holding more than 20,000 waterbirds of any one species.]
- [A7. For populations of waterbirds of more than 2,000,000 individuals, a threshold of 20,000 is adopted on the basis that sites holding this number are of importance under Criterion 5. To reflect the importance of the site for the species concerned, it is also appropriate to list such a site under Criterion 6.]

Add additional guidance after current paragraph 184:

- [A8. Turnover of individuals, especially during migration periods, leads to more waterbirds using particular wetlands than are counted at any one point in time, such that the importance of such a wetland for supporting waterbird populations will often be greater than is apparent from simple census information.]
- [A9. However, accurate estimation of turnover and total number of individuals of a population or population using a wetland is difficult, and several methods (e.g., cohort marking and resighting, summing increases in a count time-series) which have at times been applied do not yield statistically reliable or accurate estimates.]
- [A10. The only currently available method which is considered to provide reliable estimates of turnover is that of unique capture/marking and resighting/recapture of individually-marked birds in a population at a migratory staging site. But it is important to recognize that for this method to generate a reliable estimate of migration volume, its application usually requires significant capacity and resources, and for large and/or inaccessible staging areas (especially where birds in a population are widely dispersed) use of this method can present insuperable practical difficulties.]
- [A11. When turnover is known to occur in a wetland but it is not possible to acquire accurate information on migration volume, Parties should continue to consider recognizing the importance of the wetland as a migratory staging area through the application of Criterion 4, as the basis of ensuring that their management planning for the site fully recognizes this importance.]

Guidelines for the application of Criterion 6

Add additional guidance after current paragraph 188:

- [A12. At some sites, more than one biogeographical population of the same species can occur, especially during migration periods and/or where flyway systems of different populations intersect at major wetlands. Where such populations are indistinguishable in the field, as is usually the case, this can present practical problems as to which 1% threshold to apply. Where such mixed populations occur (and these are inseparable in the field) it is suggested that the larger 1% threshold be used in the evaluation of sites.]
- [A13. However, particularly where one of the populations concerned is of high conservation status, this guidance should be applied flexibly and Parties should consider recognizing the overall importance of the wetland for both populations through the application of Criterion 4, as the basis of ensuring that their management planning for the site fully recognizes this importance. This guidance should not be applied to the detriment of smaller, high conservation status populations.]
- [A14. Note that this guidance applies just during the period of population mixing (often, but not exclusively, this is during periods of migration). At other times, it is generally possible to assign a 1% threshold accurately to the single population that is present.]
- [A15. Turnover of individuals, especially during migration periods, leads to more waterbirds using particular wetlands than are counted at any one point in time, such that the importance of such a wetland for supporting waterbird populations will often be greater than is apparent from simple census information. For further guidance on estimation of turnover see the guidance under Criterion 5, paragraphs A8-A11.]

Add new Criterion and guidelines

[Specific criterion based on other taxa]

[Criterion 9:

A wetland should be considered internationally important if it regularly supports 1% of the individuals in a population of one species or subspecies of wetland-dependent non-avian animal species.

Long-term target for the Ramsar List:

- A16. To have included in the Ramsar List all wetlands which regularly support 1% or more of a biogeographical population of one non-avian animal species or subspecies.

Guidelines for the application of Criterion 9

- A17. When Contracting Parties are reviewing candidate sites for listing under this Criterion, greatest conservation value will be achieved through the selection of a suite of sites that hold populations of globally threatened species or subspecies. Refer also to paragraph [44] above, "Species presence in perspective", and paragraph [52] above, "Complementary international frameworks". Consideration may also be given to turnover

of individuals of migratory animals at migration periods, so that a cumulative total is reached, if such data are available (see guidance in paragraphs [A8-A11]).

- A18. To ensure international comparability, where possible, Contracting Parties should use the international population estimates and 1% thresholds provided and regularly updated by IUCN's Specialist Groups through the IUCN Species Information Service (SIS) and published in the *Ramsar Technical Report* series, as the basis for evaluating sites for the List using this Criterion.
- A19. Only species or subspecies for which reliable population estimates have been provided and published (paragraph A18) should be included in the justification for the application of this Criterion. Where no such information exists, Contracting Parties should give consideration to designation for important non-avian species under Criterion 4. For better application of this Criterion, Contracting Parties should assist, where possible, in the supply of such data to the IUCN-Species Survival Commission and its Specialist Groups for the future updating and revision of international population estimates.]

