Convention on the Conservation of Migratory Species of Wild Animals (CMS)

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IMPACT ASSESSMENT AND MIGRATORY SPECIES

Follow-up to CMS Resolution 7.2 DEVELOPING GUIDELINES FOR CMS

(*Prepared by the Secretariat*)

1. Reference is made to CMS COP Resolution 7.2 addressing impact assessment and migratory species. Resolution 7.2 requests the CMS Scientific Council, in cooperation with the International Association for Impact Assessment (IAIA), the Ramsar Convention, the CBD and other suitable qualified bodies, to:

- Review existing international guidance in the field of Environmental Impact Assessment (EIA);
- Identify gaps in relation to migratory species interests; and
- Develop, if necessary, further guidance relating to migratory species issues for consideration and possible adoption by the COP at its eighth meeting.

2. To support the Scientific Council's work, the CMS Secretariat has appended to this note a consolidated version of a larger study undertaken by Mr Cameron Kelly (Australia), a CMS research fellow who was with the CMS Secretariat in late 2003. Earlier drafts of the study had been shared with the CBD Secretariat, the Ramsar Bureau, Wetlands International, BirdLife International and the IAIA for comment.

3. The Scientific Council is invited to consider the paper and the recommendations made in Section 4 and to recommend what further action should be undertaken.

Impact Assessment and Migratory Species:

Gaps in Existing Guidance and Recommendations for future CMS Action

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Introduction

In Resolution 7.2, the Seventh Meeting of the Conference of the Parties (COP) to the Convention on Migratory Species (CMS) emphasized that avoidable detriment to migratory species often occurs as a result of inadequate prior assessment of the potential environmental impacts of projects, plans programmes and policies. The ultimate aim of Resolution 7.2 is to ensure that migratory species considerations are integrated into impact assessment (IA) procedures: (1) environmental impact assessment (EIA) and (2) strategic environmental assessment (SEA).

Migratory species are shared biological resources. They are especially unique because actual or potential threats in one Range State can have ramifications throughout a species' migratory range. Consequently, the nature of transboundary movements of migratory animals along their migration range means that in addition to adequate review of species-related impacts within a Range State, IA procedures must have a transboundary dimension. Resolution 7.2 recognises that international cooperative efforts promulgated through international instruments such as CMS can help to ensure this.

Resolution 7.2 requests the CMS Scientific Council, in cooperation with the International Association for Impact Assessment, the Ramsar Convention, the CBD and other suitable qualified bodies, to:

- Review existing international guidance in the field of IA;
- Identify gaps in relation to migratory species interests; and
- Develop, if necessary, further guidance relating to migratory species issues for consideration and possible adoption by the COP at its eighth meeting.

At least a dozen different international instruments deal in one way or another with IA. While these instruments were reviewed as part of this study, this paper addresses only the instruments and provisions of the Convention on Biological Diversity (CBD) and the Ramsar Convention. These provide useful guidance on IA that could be adopted and complemented by CMS to fit the needs of migratory species.

The purpose of this paper is to identify gaps in the existing IA guidance with regard to migratory species, and to make some recommendations on action that CMS could take regarding the development of migratory species-related guidelines for IA.

Section one provides an overview of relevant CMS, CBD and Ramsar provisions addressing IA. Section two evaluates existing guidance and first identifies gaps in relation to both biodiversity and migratory species. It then defines the necessary adaptations of guidance and instruments in relation to migratory species and makes recommendations to develop migratory species-specific guidance for IA. Section three discusses the special characteristics of migratory species that could be considered in an IA procedure that addresses impacts to migratory species. Section four provides some conclusions and summarises the recommendations made to the Scientific Council.

Section 1: International Instruments and Guidance on Impact Assessment

1.1 Convention on Migratory Species

The Convention text does not explicitly mention IA. However, the application of IA procedures to support the Convention's implementation is implied in a number of provisions. The relevant provisions include:

- **Article I (1)(c)** (on the definition of "favourable conservation status" which includes a reference to likely future trends in population, range and habitat of species);

- **Article II (2)** (on avoiding endangerment of migratory species);

- **Article III (4)** (on protection of Appendix 1 species, their habitats and addressing barriers to migration and the threats posed by other factors); and

- **Article IV (4)** (in respect of elements to be included under CMS Agreements concluded in respect of Appendix II and other species).

CMS Resolution 7.2 recognises that meeting the preceding provisions implies the use of IA. It also provides additional guidance. The resolution:

- Notes that most Parties would benefit from international harmonization of guidance on environmental assessment principles;

- Notes that CBD Decision IV/10c (Impact Assessment and Minimization of Adverse Effects) specifically encourages collaboration between CBD, CMS and, *inter alia*, the International Association for Impact Assessment (IAIA);

- Welcomes the endorsement by CBD COP6 of the "*Guidelines for Incorporating Biodiversity–related Issues into Environmental Impact Assessment Legislation and/or Processes and in Strategic Environmental Assessment"* annexed to CBD COP Decision VI/7;

- Urges that EIA and SEA, where relevant, should include as complete a consideration as possible of effects on migratory species that are of special relevance to the Convention in this context, mention is made of impediments to migration in Article III (4)(b) and also to transboundary effects) (para 2).

- Requests the CMS Secretariat to establish cooperative links with the IAIA in furtherance of matters specified in the Resolution (para 4).

- Encourages Parties to establish contact with relevant national focal points from within the networks of the IAIA with a view to identifying sources of expertise and advice for assisting with migratory species–related impact assessment procedures (para 6).

- Further requests the Scientific Council *inter alia* to "review existing international (EIA) guidance…identify gaps…and if necessary, develop further guidance relating to migratory species interests" (para 7).

1.2 The Convention on Biological Diversity

The CBD identifies IA as a key tool to achieve the conservation of biodiversity and the sustainable use of its components. Article 14 requires CBD Contracting Parties to:

- Introduce appropriate procedures requiring EIA of proposed projects that are likely to have significant adverse effects on biological diversity with a view to avoiding or minimizing such effects, and, where appropriate, allow for public participation in such procedures;

- Introduce appropriate arrangements to ensure that the environmental consequences of its programmes and policies that are likely to have significant adverse impacts on biological diversity are duly taken into account; and

- Promote, on the basis of reciprocity, notification, exchange of information and consultation on activities under its jurisdiction or control which are likely to significantly adversely affect the biological diversity of other States or areas beyond the limits of national jurisdiction, by encouraging the conclusion of bilateral, regional or multilateral arrangements, as appropriate.

Although the last point may not have been conceptualised with migratory species in mind, its transboundary scope and emphasis on international cooperative activities provide a strong basis for the CBD's Parties to address migratory species even if they are not Parties to CMS.

Other CBD provisions also provide a basis for planning-oriented tools such as EIA and SEA. These include:

- Article 6(b): integrate biodiversity–related considerations into sectoral and cross - sectoral plans, programmes and policies;

- Article 7(c): identify and monitor processes and categories of activities that may have significant impacts on the conservation of biodiversity and the sustainable use of it components; and

- Article 8(l): regulate or manage identified processes and categories of activities, where a significant adverse effect on biological diversity has been determined.