ANNEX 1

[COP9 DOC. 17] Information Paper

Rationale for the proposed changes to the Strategic Framework and guidelines for the selection of Ramsar sites

Background

1. This Information Paper, prepared by the Scientific and Technical Review Panel's Working Group 4 (Ramsar site designation), provides the rationale for the Panel's proposals to COP9 on amendments and additions to the *Strategic Framework and guidelines for the further development of the List of Wetlands of International Importance*.
2. This area of the STRP's 2003-2005 Work Plan was developed to respond to Action 17.1.5 of the Ramsar Strategic Plan 2003-2008, actions for the STRP in COP8 Resolution VIII.10, and requests from the 6th meeting of the Conference of the Parties to the Convention on Biological Diversity (CBD) in relation to Ramsar/CBD joint work on inland waters (Decision VI/4) and coastal and marine ecosystems.
3. COP7 of the Convention on Biological Diversity (CBD), in Decision VII/4 (paragraph 29) *inter alia* invited:

“the Secretariat of the Ramsar Convention and the Scientific and Technical Review Panel of the Ramsar Convention, in collaboration with the Executive Secretary and the Subsidiary Body on Scientific, Technical and Technological Advice, respectively, and in line with paragraph 30 of resolution VIII.10 of the Conference of the Parties to the Ramsar Convention, and with a view to achieving a more comprehensive coverage of components of biological diversity through the designation of Ramsar sites:

 - (a) To further elaborate the guidelines on existing criteria for the following features:
 - (i) Wetlands supporting wild relatives of domesticated or cultivated species;
 - (ii) Wetlands that support species or communities and genomes or genes of economic, social, scientific or cultural importance;
 - (iii) Wetlands supporting species or communities that are important for research into the conservation and sustainable use of biological diversity including indicators of ecosystem health and integrity; and
 - (iv) Wetlands that support important populations of taxonomic groups with wetland-dependent species, including, *inter alia*, amphibians;
 - (b) To consider the development of additional criteria, including, as appropriate, quantitative criteria;
4. The rationale set out in this Information Paper covers in particular STRP's proposals for:

- i. amendment of Ramsar site designation Criterion 1 and expansion of its supporting guidelines to cover all types of wetland ecosystem services, including in relation to cultural and socio-economic importance;
 - ii. expansion of the guidelines for the application of waterbird Criteria 5 and 6; and
 - iii. the creation of a new quantitative Criterion for non-avian wetland-dependent animal species (Criterion 9)
5. References in this paper to sections and paragraphs of the *Strategic Framework* are to those in Ramsar Wise Use Handbook 7, 2nd edition (“Designating Ramsar sites”), available at http://ramsar.org/lib_handbooks_e07pre.doc, which provides the consolidated text of the original *Strategic Framework* adopted by COP7 and the additional elements of guidance adopted by COP8.

I. Rationale for amendments to Criterion 1 and its guidelines

4. Resolution VIII.10 of the Ramsar Convention’s COP8:
- “INSTRUCTS the Scientific and Technical Review Panel (STRP), with the assistance of the Ramsar Bureau, interested Contracting Parties, and other relevant organizations to develop, for consideration at COP9, additional criteria and guidelines for the identification and designation of Ramsar sites concerning socio-economic and cultural values and functions that are relevant to biological diversity, as listed in Annex 1 of the Convention on Biological Diversity, which would be applied on each occasion in conjunction with one or more existing criteria for the identification and designation of Ramsar sites; and to include in this work a full analysis of the implications for Contracting Parties of the implementation of such criteria for the management of Ramsar sites, including Contracting Party obligations and responsibilities.”
5. In response to Resolution VIII.10, the STRP have:
- a) reviewed the potential for establishing new site selection criteria and guidelines related to the selection of wetlands of international importance on the basis of their cultural and socio-economic importance;
 - b) reviewed the obligations for Contracting Parties that might arise from such criteria; and
 - c) considered the issue of defining thresholds of international importance in this context.
6. The STRP have assessed the potential for the development of additional criteria for the identification and designation of Wetlands of International Importance based upon their cultural and socio-economic importance. This issue is complicated by the fact that many designated wetlands exist within landscapes in which people and wetlands interact at varying temporal and spatial scales such that:
- a) cultural values and socio-economic activities are influenced by the ecological character of wetland ecosystems; and
 - b) the ecological character of wetland ecosystems can, in turn, be influenced by cultural values and socio-economic activities of dependent human communities (such as is shown by the following examples in Box 1).

BOX 1. Examples of designated Ramsar sites whose ecological character is dependent of the maintenance of cultural and socio-economic activities

Algeria: Oasis de Ouled Saïd (Ramsar Site 1060, designated under Criterion 1 only).

This oasis is a type of wetland rarely designated to the List of Wetlands of International Importance. Ouled Saïd Oasis, with its *foggara* channels and rational use of water, its ancestral social organization and its ancient ksar (medieval fortresses), is an example of the application of wise water management.

France: Marais du Cotentin et du Bessin, Baie des Veys (Ramsar Site 516, designated under Criteria 1, 2, 3, 5 and 6).

This is an exceptional wetland in terms of size and ecological diversity. It is a good representative example of a western European coastal wetland, with its wet meadows along the coast. Many habitats have maintained much of the ecological integrity they inherited from centuries of balancing between a natural environment and human activities

Sri Lanka: Annaiwilundawa Tanks Sanctuary (Ramsar Site 1078, designated under Criteria 1, 2, 3, 4, 7 and 8).

As an ancient cascading tank system that dates back to the 12th century, the site is a unique wetland to the Indian region. The ancient traditional rice fields that surround it also contribute to the maintenance of wetland biodiversity.

7. The proposed updated definition of ‘ecological character’¹ [COP9 DR1- Annex A] and the Millennium Ecosystem Assessment synthesis report to the Ramsar Convention² both highlight the rôle that wetlands play in providing a range of services to human populations. Ecosystems are complexes of living communities (including humans as an integral part) and the non-living environment (Ecosystem Components), interacting (through Ecological Processes) as a functional unit to provide various benefits to people (Ecological Services).
8. Ecosystem services include provisioning, regulating and cultural services that directly affect both people and the supporting services needed to maintain the other services (see Box 2). The current application of Criterion 1 recognizes this, through its specific guidance for the selection of wetlands of importance for hydrology — a response to Article 2.2 of the Convention which states that “wetlands should be selected for the List on account of their international significance in terms of ecology, botany, zoology, limnology or hydrology.”
9. Thus Criterion 1 already encourages the selection of sites on the basis of ecosystem services, notably regulating services (hydrology) and supporting services (biodiversity), but the guidelines for the application of Criterion 1 adopted in the Annex to Resolution VII.11 do not cover consistently all types of ecosystem service listed in Box 2.

¹ STRP propose that Ecological Character is redefined as:
“the combination of the ecosystem components, ecological processes and ecosystem services that characterize the wetland at a given point in time.”

² Finlayson, C.M., D’Cruz, R. & Davidson, N.C. (eds.) 2005. *Synthesis report. Wetlands and water: ecosystem service and human well-being*. Millennium Ecosystem Assessment. XXX pp.

BOX 2. The Millennium Ecosystem Assessment (MA) classification of ecosystem services in relation to wetlands (from MA *Synthesis report. Wetlands and water: ecosystem service and human well-being*).

Ecosystem services include:

Provisioning services (including, for example, food, freshwater, biochemical products, genetic sources, fibre and fuel);

Regulating services (including, for example, climate regulation, hydrological regimes, reduction of natural hazard risks, pollution control and detoxification processes, and erosion protection);

Cultural services (including, for example, educational, aesthetic, recreational, spiritual and inspirational). Note that cultural services may include both material and non-material values, benefits and functions as described in Ramsar COP8 DOC. 15 (*Cultural aspects of wetlands*); and

Supporting services (including, for example, primary production, soil formation, pollination and nutrient cycling).

Note that the above terms include elements previously defined by the Ramsar Convention as either ‘values’, ‘functions’ or ‘services’, and that the use of the term ‘seVICES’ are taken throughout this paper to include these other descriptors.

I.1 Selection of sites for their cultural importance is already possible in the context of the application of Criterion 1, and guidance to explain this has been developed

10. Issues of cultural values and socio-economic activities are also implicitly recognized in Ramsar’s existing site selection guideline concerning the application of Criterion 1 (paragraph 168), particularly as it relates to the ecological rôle of wetlands:

“168. Objective 1 and, in particular 1.2 (paragraph 10 above), indicates that another consideration under this Criterion [1] is to give priority to those wetlands which play a substantial **hydrological, biological or ecological** rôle³ in the natural functioning of a major river basin or coastal system.”

11. Accordingly, there is benefit from more explicitly highlighting the existing possibilities for the selection of Ramsar sites for ecosystem services (including cultural values and sustainable socio-economic activities) through the application of Criterion 1. This would better reflect (for some wetlands) the mutual dependencies between ecosystem components, ecological processes and ecosystem services (including cultural values and socio-economic activities) that occur at wetlands without the need to develop a new site selection criterion.
12. Expanded guidance for application of Criterion 1 in this context is thus proposed in COP9 DR1 – Annex D.

I.2 The issue of “naturalness” and Criterion 1

³ Bold emphasis added. Note that in this context the hydrological, biological, or ecological rôle referred to includes ecosystem components, ecological processes and ecosystem services amongst which are sustainable socio-economic activities and cultural values.

13. Currently, Criterion 1 uses the term “natural or near-natural wetland type” as the basis for selecting sites for designation. However, some countries now have only highly modified landscapes as a result of historical anthropogenic impacts. In these situations, there may be few, or no, natural or near-natural wetlands. Given that some countries may have very limited potential to designate natural or near-natural wetlands, it is proposed accordingly to change the reference in Criterion 1 from “near-natural” to “most-natural”. This emphasizes that Criterion 1 may still be applied within modified landscapes, but that its application should still be such as to select the ‘best’ available sites within any national area of search, irrespective of absolute degree of naturalness (in the sense of guideline paragraph 167.iii⁴).