The CBD's provisions related to IA were further developed by the CBD Conference of the Parties when it adopted the "*Guidelines for incorporating biodiversity–related issues into environmental impact assessment legislation or processes and in strategic impact assessment*" ("the CBD Guidelines") (CBD COP Decision VI/7). An intersessional working group developed the Guidelines. The CBD Guidelines are found in Appendix 1 to this paper.

1.3 Ramsar Convention

The Ramsar Convention's Article 3.2 requires Parties to:

> "arrange to be informed at the earliest possible time if the ecological character of any wetland in its territory and included in the List [of Wetlands of International Importance] has changed, is changing or is likely to change as the result of technological developments, pollution or other human interference. Information on such changes shall be passed without delay to the organization or government responsible for the continuing bureau duties specified in Article 8."

Pursuant to Ramsar Article 3.1, the Contracting Parties shall formulate and implement their planning so as to promote the conservation of the wetlands included in the List, and as far as possible the wise use of all wetlands in their territory. For such a requirement to be effective, the Parties need to identify specific activities, policies, plans and programmes that are likely to impact on wetlands for the purposes of screening proposals.

Ramsar has done much work in the field of EIA to further develop the Convention's provisions. It started considering the issue in 1996. This work provided the basis for a decision by Ramsar COP 8 to adopt the "*Guidelines for incorporating biodiversity – related issues into environmental impact assessment legislation and/or processes and in strategic environmental assessment adopted by the Convention on Biological Diversity (CBD) and their relevance to the Ramsar Convention*" ("the Ramsar Guidelines") (Ramsar COP8, Resolution VIII (9,10).

Ramsar's Scientific and Technical Review Panel (STRP) had earlier reviewed the CBD Guidelines and recommended that they were fully appropriate for application to impact assessment concerning wetlands in the Ramsar context. The STRP in effect prepared supplementary guidance to assist Ramsar Parties in applying the CBD Guidelines to impact assessment on wetlands. The Ramsar adaptations to the CBD Guidelines have been inserted into the original text and are depicted as boxed italic text in the relevant sections of the CBD Guidelines.

The Ramsar Guidelines can be found in Appendix 2 of this paper. They reflect Ramsar's approach in avoiding duplication of effort in the process to create new wetlands-oriented IA guidelines. This could provide a model for CMS.

Section 2: Evaluating Existing Impact Assessment Guidance in Relation to Migratory Species

2.1 Introduction

Impact assessment is a process that aims to involve both interested and affected individuals in the outcome of development proposals. It has been described as:

> *"A process to improve decision-making and to ensure that the project/programme options under consideration are environmentally and socially sound and sustainable. It is concerned with identifying, predicting, and evaluating the foreseeable impacts, both beneficial and adverse, of public and private (development) activities, alternatives and mitigating measures, and aims to eliminate or minimise negative impacts and optimise positive impacts.*"[1]

"Impact assessment" is a generic term that includes both environmental impact assessment (EIA) and strategic environmental assessment (SEA). Though the situation differs from country to country, EIA - impact assessment at the project level - is widely legislated and implemented (with varying degrees of success). At the programme, plan and policy levels, SEA is practiced on an *ad hoc* basis and tends to be less developed and rarely legislated. Both EIA and SEA rely on a mixture of expert–based analysis and public participation, and provide a link to the private sector as they are widely used by various industrial sectors as a tool for bringing environmental and social issues to bear in decision–making processes.

Impact assessment, in one form or another, is a topic relevant to all of the biodiversity–related conventions. Accordingly, the IA process provides an opportunity for substantive collaboration among all of them. Much attention has already been devoted to the application of IA principles and practices amongst the biodiversity–related conventions. To date, however, there has been little (or no) equivalent articulation of IA guidance specifically relating to migratory species.

Opportunities exist to influence IA procedures at two levels with regard to migratory species. First, a broad biodiversity perspective could be taken, since migratory species are components of biodiversity. Broad-based guidance, such as better integrating general biodiversity considerations into IA, should have some positive added benefit for migratory species. Second, a more specific and complementary perspective could be taken to ensure that IA procedures adequately consider migratory species and the unique characteristics that they embody.

2.1.1 EIA

Environmental impact assessment refers to the process by which the environmental impact of a project is described. The term "environment" is broadly construed and typically describes both man–made features (such as cultural heritage) and those that are naturally occurring (including water, air, land, flora and fauna).

2.1.2 SEA

Strategic Environmental Assessment (SEA) is concerned with assessment not just of single projects, but also of the (cumulative) effects of several projects, as well as the framework of programmes, plans and policies within which they are promoted.[2] Most importantly in the context of this paper, SEA can provide an appropriate framework for incorporating biodiversity issues - including migratory species - into planning and decision-making. This fact has been recognized by a number of countries and organizations around the world.[3]

SEA complements a number of the shortcomings of EIA in that it addresses a greater range of potential impacts on projects, including:

- *Induced* impacts of projects (where one project may stimulate other development);

- *Synergistic* impacts (where the impact of several projects may exceed the sum of the individual project impacts); and

- *Global* impacts (such as biodiversity loss and climate change).

2.2 Evaluating the incorporation of biodiversity considerations into IA

IA processes are in place and applied in over 100 countries around the world. However, much of the literature reveals that in practice biodiversity considerations are inadequately addressed.[4] The most often cited impediments to effective incorporation of biodiversity within IA procedures include:[5]

1. Low political priority afforded to biodiversity issues in general;

2. Lack of awareness of biodiversity values and needs;

3. Inadequate acquisition and interpretation of base-line data (including information on distribution, status and threats to both species and ecosystems);

4. Lack of knowledge of ecological processes and functioning;

5. Poor knowledge on lesser–known taxonomic groups;

6. Lack of specialist capacity to carry out requisite biodiversity assessments; and

7. Lack of follow-up and post-project monitoring (largely due to the inherent uncertainties and complexities of ecosystems and the acknowledged difficulties of making reliable predictions).

These impediments are interlinked.

Insufficient attention has been paid to the application of more strategic approaches to IA (i.e. SEA) that are of particular relevance to migratory species concerns (e.g., broad geographic scales, longer timeframes and cumulative and synergistic effects).[6]

In the context of mining projects, for example, many studied examples of IA exhibit deficiencies in addressing biodiversity concerns (such as migratory species) at each stage of the IA process. Specific biodiversity factors inadequately addressed in for example mining projects were:

- Consideration of non-protected (e.g., migratory) species;

- Proper baseline surveys/data and review/use of relevant scientific literature;

- Consideration for different levels of biodiversity;

- Defined criteria to assess impact magnitude and significance;

- Consideration of structural/functional relationships;

- Consideration of full range of potential impacts, including cumulative impacts;

- Consideration of mitigation measures;

- Adequate and correct interpretation of results;

- Post–project monitoring; and

- Consideration of concerns from affected communities and other resource users.

2.2.1 World Bank reviews of biodiversity and IA

In 1995, the World Bank's East Asia Environment Unit undertook an unpublished internal review of the biodiversity components of a number of IAs. In examining several infrastructure and forestry projects, the Bank's review arrived at several conclusions:

- Quantity, quality and presentation of biodiversity information was weak;

- IA teams did not include biodiversity expertise when needed;

- Methodologies were not well presented (or not at all);

- Natural variability was not accounted for in most biodiversity studies;

- Mitigation plans were unclear; and

- Biodiversity restoration opportunities were not being exploited.