Accordingly, the following change to Criterion 1 is proposed:

Criterion 1: A wetland should be considered internationally important if it contains a representative, rare, or unique example of a natural or ~~near-~~ [most]-natural wetland type found within the appropriate biogeographic region.

I.3 An assessment of current Contracting Party obligations in the context of cultural and socio-economic criteria

14. COP8 (Resolution VIII.10) requested “a full analysis of the implications for Contracting Parties of the implementation of such criteria for the management of Ramsar sites, including Contracting Party obligations and responsibilities.”
15. There are three types of obligations that have already been assumed by Contracting Parties relevant to the selection of Ramsar sites on grounds of their cultural and socio-economic values and functions:
- a) a requirement to maintain the ecological character of Ramsar sites;
 - b) reporting obligations; and
 - c) management planning and wise-use obligations.

A. Maintenance of ecological character

16. Contracting Parties have assumed obligations (under Resolutions V.2, VI.1, and VIII.8, and the Ramsar Strategic Plan 2003-2008, all as related to Article 3 of the Convention) to strive to maintain, as far as possible, the ecological character of Ramsar sites, using management planning and other policy tools.
17. If Criterion 1 and the guidance for its application are amended, as proposed above, so as to encourage the selection of sites on the basis of their ecosystem services, and were a Contracting Party to highlight, in its application of Criterion 1, specific internationally important cultural and/or sustainable socio-economic values and functions of a site, then there would be an obligation to maintain the ecological character of the site such that the specified ecosystem services were maintained.

⁴ “167.iii. for each wetland type within each biogeographic region, identify for designation under the Convention those sites which provide the best examples...”

18. Note, however, that:
- a) the obligation to maintain any cultural and socio-economic values and functions would apply only to those sites where these were specifically highlighted as grounds for site qualification under Criterion 1. This would not apply to those sites, previously designated using Criterion 1, where these ecosystem services were not specifically highlighted by the Contracting Party. Thus, any additional maintenance obligation lies at the discretion of the Contracting Party; and
 - b) such maintenance of ecological character to sustain the features of a Ramsar site's international importance is no different, in principle or practice, to obligations that already exist for these sites. The only substantive change would be that, through highlighting the rôle of specific provisioning, regulating, cultural and/or supporting services as grounds for selection of a Ramsar site under Criterion 1, a Contracting Party would give clearer expression to the need for appropriate management actions (see below) to sustain the specified ecosystem services as part of the ecological character of the site, and thus promote its wise use.

B. Reporting obligations

19. Reporting on issues of cultural and socio-economic importance on Ramsar sites already occurs in the context of:
- a) triennial national reports (Resolution II.1 and subsequently); and
 - b) Ramsar Information Sheets (RIS) and their required updates (Resolution V.3 and subsequently).
20. For the RIS, in principle, the obligation to report on issues of cultural and socio-economic importance already exists, since this is the subject of RIS section 21.
21. If Criterion 1 and the guidance for its application are amended as proposed, in order to more clearly stress the possibilities for the selection of Ramsar sites on the basis of their provisioning, regulating, cultural and/or supporting services, no new reporting obligations would be created.

C. Management planning and wise-use obligations

22. Existing management guidance for Ramsar sites and other wetlands (Resolution V.7 and subsequently as related to Article 3.1 of the Convention, notably Resolution VIII.14) already strongly stresses the importance of cultural and socio-economic considerations in the context of working with local stakeholders. In addition, Resolution VIII.19 established '*Guiding principles for taking into account the cultural values of wetlands for the effective management of sites*' which gave explicit guidance to Contracting Parties.
23. If Criterion 1 and the guidance for its application is amended, and where a site is cited as of importance for their provisioning, regulating, cultural and/or supporting services, there would be a firmer expectation that the management objectives for the sites would need to support the maintenance of these specified services. Again, the assumption of this obligation lies with the Contracting Party choosing to designate the site in this way.

24. It would be for any Contracting Party to establish whether these management objectives are compatible with the objectives set for maintenance of ecological aspects of a site's importance, and to take appropriate action if they are not so compatible. Fundamentally, however, no new obligations would be created for the management of those Ramsar sites identified on the basis of their cultural or sustainable socio-economic services, or any other services.

I.4. Defining *international* importance in the application of Criterion 1

25. A key issue in the application of Criterion 1 and its revised guidance is how to define levels of *international* importance (as opposed to other levels of importance, such as national or local importance).
26. Precise definitions are problematic given the global scope of the Convention and thus of its selection criteria and associated guidance. To this end, the proposed new guidance associated with Criterion 1 highlights the need for proportionality in the application of Criterion 1.
27. Ultimately, it will be for a Contracting Party to assess whether the extent or degree of provisioning, regulating, cultural and/or supporting services provided to maintain the ecological character of any particular wetland is sufficient to justify its designation as a wetland of *international* importance under Criterion 1.
28. It may be possible that more detailed guidance can be elaborated in the future on the basis of experience gained from the application of the revised Criterion 1. Accordingly, it would be valuable for Contracting Parties choosing to apply Criterion 1 in this way to provide information on their experiences to the STRP.

I.5 Summary

29. The following nine points summarise the rationale for the proposed amendments to Criterion 1:
- i. As part of the STRP's work to revise terminology used by the Convention, it is proposed that COP9 adopt in [COP9 DR1 – Annex A] a revised definition of the term 'ecological character' which corresponds with other international practice and more clearly indicates that various 'ecosystem services' are an integral part of ecological character.
 - ii. Ecosystem services include cultural values and sustainable socio-economic activities in the sense of Resolution VIII.10.
 - iii. The application of Criterion 1 of the Convention already encompasses hydrology as an ecosystem service (both as a provisioning and regulating service) with specific guidance given to that effect.
 - iv. It is accordingly logical, in the light of Resolution VIII.10, to expand the potential application of Criterion 1 to include within its scope other provisioning services (sustainable socio-economic activities) as well as cultural services (= cultural values *sensu* Res. VIII.10).

- v. Accordingly, the STRP considers that Criterion 1 can already be used to select sites of international importance for a broader range of their ecosystem services than has generally been applied so far.
- vi. Contracting Party obligations for site management following the designation of a site under Criterion 1 relate to the grounds for qualification stated on the Ramsar Information Sheet.
- vii. If a Contracting Party highlights that specific cultural values and sustainable socio-economic activities are important ecosystem services when designating a Ramsar site (or revising a Ramsar Information Sheet for a designated site), then there would be an expectation that such ecosystem services would need to be maintained in order to maintain the ecological character of the site.
- viii. Such an obligation would **not** exist for sites already designated under Criterion 1 unless a Contracting Party had explicitly indicated that specified cultural values and sustainable socio-economic activities were included in the grounds for qualification under Criterion 1.
- ix. Finally, a minor modification of the wording of Criterion 1 is being proposed which would better allow its application in anthropogenically (culturally) modified landscapes.

II. Rationale for additional guidance for applying Criteria 5 and 6

30. Ramsar Criteria 5 and 6 (the two quantitative Criteria for waterbirds) are among the most frequently applied of the Ramsar site selection criteria. A small number of issues in the application of these Criteria have arisen in recent years, for which additional guidance on their application would be desirable.
31. These relate to:
 - the issue of population turnover (especially during migratory periods) in assessing the total number of individual waterbirds using a site;
 - the definition of the term “assemblage”;
 - the selection of appropriate 1% thresholds (Criterion 6) where more than one population of the same species may occur on a site simultaneously; and
 - the selection of 1% thresholds (Criterion 6) for very large populations.
32. New guidance addressing each these issues has been prepared by the STRP and is proposed for inclusion in the revised *Strategic Framework*.

III. Rationale for a quantitative Criterion for non-avian taxa – new Criterion 9

33. The Convention’s “1%” criterion (Criterion 6) has been an effective means of identifying Wetlands of International Importance since its adoption early in the life of the Convention (Heiligenhafen conference, 1974).

34. There is no fundamental biological reason to take 1% of a population of waterbirds as the threshold level for establishing the international importance of a site. However, this percentage has been found by long experience and evaluation to give an appropriate degree of protection to waterbird populations and to assist in the definition of ecologically sensible sites. In addition to its formal adoption by Ramsar's Contracting Parties, the criterion has gained wide acceptance throughout the world, in a range of other conservation science contexts.
35. The application of this Criterion is recognized as working only for those waterbirds that tend to concentrate during at least one stage in their annual cycle. This is also a desirable feature because those species that congregate will, by definition, be those dependent on a relatively small proportion of the total territory and therefore be vulnerable to changes to that limited area in which they occur. Aggregating species also tend to be those with specialised ecological requirements which will usually be met at a limited number of locations that are traditionally (regularly) used.
36. The application of this criterion depends both on having data on numbers of waterbirds using a particular site and on being able to calculate the proportion that this comprises of an overall biogeographic (international) population.
37. Similar constraints will apply to any equivalent quantitative Criterion for non-avian taxa (Stroud 2005⁵). It will work effectively in some circumstances (for some species) and be ineffective in others (certainly for similar reasons, but probably others as well). Its lack of complete efficiency is not a fundamental problem: complete efficiency for *all* non-avian species would not be expected, as similarly, Criterion 6 is not effective for *all* waterbirds (or arguably even *most* waterbird populations).
38. One of the elements in STRP's work plan for 2002-2005 was to explore whether it is feasible to extend this quantitative percentage of population concept to other taxa, probably in the first instance to some taxa of wetland animals. This follows from previous reviews of the potential for a non-avian quantitative criterion at Ramsar's COP3 in 1986, COP4 in 1990 and COP5 in 1993 (STRP 2005).
39. Decision VII/4 of the CBD's COP7 invited the Secretariat of the Ramsar Convention and Ramsar's STRP to, *inter alia*:
- a) further elaborate the guidelines on existing criteria for the following features:
 - iv) Wetlands that support important populations of taxonomic groups with wetland-dependent species, including, *inter alia*, amphibians; and
 - b) consider the development of additional criteria, including, as appropriate, quantitative criteria.
40. **STRP's assessment has concluded that a 1% criterion for certain non-avian taxa would be a feasible, and useful, addition to Ramsar's site selection criteria.**

⁵ Stroud, D.A. 2005. The application of Ramsar's 1% criterion and the development of a quantitative criterion for selection of Ramsar sites for non-avian taxa. *Ramsar Technical Report* No. XX. xx pp.