Lack of awareness and capacity to address biodiversity in IA is a cross cutting issue common to IAs and was evident throughout the World Bank's review. Awareness and capacity needs to be fundamentally improved in order to move from the theory of integrating biodiversity considerations into IA to the actual practice.

2.3 Addressing biodiversity in IA: the CBD Ecosystem Approach

The ecosystem approach, which acknowledges the CBD's three core objectives, represents a strategy for the integrated management of land, water and living resources to promote conservation and sustainable use in an equitable manner (CBD COP Decision V/6). The approach is taken to be consistent with the CBD's definition of "ecosystem": a "dynamic complex of plants, animals and their non-living environment interacting as a functional unit" (Article 2). In this view, any strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way constitutes an important framework for the integration of biodiversity in EIA and SEA. The ecosystem approach focuses on structure, processes, functions and interactions with components of biological diversity.

CBD's ecosystem approach is based on 12 inter-related guiding principles that are designed to facilitate decision-making concerning biological diversity. These principles are reproduced in Box 1.

Box 1: Guiding Principles of the CBD Ecosystem Approach

1. The objectives of management of land, water and living resources are a matter of societal choice.

2. Management should be decentralised to the lowest appropriate level. Where management is closer to the ecosystem level, this may increase responsibility, ownership, accountability, participation and use of local knowledge.

3. Ecosystem managers should consider the effects (actual and potential) of their activities on adjacent and other ecosystems. This recalls the importance of transboundary and inter-jurisdictional consultation, given that ecological boundaries rarely coincide with political ones.

4. Recognising potential gains from management, there is usually a need to understand and manage the ecosystem in an economic context. Any such ecosystem–management programmes should:

   - Reduce those market distortions that adversely affect biological diversity;
   - Align incentives to promote biodiversity conservation and sustainable use, and
   - Internalise costs and benefits in the given ecosystem to the extent feasible.

5. Conservation of ecosystem structure and function, in order to maintain ecosystem services, should be a priority target of the ecosystem approach. The rationale notes that conservation and restoration of ecological interactions and processes is of greater significance for the long-term maintenance of biological diversity than simply protection of species.

6. Ecosystems must be managed within the limits of their functioning.

7. The ecosystem approach should be adopted at appropriate spatial and temporal scales.

8. Recognising the varying temporal scales and lag-effects that characterize ecosystem processes, objectives for ecosystem management should be set for the long term.

9. Management must recognise that change is inevitable.

10. The ecosystem approach should seek the appropriate balance between, and integration of, conservation and use of biological diversity.

11. The ecosystem should consider all forms of relevant information, including scientific, indigenous and local knowledge, innovations and practices.

12. The ecosystem approach should involve all relevant sectors of society and scientific disciplines.

Central to an understanding of the ecosystem approach is the recognition that humans are an integral component of most ecosystems. This principle is supported by the Millennium Assessment that further recognises "…the concept of an ecosystem provides a valuable framework for analysing and acting on the linkages between people and the environment."[7]

All 12 guiding principles are relevant to the conservation and sustainable use of migratory species and their habitats. However, principles 2, 3, 5, 7 and 8 appear to be particularly relevant. For example, decentralised management (principle 2) raises issues of adequate information, while considering the effects of decisions on adjacent and other ecosystems (principle 3) is one aspect of a migratory range approach. Furthermore, migratory species contribute to ecosystem structure and function (principle 5) (e.g., biomass, perturbance, pollination/seed dispersal), as well provisioning services (e.g., human and other food sources), regulating services (e.g., predation and pollination) and cultural services (e.g., spiritual, recreational, educational and symbolic). The contributions are multi-scale in nature. Principle 7 (adopting the ecosystem approach at appropriate spatial and temporal scales) appears supportive of a migratory range approach. Finally, principle 8 (setting ecosystem management objectives for the long term in recognition of varying temporal scales and lag effects) would support the notion that impacts of activities on migratory species may not be evident for many years to come.

All 12 principles implicitly recognise the need to take a precautionary approach to biodiversity conservation and sustainable use.

2.4 Recommendations for the Development of IA Guidance Sensitive to Biodiversity and Migratory Species

The general purpose of this paper is to provide recommendations to the CMS Scientific Council with the ultimate goal of providing the basis to develop, if necessary, CMS guidelines on IA and migratory

species. The Scientific Council may wish to consider the following recommendations that address biodiversity in general and migratory species more specifically.

2.4.1 Recommendation 1: Adopt the Ramsar approach: Review the Ramsar Guidelines, further adapt them to migratory species as appropriate and consider the desirability of expanding their scope

As mentioned in Section 1.0, the Ramsar Guidelines represent an adaptation of the CBD Guidelines to the specific case of wetlands. If the Ramsar Guidelines are examined through the "lens" of migratory species, a number of potential applications can be identified with respect to each stage of the EIA process. Because these Ramsar Guidelines embody the CBD Guidelines plus some added wetlands related provisions, they could therefore be adapted to the specific case of migratory species as described in Box 3, keeping in mind, however, that neither the CBD nor the Ramsar Guidelines as yet apply to all of the commonly recognised stages of IA.

Box 3: Potential Adaptation of the Ramsar Guidelines to Migratory Species

- **Purpose and approach (paragraph 5).** Within the context of migratory species, the appropriate spatial scale in which to consider biodiversity considerations and impact assessment may often be wider than the immediate site and ecosystem that are threatened, as the migratory range of species (such as migratory fish or birds) may involve a series of ecosystems (including disjunct ones) thereby requiring a broader perspective.

- **Screening criteria (paragraphs 13 and 14).** Projects that have possible implications for migratory species and/or their known habitat could constitute an example of a positive list and expert judgment IA screening mechanisms. In addressing the likelihood of effects and their relevance and significance for CMS–related values, reference could be made to Ramsar guidance on ecological character and on risk assessment.

- **Questions for screening (paragraphs 16 and 17).** The objectives of CMS should be considered in the same way as for CBD, i.e., promoting the conservation of migratory species habitat, promoting the sustainable or wise use of this habitat, and the implied objective of maintaining the ecological character of this habitat.

- **Scoping (paragraphs 18–20).** With respect to habitats frequented by migratory species, compilation of baseline data should relate to the site's carrying capacity for the species in question. Hence the baseline should be the target condition (carrying capacity) as described in any relevant management plan for the area. At the species diversity level, identification of seasonal, tidal and diurnal rhythms may be relevant with respect to a species' migratory and/or breeding habits. At the ecosystem level, identification of a species' adaptations to/dependency on seasonal rhythms and/or irregular events (such as drought, fire, wind etc) may be relevant.

- **Impact analysis and assessment (paragraphs 23–24).** In conducting project-level EIA for specific areas of migratory species habitat, reference should be made to Ramsar guidance on ecological character and on risk assessment.

- **Reporting-the Environmental Impact Statement (paragraph 26).** With respect to transboundary impacts, CMS Parties should give regard to Article 5 of the Ramsar Convention and the Guidelines for International Cooperation under the Ramsar Convention.

- **Review (paragraphs 27–28).** For guidance on public involvement, Ramsar's "*Guidelines for establishing and strengthening local communities' and indigenous people's participation in the management of wetlands*" should be of relevance.