41. A key element to the success of Criterion 6 for waterbirds has been the availability of peer-reviewed assessment of the size of biogeographic populations. These reviews were considered in an *ad hoc* way at early Ramsar COPs. An international workshop in 1995 made recommendations as to the formalization of the review process, and these were endorsed by COP6 in 1996 (Resolution VI.4). The *Waterbird Population Estimates* series published in 1994, 1997 and 2002 by Wetlands International have since provided a global collation of waterbird population sizes and recommended 1% thresholds for use in the application of Criterion 6. *Waterbird Population Estimates* is proposed to be updated for each COP as a standing report in the context of Article 6.2(e) of the Convention.
41. Two important principles for developing a quantitative non-avian Criterion are that:
- i. as for the waterbird 1% thresholds, it is important that (for greatest cost-effectiveness) any process established to support a new Criterion 9 should capitalise on existing international data collection and collation mechanisms for the relevant taxa; and
 - ii. any newly established processes should follow general principles already established for processes of updating 1% thresholds for the application of Criterion 6 (e.g., the importance of consultation and peer review prior to adoption, audit trails for data sources, and frequency of update).
42. The following process is recommended in STRP's proposals to COP9:
- i. Adoption at COP9 of a new Criterion 9 for the selection of Wetlands of International Importance on the basis of their importance for 1% of a biogeographical population of certain wetland-dependent non-avian animal taxa. The proposed new Criterion 9 is that:

“A wetland should be considered internationally important if it regularly supports 1% of the individuals in a population of one species or subspecies of wetland-dependent non-avian animal species”.
 - ii. The Criterion should be applied only to those species and populations for which reliable population size data is available and published, and so for which a 1% threshold can be recommended. A list of these 1% thresholds should be compiled and published as a *Ramsar Technical Report* so as to be fully available to Contracting Parties and others involved in identification and designation of Ramsar sites. The content of this report will accordingly be restricted to a selection of wetland dependent fauna.
 - iii. For COP10 (and subsequent COPs), the production (by IUCN-Species Survival Commission's Specialist Groups and coordinated by the STRP) of a significantly expanded list of animal species with 1% thresholds should be prepared for publication as a *Ramsar Technical Report*.
 - iv. The content of these *Reports* will thus define the taxonomic scope of application of the proposed new Criterion.

- v. This *Ramsar Technical Report* would be updated for each future COP, both in terms of revision of data on species and populations already listed and of the addition of new species and populations for which new data and information have become available. As for *Waterbird Population Estimates*, this update process would include international consultation as to the best available estimates for the taxa concerned - and thus be internationally peer-reviewed.
- vi. It is envisaged that IUCN-SSC and its Specialist Groups will take a leading rôle in this triennial update process as follows:
 - a. Where new data become available, there are now annual updates of the IUCN Red List using evaluations undertaken by IUCN-SSC SGs. There is a decadal process now in place to systematically review and update status information on major taxonomic groups (e.g., mammals, amphibians). This update frequency is similar to the nine-year update cycle established by the Ramsar Convention for waterbird 1% thresholds.
 - b. Information supporting IUCN's review process should be available via its Species Information Service (SIS), which will represent an internationally peer-reviewed source of 'best-estimates' derived from the work of relevant Specialist Groups.
 - c. Although currently under development, IUCN's SIS will be in a position to output relevant estimates in advance of Ramsar COPs for the COP10 update of Criterion 9's supporting *Ramsar Technical Report*.
 - d. A small amount of time will be required to handle coordination of the update process for the *Ramsar Technical Report* in terms of receiving and publishing outputs already collated by the SIS a suitable period in advance of a COP. This can be assumed as an ongoing STRP task.
 - e. There are a range of options for the publication of population data to support Criterion 9 ranging from minimal cost (a Web-published .pdf format list) to more a expensive hard-copy publication (c.f. *Waterbird Population Estimates*). In the first instance, dissemination of supporting estimates and thresholds via a Web-published, minimally formatted *Ramsar Technical Report* is recommended (see Annex 2 of this document).