2.4.2 Recommendation 2: Review the application of the CBD's ecosystem approach to migratory species and IA, taking into consideration the migratory range approach

The habitats of migratory species can be found within a wide range of ecosystems across a number of Range States. Maintaining the structure and function of these ecosystems is critical to the ultimate survival of migratory species and their habitats. The CMS/CBD Complementarities Study8 noted that solely focusing on habitat conservation might not produce the best results for migratory species if other threats and needs relating to the species go unaddressed, either within individual Range States or across a migratory range.

The Complementarities Study argued that a "migratory range approach" (which combines an appropriate combination of both ecosystem and species-related approaches across a migratory range) is the scale applicable to migratory species conservation and sustainable use measures. Such an approach would assist in reflecting the principle that threats in one Range State can negatively impact upon a migratory species throughout its entire range and maintaining the structure and function of these ecosystems is critical to the ultimate survival of migratory species and their habitats.

Since the ecosystem approach is the new paradigm for biodiversity conservation, and the CBD has affiliated it with IA, it follows that the CMS Scientific Council should review the ecosystem approach's applicability to migratory species, IA and the migratory range approach.

2.4.3 Recommendation 3: Adopt and apply World Bank recommendations

The World Bank's 1995 review of biodiversity in EIA arrived at a number of key recommendations for integrating biodiversity into EIA. These included:

1. *Select suitably qualified and experienced biodiversity specialists*, in terms of both technical and managerial capabilities, and then enable them to play an effective role in the EA process. Types of expertise required may include taxonomists, ecologists and bio-sociologists specializing in particular taxa of project-specific importance:

- Ornithologists (e.g., migratory birds);
- Mammologists (e.g., migratory mammals);
- Ichthyologists (e.g., migratory fish); and
- Herpetologists (e.g., migratory marine reptiles).

2. *Identify likely impacts on biodiversity and indicate their relative importance in all stages of EIA*, including the baseline inventory, impact assessment, mitigation, management and monitoring plans and translate the results into coherent terms of reference.

3. *Provide a meaningful context, including background information*, on biodiversity relevant to decision-making, as well as relevant maps.

4. *Determine the range and type of baseline data required* to make defensible and robust predictions of impacts on biodiversity, and select and apply robust methodologies for data collection and prediction formulation. This would include:

    - The current status of biodiversity and trends in biodiversity over time;
    - Providing for longer–term fieldwork to incorporate natural variability and seasonality elements (particularly relevant to migratory species); and
    - Extending the focus beyond the current bias towards forests habitats, protected and pristine areas, to ensure due weight is also given to other habitats (including wetlands, tundra, grasslands, desert) and also to unprotected areas.

5. *Predict impacts* on biodiversity and evaluate their significance.

6. *Strengthen baseline information* through promotion of long–term initiatives, expertise and experience.

7. *Enhance awareness and levels of public involvement in EIA* (and by extension, in the treatment of biodiversity in EIA). This would also involve promoting biodiversity concerns within strategic (sectoral and regional) EIAs.

8. Design an appropriate *Environmental Management Plan* (EMP) that prevents, minimizes, mitigates against, compensates for or offsets adverse impacts on biodiversity (in that order of preference), takes advantage of opportunities to enhance or restore biodiversity and takes account of the capacities of proposed implementing agencies.

9. Provide effective *post–implementation monitoring and evaluation*.

10. *Present biodiversity information obtained at relevant decision-making stages*, including the presentation of appropriate contextual information such as maps, aerial photographs and other remotely sensed data.

11. *Promote greater awareness and public involvement* in the treatment of biodiversity in EIA.

12. Build *EIA capacity in developing countries*.

2.4.4 Recommendation 4: Integrate general biodiversity considerations into IA procedures

Biodiversity considerations should be integrated into each of the commonly recognised stages of IA.[9] Box 2 provides a summary of suggestions.

Box 2: Checklist of Biodiversity Considerations for the Commonly Recognised Stages of IA

Screening

- Categories include activities likely to impact biological diversity such as projects that affect a protected area or projects that would result in the introduction of alien species.
- Thresholds apply biodiversity measures, especially those relevant to over-exploitation of plant and animal species.
- Preliminary assessment.
- Impact lists include impacts on ecosystems, habitats, species and communities important to biodiversity.

Scoping

- Temporal and spatial parameters reflect biodiversity considerations.
- Cumulative impacts on biodiversity are taken into account.
- Public participation is used to minimize bias in defining impacts. Impact lists include impacts on ecosystems, habitats, species and communities important to biodiversity.
- Baseline biodiversity information is obtained from information provided from a variety of sources such as the CBD's clearinghouse mechanism, the CMS Information Management System and databases such as the Global Register of Migratory Species.
- Existing baseline data is supplemented with further studies as necessary.
- Data produced through studies and predictions is available to the CBD CHM and the CMS Information Management System thereby furthering exchange of information.

Identification of impacts

- Methodologies include direct and indirect impacts on biodiversity such as habitat loss and fragmentation, introduced species, pollution of soil, water and atmosphere and global climate change.
- Indicator species are used as a criterion.

Examination of alternatives

- Alternatives are assessed for their potential impacts on biodiversity and for the distribution of their costs and benefits.

Evaluation of significance

- Stakeholders are involved in the process of attaching significance to impacts thereby furthering the equitable sharing objective of CBD.

2.4.5 Recommendation 5: Enhance availability of biodiversity information

The availability of biodiversity information is important to the quality of IA studies. Improving knowledge and information about various species and ensuring this information is readily available to EIA practitioners is one step CMS and its Contracting Parties can take in order to improve the quality of EIA and the integration of migratory species considerations.

2.4.6 Recommendation 6: Conduct appropriate biodiversity impact assessment procedures

In 1997, IUCN proposed a new IA tool – Biodiversity Impact Assessment (BIA) – as an extension of EIA to ensure that biodiversity issues were explicitly considered in IA.10 EIA practitioners should be encouraged to use established and credible, including rapid, biodiversity assessment techniques such as BIA. At present, such criteria, especially at the ecosystem level, are under-developed and require serious attention when attempting to develop in-country mechanisms to incorporate migratory species within EIA.

2.4.7 Recommendation 7: Integrate biodiversity within relevant environmental legislation

Growing recognition of the poor integration of biodiversity within IA in the last ten or so years has prompted many countries to revise existing legislation and provide additional guidance in light of the potential impacts of proposed projects on their biological resources.11 Countries are increasingly incorporating the concept of biodiversity in their definition of the term "environment", which includes resources such as land, water, air, organic and inorganic matters, items of indigenous and cultural heritage, as well as the living organisms that constitute components of biological diversity.

2.4.8 Recommendation 8: Develop and utilise appropriate biodiversity indicators

Within the CBD, the issue of biodiversity indicators has been discussed at least since 1997. In February 2004, the CBD COP in Decision VII/8:

1. Welcomed the ongoing efforts to develop biodiversity indicators within the various CBD thematic programmes and crosscutting themes;

2. Recognized that regional and national differences, and different national priorities concerning biodiversity conservation and sustainable use, necessitate a flexible approach at the national level, but that there are benefits in promoting a more consistent framework for data gathering,

computation and reporting that can contribute to the development of commonly agreed indicators at regional and global levels; and

3. Urged all CBD Parties that had not already done so to develop a set of biodiversity indicators as part of their national strategies and action plans, taking into account, as appropriate, the targets of the Global Strategy for Plant Conservation and the target to achieve by 2010 a significant reduction in the current rate of biodiversity loss at global, regional and national levels.

Work in this field is ongoing. The next revision of the CBD/CMS Joint Work Programme (2002–2005) could identify possible future work between the CBD and CMS in this area. The CMS Scientific Council may was to consider further developing the concept of using migratory species as indicators at global, regional and national levels. This work could contribute to CMS's achievement of the 2010 target.

Section 3: Applying the IA Process to Migratory Species

3. 1 Linking migratory species and IA: Identifying critical habitats for migratory species

Typically, migration follows an annual cycle and is regulated by the seasonal succession. In certain species however migration follows multi-annual patterns and can be prompted by factors other than the regular seasonal cycle. The *annual cycle* and *seasonal requirements* of a migratory wild animal are fundamental aspects of its biology and ecology and, therefore, greatly relevant to conducting an IA.

The most assiduous efforts to conserve a migratory species in its breeding range will be to no avail unless it is also conserved in its non–breeding range. Where these ranges are separated by thousands of kilometres, the stopover points en route from one range to the other also become crucially important. An appreciation of the seasonal requirements of migratory species can assist not only in the establishment of protected areas (to cater for different seasonal requirements), but also in modifying the seasonal protocol to manage such habitats and activities like block burning and hunting. Appreciating a migrant's seasonal requirements (in terms of both location and timings) will in all likelihood also yield collateral information on the species' likely or potential threats and potentially how to manage them. From an IA perspective, this sort of information is also essential to understand the potential complete range of threats facing different classes of migrants.

Migratory species of wild animals spend different periods of their annual cycle in widely separated and ecologically disparate locations. It is now clear that these periods are inextricably linked and that the biological phenomena observed are the result of a complex set of interactions occurring over this space and time continuum.

To include biodiversity and migratory species considerations in the conduct of an EIA it is necessary to understand how events in different stages of the animal's annual cycle interact and influence subsequent events at the level of both the individual and the population. The following habitats can typically refer to stages in a migrant’s life:

(1) Breeding grounds;

(2) Staging/resting areas;

(3) Migratory routes (flyways for birds); and

(3) Wintering quarters.

If migratory species are to be conserved and sustainably used successfully, it will be necessary to guarantee adequate living conditions in each of their habitats identified above. Understanding the factors operating on migratory species *throughout the annual cycle* is crucial to the production of robust IA models that can predict ecological responses to changes in habitat quantity and quality at diverse locations and throughout the year. Incorporating individual and population–level effects that might interact between seasons will produce IAs that contain more robust models of population dynamics and will provide vital information on where and when population limitation occurs.

An important, but unresolved issue in the study of migratory animals (particularly birds) is the extent to which individuals from the same breeding area migrate to the same *non*-breeding area and vice versa. Such links between breeding and non-breeding areas are referred to as "migratory connectivity".[12] It is generally, if somewhat implicitly, recognised that migratory connectivity has important consequences for impact assessment and migratory species.[13] There are several practical reasons for determining the links between populations of migratory organisms. Understanding the

factors that govern population size is critical when conducting an EIA and, for migratory animals, this requires a complete understanding of both:

1. Year–round geographical ranges; and

2. Specific habitat requirements.

Some migratory species might be vulnerable if large portions of a breeding population migrate to a restricted wintering location or vice versa (for example, as seen in many species of migratory insects, fish, reptiles and pelagic birds).[14] Similarly, for example declines in breeding populations of Neotropical migratory birds have been linked to their winter habitat preferences – a pattern that is consistent with changes in forest cover in the tropics.[15] Without a firm understanding of the year–round geographical ranges or habitat requirements of migratory animals, it becomes difficult to develop long–term conservation strategies or conduct effective EIA programmes.

3.2 Identifying principal threats to different classes of migratory animals

EIA that purports to address any animal (resident or migratory) must first identify the presence of migratory species in the project or activity area. Second it must identify and analyse all relevant potential threats that the particular project or activity may pose, including those to migratory species.

A number of threats impact (either directly or indirectly) *all* classes of migratory species. These threats can manifest as naturally occurring phenomena or can be man–made. An indicative list includes:

- Introduction of alien (invasive) species;
- Habitat destruction and fragmentation;
- Introduction of agricultural and industrial pollutants; and
- Climate change and desertification.

For the purposes of conducting EIA, the majority of CMS–listed migratory animals can be classified according to the following categories:

1. Birds;

2. Marine mammals, fish and reptiles;

3. Freshwater fish; and

4. Terrestrial mammals.

Different types of threats tend to operate for each category, though some are common to 2 or more. Appendix 3 provides an indicative list of those threats typically associated with each of the above classes. Impact assessment with respect to migratory birds is highlighted in section 3.3.

3.3 IA with respect to migratory birds

The literature[16] reveals that for bird migrants at their *staging grounds* and *wintering quarters*, four general factors can be identified as having a detrimental influence on migratory bird populations:

1. A general **restriction and destruction of habitat**, including the loss of specific sites as well as of food sources;

2. **Human disturbances** (i.e., the growth of tourism around coastal and inland waters);

3. Direct and indirect (e.g., via reductions in food supplies) **effects of biocides** (e.g., via reductions in food supplies) employed in agriculture and forestry and in the control of parasites dangerous to man, and the damaging effects of industrial wastes; and

4. Direct persecution by man through **hunting and trapping** (of limited relevance to migratory species enjoying protection by virtue of their CMS-listed status).

During *bird migration*, **collisions with overhead cables and wind farms/turbines** (together with electrocution) constitute an emerging and relatively recent threat. According to the few satisfactory studies available to date, the majority of diurnal migrants avoid wind farms in time, and nocturnal migrants presumably fly over them at greater heights. However, systematic studies on this topic are urgently required. BirdLife International recently (December 2003) provided advice on this issue to the Bern Convention on Nature Conservation and draft guidelines have been prepared.

3.3.1 Linking the characteristics of migratory birds to the EIA process

The factors that can lead to the decline of a migratory species can influence practically all stages of a bird migrant's life cycle. Perhaps more than any other group of migratory animal, birds demonstrate how important it is for IA to adequately recognise the temporal and spatial scope of a migrant's life cycle. Each of the four migratory stages generally associated with migratory bird species are discussed in further detail below.

3.3.1.1 IA and migratory bird breeding grounds

Habitat destruction and fragmentation constitute arguably the greatest threats to the ongoing viability of migrant bird breeding areas. Rigorous sampling of such breeding areas as part of the screening/scoping stages of the EIA process is required if accurate data is subsequently to be obtained. In relation to migrants occupying forested areas several migratory bird studies have demonstrated that for example forest–interior birds have low reproductive success in small forest fragments because of high rates of predation on eggs and nestlings and high rates of parasitism. These species could also be undergoing a more general decline as a result of the loss of winter habitat.

3.3.1.2 IA and migratory bird staging/resting areas

Migratory bird species often suffer severe disturbances at their staging grounds (and wintering quarters) especially in centres of tourism, as well as in regions of intensive hunting. Due to the relatively short time frames in which such areas are occupied, the extent of damage to a migrant's staging/resting area arising from such anthropogenic forms of disturbance is difficult to assess.