ANNEX 2

Draft Ramsar Technical Report No. xx

Population estimates and 1% thresholds for non-avian wetland-dependent animal species for the application of Ramsar Criterion 9 in the identification and designation of Wetlands of International Importance for the period 2005-2008

Prepared by Working Group 4 of Ramsar's Scientific and Technical Review Panel, in association with the IUCN Species Survival Commission (SSC)

Introduction

As part of its work during 2003-2005, the Ramsar Convention's Scientific and Technical Review Panel has developed and proposed for adoption by Ramsar COP9 (Kampala, Uganda, November 2005) a new Criterion (Criterion 9) for the identification and designation of Wetlands of International Importance. This Criterion is a numerical Criterion for non-avian wetland-dependent animals, which is the equivalent of existing Criterion 6 for waterbirds.

The proposed Criterion 9 is that: "A wetland should be considered internationally important if it regularly supports 1% of the individuals in a population of one species or subspecies of wetland-dependent non-avian animal species".

For the application of this Criterion, information on the estimated population size and hence 1% threshold for a species, subspecies or biogeographic population is necessary.

This *Ramsar Technical Report* provides an initial list of wetland-dependent animal species, subspecies and biogeographic populations for which reliable population size estimates have been published, for the application of proposed Ramsar Criterion 9. Information for this initial list largely concerns globally-threatened species, whose population size and status has been assessed, mostly as part of the IUCN Red List process. The current list includes species of Crocodylia and mammals, but it is anticipated that as and when information becomes available this will be expanded to cover other species in these taxa, including *inter alia* turtles and amphibians, whether or not they are globally threatened.

In the attached table, where population size ranges are given, the 1% threshold is derived from the mid-point of this range, other than for globally threatened species where the 1% threshold is derived, on a precautionary basis, from the population size range minimum.

For wetlands which support those species listed in this report which are globally-threatened, it is appropriate to apply Ramsar Criterion 2 in the designation of the site as a Wetland of International Importance.

The Ramsar Scientific and Technical Review Panel and the IUCN Species Survival Commission have agreed a procedure for further developing and updating this list of population estimates of non-avian wetland-dependent fauna and mega-fauna through IUCN's Web-based Species Information Service (SIS) (Decision STRP12-25). It is anticipated that further expansion of the

range of species covered may be possible for the first published version of this *Technical Report* prior to Ramsar COP9.

The approach developed for the provision of the population estimates and 1% population thresholds in this report is analogous to that undertaken by Wetlands International for waterbird populations and 1% thresholds for the application of Ramsar Criterion 6, through the publication of the regularly-updated *Waterbird Population Estimates*. A 4th edition of *Waterbird Population Estimates* is expected to be available by the time of COP9.

Order	Family	Species	Common name	Population name	Population estimate	Date of estimate	1% threshold	IUCN status	Source
Crocodylia	Alligatoridae	<i>Alligator sinensis</i>	Chinese Alligator	World population	800-1,000		8	CR	Ross (1998)
Crocodylia	Crocodylidae	<i>Crocodylus mindorensis</i>	Philippine Crocodile		500-1,000		5	CR	Ross (1998)
Crocodylia	Crocodylidae	<i>Crocodylus porosus</i>	Saltwater Crocodile	India	1,000		10		Anon. 1993
Crocodylia	Crocodylidae	<i>Crocodylus porosus</i>	Saltwater Crocodile	Myanmar	<4,000		40		Ross (1998)
Crocodylia	Crocodylidae	<i>Crocodylus porosus</i>	Saltwater Crocodile	S. Vietman & Mekong Delta	<100		1		Ross (1998)
Crocodylia	Crocodylidae	<i>Crocodylus porosus</i>	Saltwater Crocodile	Palau (Caroline Islands)	<150		1		Messel & King (1998)
Crocodylia	Crocodylidae	<i>Crocodylus porosus</i>	Saltwater Crocodile	Solomon Islands	200		2		Messel & King (1998)
Crocodylia	Crocodylidae	<i>Crocodylus rhombifer</i>	Cuban Crocodile	World population	3,000-6,000		3	EN	Ross (1998)
Pinnipedia	Otariidae	<i>Arctocephalus gazella</i>	Antarctic Fur Seal	World population	1,300,000 - 1,700,000	1990-91	15,000		MacDonald (2001)
Pinnipedia	Otariidae	<i>Arctocephalus townsendi</i>	Guadalupe Fur Seal	World population	6,000	1987	60	VU	MacDonald (2001)
Pinnipedia	Otariidae	<i>Arctocephalus philippi</i>	Juan Fernández Fur Seal	World population	12,000	1990-91	120	VU	MacDonald (2001)
Pinnipedia	Otariidae	<i>Arctocephalus galapagoensis</i>	Galápagos Fur Seal	World population	40,000	1978-1988/89	400	VU	MacDonald (2001)
Pinnipedia	Otariidae	<i>Arctocephalus tropicalis</i>	Subantarctic Fur Seal	World population	310,000	1987-1990	3100		MacDonald (2001)
Pinnipedia	Otariidae	<i>Eumetopias jubatus</i>	Steller's Sea Lion	World population	110,000	1989	1,100	EN	MacDonald (2001)
Pinnipedia	Otariidae	<i>Otaria flavescens</i>	South American Sea Lion	World population	155,000	1973-1982	1,550		MacDonald (2001)
Pinnipedia	Otariidae	<i>Neophoca cinerea</i>	Australian Sea Lion	World population	10,000-12,000		110		MacDonald (2001)
Pinnipedia	Otariidae	<i>Phocartus hookei</i>	New Zealand Sea Lion	World population	10,000-15,000	1992	100	VU	MacDonald (2001)
Pinnipedia	Odobenidae	<i>Odobenus rosmarus</i>	Pacific Walrus	<i>Odobenus rosmarus divergens</i>	200,000-250,000		2,250		MacDonald (2001)
Pinnipedia	Phocidae	<i>Monachus schauinslandi</i>	Hawaiian Monk Seal	World population	1,400		14	EN	MacDonald (2001)
Pinnipedia	Phocidae	<i>Monachus monachus</i>	Mediterranean Monk Seal	World population	400-500		4	CR	MacDonald (2001)
Pinnipedia	Phocidae	<i>Pusa (Phoca) sibirica</i>	Baikal Seal	World population	60,000-70,000	1990	650		MacDonald (2001)

Order	Family	Species	Common name	Population name	Population estimate	Date of estimate	1% threshold	IUCN status	Source
Cetacea	Lipotidae	<i>Lipotes vexillifer</i>	Baiji or Yangtze Dolphin		<30		1	CR	Reeves <i>et al.</i> (2003)
Cetacea	Platanistidae	<i>Plantanista ganetica</i>	Ganges Dolphin	<i>Plantanista ganetica ganetica</i>	<2,000		20	EN	Reeves <i>et al.</i> (2003)
Cetacea	Platanistidae	<i>Plantanista ganetica</i>	Indus Dolphin	<i>Plantanista ganetica minor</i>	c. 1,000		10	EN	Reeves <i>et al.</i> (2003)
Cetacea	Pontoporiidae	<i>Pontoporia blainvillei</i>	Franiscana or La Plata Dolphin	Rio Grande do Sul & Uruguay	42,000		420	DD	Reeves <i>et al.</i> (2003)
Perissodactyla	Tapiridae	<i>Tapirus bairdii</i>	Baird's Tapir	Mexico: Sierra Madre de Chiapas & Tehuantepec	400-1,950		4	VU	Matola <i>et al.</i> (1997)
Perissodactyla	Tapiridae	<i>Tapirus bairdii</i>	Baird's Tapir	Mexico, Belize & Guatemala	2,930 - 11,800		29	VU	Matola <i>et al.</i> (1997)
Perissodactyla	Tapiridae	<i>Tapirus bairdii</i>	Baird's Tapir	Costa Rica & Panama	1,200- 1,500		12	VU	Matola <i>et al.</i> (1997)
Artiodactyla	Hippopotamidae	<i>Hippopotamus amphibius</i>	Hippopotamus	Western Africa	7,700	1988-89	77		Eltringham (1993a) MacDonald (2001)
Artiodactyla	Hippopotamidae	<i>Hippopotamus amphibius</i>	Hippopotamus	Eastern Africa	79,500	1988-89	795		Eltringham (1993a) MacDonald (2001)
Artiodactyla	Hippopotamidae	<i>Hippopotamus amphibius</i>	Hippopotamus	Southern Africa	86,400	1988-89	864		Eltringham (1993a) MacDonald (2001)
Artiodactyla	Hippopotamidae	<i>Hexaprotodon liberiensis</i>	Pygmy Hippopotamus	<i>Hexaprotodon liberiensis liberiensis</i> (Sierra Leone)	70-90		7	VU	Eltringham (1993b)
Artiodactyla	Cervidae	<i>Cervus duvauceli</i>	Swamp Deer/ Barasingha	<i>Cervus duvauceli duvauceli</i> (India/Nepal)	5,400-6,400	1995	54	VU	Wemmer (1998)
Artiodactyla	Cervidae	<i>Cervus duvauceli</i>	Swamp Deer/ Barasingha	<i>Cervus duvauceli branderi</i> (India)	450-550	1986	45	EN	Wemmer (1998)
Artiodactyla	Cervidae	<i>Cervus duvauceli</i>	Swamp Deer/ Barasingha	<i>Cervus duvauceli ranjitsinbi</i> (India)	350-400	1994	35	CR	Wemmer (1998)
Artiodactyla	Cervidae	<i>Blastocercus dichotomus</i>	Marsh Deer	Brazil	41,000	?1995	410	VU	Wemmer (1998); P (1995)
Artiodactyla	Cervidae	<i>Blastocercus dichotomus</i>	Marsh Deer		<2,000		20	VU	Wemmer (1998)

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