3.3.1.3 IA and seasonal/transboundary migratory bird movements

In certain areas, the unplanned spread of wind farms constitutes arguably the greatest threat to the success of migratory bird transboundary movements. Recent work has focussed on the impacts of wind farms on the flyway paths of several species of migratory birds.

3.3.1.4 IA and migratory bird wintering areas

Understanding habitat requirements during the breeding season will be of little use in revealing why a population has declined if the major cause of the decline is high winter mortality. Accordingly,

migratory species wintering habitats should also be the focus of attention during the screening/scoping stages of IA.

If a species of migratory bird were declining because of widespread destruction of winter habitat, the decline would probably not be concentrated in a few areas of its breeding range, but would be detected throughout its breeding range. Despite the abundance of firm evidence for such long–term population declines in Neotropical migrants, there is good reason to be concerned about their future because of threats to both their winter and breeding habitats.[1718]

Section 4: Conclusions and Recommendations for the CMS Scientific Council

The research contributing to this paper has reviewed international IA guidance as it might apply to migratory species. Various international instruments exist that, to a greater or lesser extent, address the issue of IA. Each of the biodiversity–related conventions acknowledges the importance of integrating generally accepted EIA and SEA principles (such as biodiversity conservation and sustainable use objectives) into relevant sectoral planning and policy processes. This need emerges from recognition that biodiversity loss at both species and ecosystem levels is largely caused by activities undertaken in specific economic sectors such as industry, tourism, fisheries, forestry and mining.

Section 1 noted that both the CBD and Ramsar Convention have adopted EIA guidelines. The CBD Guidelines were designed to fill some perceived gaps in impact assessment with respect to biodiversity. The CBD Guidelines focus solely on the screening and scoping stages of the IA process and, though they are entirely relevant to the objectives of CMS, they do not apply to the entire IA process. In other words, their scope is limited.

Ramsar's subsequent adaptation and adoption of the CBD Guidelines provides further guidance that is relevant to migratory species. Furthermore, both the CBD and Ramsar Convention recognize the role of SEA as an important tool for undertaking a review and redesign of policies, plans and programmes in order to integrate the conservation and sustainable use of biodiversity and wetlands.

The risk in trying to adopt and then codify a set of principles addressing migratory species within IA processes that will work in any country of the world is that they will be so basic and general as not to make much of a difference or, at the very least, lack requisite specificity. Consequently, it is reasonable to assume that a majority of migratory species interests would be well served by building on pre-existing work and further adapting the Ramsar Guidelines to migratory species. The question of how best they might be served, together with what specific migratory species issues may need special attention, remains an outstanding issue for review by the CMS Scientific Council.

Section 2 proposed a number of *general mechanisms* to more adequately address biodiversity at <u>each</u> stage of the IA process.

The CBD's ecosystem approach appears to be valid framework within which to consider impact assessment and migratory species keeping in mind the need to take a migratory range approach. However, a closer review of the relationship between the ecosystem approach and a migratory range approach is needed, especially in the context of IA.

Section 3 noted that the annual cycle and seasonal requirements of a migratory wild animal are fundamental aspects of its biology and ecology and therefore highly relevant to the conduct of IA. Understanding the factors operating on a migratory species throughout its annual or multi-annual cycle is crucial to the production of robust IA models capable of predicting ecological responses to changes in habitat quantity and quality at diverse locations and throughout the year.

Section 3 argues that for the purposes of conducting IA, the vast majority of CMS–listed migratory animals can be classified according to whether the animal(s) falls into one of four categories.

The paper suggests that a number of different and readily recognisable classes of threats/impacts can be identified for each category. These could be useful in pre-screening the possible impacts of a project or activity on migratory species (after identifying as a threshold issue that migratory species are indeed present and threatened). Analysis of each of these threats/impacts with respect to relevant classes of migratory animal is presented in Appendix 3.

Section 3 further noted that it is important to bear in mind that any EIA procedure that purports to address migratory species once they are identified as being present in the proposed project or activity area should, at the very least, include an analysis of the species' breeding grounds, staging/resting areas, migratory routes and wintering quarters. This will assist in ensuring that individual and population–level effects that may interact between seasons produce IAs containing rigorous models of population dynamics which provide vital information on where and when population limitations (in response to perceived threats or impacts) occur.

Based on the recommendations made especially in Section 2 of this paper, in its follow-up of CMS Resolution 7.2, it is recommended that the Scientific Council:

1. Adopt the Ramsar approach, review the Ramsar Guidelines, further adapt them to migratory species, as appropriate, and consider the desirability of expanding their scope.

2. Review the application of the CBD's Ecosystem Approach to migratory species and IA, taking into consideration the migratory range approach.

3. Integrate the World Bank recommendations into any guidance developed, especially the need for awareness raising and capacity-building.

Furthermore, the Scientific Council should consider the following in order to enhance the quality and conduct of IA with regard to migratory species considerations:

1. The integration of general biodiversity considerations into IA procedures;

2. The availability of biodiversity information;

3. The conduct of appropriate biodiversity impact assessment procedures;

4. The integration of biodiversity within relevant environmental legislation and the integration of definitions of biodiversity into relevant impact assessment legislation; and

5. The development and utilisation of appropriate biodiversity indicators.

Finally, the Scientific Council may wish to consider the process by which the recommendations made in this study should be reviewed, keeping in mind the need to make an appropriate input into CMS COP8 in mid to late 2005. If an intersessional working group is deemed desirable the Scientific Council should elaborate succinctly its terms of reference, taking into consideration how it should achieve its work, including the need for meetings, and the related financial implications.

Appendices

Appendix 1: CBD Guidelines

Appendix 2: Ramsar Guidelines

Appendix 3: Table of Activities/threats Potentially Affecting Classes of Migratory Species

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[1] Roe, D., Dalal-Clayton, B., and Hughes. R. (1995). A Directory of Impact Assessment Guidelines. International Institute for Environment and Development. London.

[2] Therivel, R. and Thompson, S. 1996. Strategic Environmental Assessment and Nature Conservation. Report to English Nature. Peterborough, UK.

[3] Examples include: the European Union (EIA Directive 85/337/EEC as amended 97/11/EC by the Proposal for an SEA Directive (COM 96/511 and COM 99/73)); New Zealand (e.g., Resource Management Act 1991 and Hazardous Substances and New Organisms Act 1991) and in Canada (the Canadian 1999 Cabinet Directive on Environmental Assessment, Policy, Plan and Program Proposals).

[4] For example, the results of workshops organised by GTZ and reported in UNEP/CBD/COP/5/INF/34; Anneveldt, E. and Pasman, M., 2001. Biodiversity in EIA Guidelines. A study on the extent to which biodiversity is currently being addressed in the EIA Guidelines of the South – Asian countries. Regional Environmental Assessment Program, IUCN Asia, Kathmandu, Nepal; Treweek, J. and Zanewich D., 2001. Integrating Biodiversity into National Environmental Assessment Processes: A Summary of Country Reports and Case Studies. Komex Europe Ltd, Bristol, UK; Bagri, A., McNeely J., and Vorhies F., 1998. Biodiversity and Impact Assessment. Paper presented at a workshop on biodiversity and impact assessment at IAIA 1998 Conference on Sustainability and the Role of Impact Assessment in the Global Economy. 18th Annual Meeting of IAIA, Christchurch, New Zealand. 21 – 22 April 1998; Le Maitre, D. C,, and Gelderblom, C.M.,1998. Biodiversity Impact Assessment: Putting Theory into Practice. Paper presented at a workshop on biodiversity impact assessment at IAIA 1998 Conference on Sustainability and the Role of Impact Assessment in the Global Economy. 18th Annual Meeting of IAIA, Christchurch, New Zealand. April 1998.

[5] Treweek and Zanewich, 2001.

[6] For these reasons, guidelines and texts produced under the CBD and Ramsar Conventions in recent years have stressed the importance of strategic environmental assessment.

[7] Millennium Assessment Secretariat (2003). People and Ecosystems: A Framework for Assessment. ICLARM Office, Penang, Malaysia.

[8] UNEP/CBD/COP/5/INF/28.

[9] Bagri *et al.*, 1998.

[10] Bagri, A; McNeely J., and Vorhies, F., 1997. Biodiversity and Impact Assessment. Paper presented to the 7th COP to the Ramsar Convention. Gland, Switzerland.

Bagri, A; McNeely J., and Vorhies, F., 1998. Biodiversity and Impact Assessment. Paper presented at a workshop on biodiversity and impact assessment at IAIA 1998 Conference on Sustainability and the Role of Impact Assessment in the Global Economy. 18th Annual Meeting of IAIA, Christchurch, New Zealand.

[11] The introduction of legislation that specifically addresses biodiversity considerations as part of the overall IA process, such as Australia's Threatened Species Conservation Act (1995) is an example.

[12] Webster, M., Marra, P., Haig, S., Bensch, S., and Holmes, R. (2002). Links Between Worlds: Unravelling Migratory Connectivity, in Trends In Ecology and Evolution. Vol 17, No 2. February 2002.

[13] Ibid

[14] Ibid

[15] A more specific example is the endangered Kirtland's warbler, the largely unknown winter habitat requirements for which are probably crucial to the long term population viability of the species.

[16] Berthold, P. (2002). Bird Migration – A General Survey (2nd Edition) Oxford University Press.

[17] Ibid.

[18] Wintering areas are of great importance in the annual cycle of manatees. In their study of manatees off the coast of Florida in the United States, Deutsch et al. (2003) found that an apparently greater lability of manatees in over-wintering areas, combined with the dynamic nature of the species' winter movements, suggested that manatees may more readily discover and occupy a newly established protected area (within their annual range) in winter than during the warm season. The study found that winter use of industrial heated effluents by manatees throughout much of their range attests to the species' ability to adapt to and exploit human – altered environments. The study noted that the potential for increased stress on communities of aquatic vegetation arising from higher local densities of manatees is probably greatest during winter, when manatee distribution is restricted by cold temperatures and plant growth and nutritional value are low. EIAs addressing manatees should aim to specifically address this issue. Deutsch, C.J., J.P. Reid, R.K. Bonde, D.E. Easton, H.I. Kochman, and T.J. O'Shea. 2003. Seasonal movements, migratory behavior, and site fidelity of West Indian manatees along the Atlantic Coast of the United States. Wildlife Monographs 67:1–77.

VI/7. Identification, monitoring, indicators and assessments

A. Further development of guidelines for incorporating biodiversity-related issues into environmental-impact-assessment legislation or processes and in strategic impact assessment

The Conference of the Parties

1. *Endorses* the draft guidelines for incorporating biodiversity-related issues into environmental impact assessment legislation and/or processes and in strategic environmental assessment contained in the annex to the present decision;

2. *Urges* Parties, other Governments and organizations to apply the guidelines as appropriate in the context of their implementation of paragraph 1 of Article 14 of the Convention and share their experience, *inter alia*, through the clearing-house mechanism and national reporting;

3. *Requests* the Executive Secretary to compile and disseminate, through the clearing-house mechanism and other means of communication, current experiences in environmental impact assessment and strategic environmental assessment procedures that incorporate biodiversity-related issues, as well as experiences of Parties in applying the guidelines; in light of this information, to prepare, in collaboration with relevant organizations, in particular the International Association for Impact Assessment, proposals for further development and refinement of the guidelines, particularly to incorporate all stages of the environmental impact assessment and strategic environmental assessment processes taking into account the ecosystem approach (particularly principles 4, 7 and 8) and to provide a report of this work to the Subsidiary Body prior to the seventh meeting of the Conference of the Parties.

Annex

GUIDELINES FOR INCORPORATING BIODIVERSITY-RELATED ISSUES INTO ENVIRONMENTAL IMPACT ASSESSMENT LEGISLATION AND/OR PROCESS AND IN STRATEGIC ENVIRONMENTAL ASSESSMENT

1. For the purpose of these guidelines, the following definitions are used for environmental impact assessment and strategic environmental assessment:

(a) *Environmental impact assessment* is a process of evaluating the likely environmental impacts of a proposed project or development, taking into account inter-related socio-economic, cultural and human-health impacts, both beneficial and adverse. Although legislation and practice vary around the world, the fundamental components of an environmental impact assessment would necessarily involve the following stages:

(i) Screening to determine which projects or developments require a full or partial impact assessment study;

(ii) Scoping to identify which potential impacts are relevant to assess, and to derive terms of reference for the impact assessment;

(iii) Impact assessment to predict and identify the likely environmental impacts of a proposed project or development taking into account inter-related consequences of the project proposal, and the socio-economic impacts;

(iv) Identifying mitigation measures (including not proceeding with the development, finding alternative designs or sites which avoid the impacts, incorporating safeguards in the design of the project, or providing compensation for adverse impacts);

(v) Deciding whether to approve the project or not; and

(vi) Monitoring and evaluating the development activities, predicted impacts and proposed mitigation measures to ensure that unpredicted impacts or failed mitigation measures are identified and addressed in a timely fashion;

(b) *Strategic environmental assessment* is the formalized, systematic and comprehensive process of identifying and evaluating the environmental consequences of proposed policies, plans or programmes to ensure that they are fully included and appropriately addressed at the earliest possible stage of decision-making on a par with economic and social considerations. 1/ Strategic environmental assessment, by its nature, covers a wider range of activities or a wider area and often over a longer time span than the environmental impact assessment of projects. Strategic environmental assessment might be applied to an entire sector (such as a national policy on energy for example) or to a geographical area, (for example, in the context of a regional development scheme). The basic steps of strategic environmental assessment are similar to the steps in environmental impact assessment procedures, 2/ but the scope differs. Strategic environmental assessment does not replace or reduce the need for project-level environmental impact assessment, but it can help to streamline the incorporation of environmental concerns (including biodiversity) into the decision-making process, often making project-level environmental impact assessment a more effective process.

1. Purpose and approach

2. The objective of these draft guidelines is to provide general advice on incorporation of biodiversity considerations into new or existing environmental impact assessment procedures, noting that existing procedures take biodiversity into consideration in different ways. A draft framework has been developed to address the screening and scoping phases of environmental impact assessment. Further development of the framework will be required to address the incorporation of biodiversity into subsequent stages of the environmental impact assessment process, including impact assessment, mitigation, evaluation and monitoring, and into strategic environmental assessment.

3. Individual countries may redefine the steps in the procedure to their needs and requirements as befits their institutional and legal setting. The environmental impact assessment process, in order to be effective, should be fully incorporated into existing legal planning processes and not be seen as an "add-on" process.

4. As a prerequisite, the definition of the term "environment" in national legislation and procedures should fully incorporate the concept of biological diversity as defined by the Convention on Biological Diversity, such that plants, animals and micro-organisms are considered at the genetic, species/community and ecosystem/habitat levels, and also in terms of ecosystem structure and function.

5. With regard to biodiversity considerations, the ecosystem approach, as described in decision V/6 of the Conference of the Parties and taking into account any further elaboration of the concept within the framework of the Convention, is an appropriate framework for the assessment of planned action and policies. In accordance with the approach, the proper temporal and spatial scales of the problems should be determined as well as the functions of biodiversity and their tangible and intangible values for humans that could be affected by the proposed project or policy, the type of adaptive mitigation measures and the need for the participation of stakeholders in decision-making.

6. Environmental impact assessment procedures should refer to other relevant national, regional and international legislation, regulations, guidelines and other policy documents such as the national biodiversity strategy and action plan documents, the Convention on Biological Diversity and biodiversity-related conventions and agreements including, in particular, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the Convention on the Conservation of Migratory Species of Wild Animals and the related agreements, the Convention on Wetlands (Ramsar, Iran, 1971), the Convention on Environmental Impact Assessment in a Transboundary Context; the United Nations Convention on the Law of

1/ Based on Sadler and Verheem, 1996.

2/ Saddler and Verheem, 1996; South Africa, 2000; Nierynck, 1997 ; Nooteboom, 1999.

the Sea; the European Union directives on environmental impact assessment, and the Protocol for the Protection of the Mediterranean Sea against Pollution from Land-based Sources.

7. Consideration should be given to improving integration of national biodiversity strategy and action plans and national development strategies using strategic environmental assessment as a tool for such integration to promote the establishment of clear conservation targets through the national biodiversity strategy and action plan process and the use of those targets for the screening and scoping targets of environmental impact assessment and for developing mitigation measures.

2. Biodiversity issues at different stages of environmental impact assessment

(a) Screening

8. Screening is used to determine which proposals should be subject to impact assessment, to exclude those unlikely to have harmful environmental impacts and to indicate the level of environmental appraisal required. If screening criteria do not include biodiversity measures, there is a risk that proposals with potentially significant impacts on biodiversity will be screened out.

9. Since a legal requirement for environmental impact assessment on environmental grounds does not guarantee that biological diversity will be taken into account, consideration should be given to incorporating biodiversity criteria into existing or new screening criteria.

10. Types of existing screening mechanisms include:

(a) Positive lists identifying projects requiring environmental impact assessment. A few countries use (or have used) negative lists, identifying those projects not subject to environmental impact assessment. These lists should be reassessed to evaluate their inclusion of biodiversity aspects;

(b) Expert judgement (with or without a limited study, sometimes referred to as "initial environmental examination" or "preliminary environmental assessment"); and

(c) A combination of a positive list and expert judgement; for a number of activities an environmental impact assessment is more appropriate, for others an expert judgement may be desirable to determine the need for an environmental impact assessment.

11. The result of screening can be that:

(a) An environmental impact assessment is required;

(b) (i) A limited environmental study is sufficient because only limited environmental impacts are expected; the screening decision is based on a set of criteria with quantitative norms or threshold values;

(ii) There is still uncertainty whether an environmental impact assessment is required and an initial environmental examination has to be conducted to determine whether a project requires environmental impact assessment or not, and

(c) The project does not require an environmental impact assessment.

12. How to use these guidelines for screening:

(a) Countries with a positive list identifying projects requiring environmental impact assessment should use, as appropriate, appendices I and II below for guidance on reconsidering their existing positive list with respect to biological diversity considerations. By assessing the possible impacts of categories of activities on biological diversity the existing list can be adjusted, if required;

(b) In countries where screening is based on expert judgement, experience has shown that professionals make screening decisions, often using "mini environmental impact assessment" to come to this decision. These guidelines, its appendices and other guidelines help provide these professionals with the means to come to a motivated, transparent and consistent screening decision. Furthermore, the expert teams should include professionals with biodiversity expertise;

(c) In countries where screening is based on a combination of a positive list and expert judgement, country-specific thematic or sector guidelines, often including quantitative norms or thresholds, facilitate the responsible people to make a well-founded and defendable decision. For biodiversity, thematic guidelines could be developed, 3/ sector guidelines need to be reviewed on biodiversity considerations.

The screening criteria

13. Screening criteria may relate to: (i) categories of activities, including thresholds referring to magnitude of the activity and/or size of the intervention area, duration and frequency or to (ii) a magnitude of biophysical change that is caused by the activity, or to (iii) maps indicating areas important for biodiversity with special legal status or of high biodiversity value and endemism, species patterns, breeding sites, or areas with species of high genetic value.

14. Determining norms or threshold values is partly a technical and partly a political process of which the outcome may vary for countries and for ecosystems. The technical process should at least provide a description of:

(a) Categories of activities that may affect biological diversity and the direct and indirect biophysical changes likely to result from these activities, taking into account characteristics such as: type or nature of activity, magnitude, extent/location, timing, duration, reversibility/irreversibility, likelihood, and significance; possibility of interaction with other activities or impacts;

(b) Area of influence. Knowing the biophysical changes that result from an activity, the expected area of influence of these changes can be modelled or predicted, including the probability of off-site effects;

(c) Biodiversity maps indicating ecosystems and/or land-use types and their use and non-use values (showing the use and non-use values of biodiversity).

15. The process of developing a national biodiversity strategy and action plan can generate valuable information such as conservation priorities and targets which can guide further development of environmental impact assessment screening criteria. 4/ Appendix 2 below presents a generic list of criteria, intended to be a practical reference for further in-country development of criteria.

Pertinent questions for screening

16. Considering the objectives of the Convention on Biological Diversity, i.e., in particular, conservation, sustainable use and equitable sharing of benefits derived from biological diversity, fundamental questions need to be answered in an environment impact assessment study:

(a) Does the intended activity affect the physical environment in such a manner or cause such biological losses that it influences the chance of extinction of cultivars, varieties, populations of species, or the chance of loss of habitats or ecosystems?

3/ Some concrete targets in the draft global strategy for plant conservation (see item 17.3 below).

4/ Summarized in the IAIA information document by Treweek, 2001, box 2.

(b) Does the intended activity surpass the maximal sustainable yield, the carrying capacity of a habitat/ecosystem or the maximum and minimum 5/ allowable disturbance level of a resource, population, or ecosystem?

(c) Does the intended activity result in changes to the access to and rights over biological resources?

17. To facilitate the development of criteria, the questions above have been reformulated for the three levels of diversity, reproduced in appendix 1 below.

(b) Scoping

18. Scoping narrows the focus of the broad issues found to be significant during the screening stage. It is used to derive terms of reference (sometimes referred to as guidelines) for environmental impact assessment. Scoping also enables the competent authority (or environmental impact assessment professionals in countries where scoping is voluntary):

(a) To guide study teams on significant issues and alternatives to be assessed, clarify how they should be examined (methods of prediction and analysis, depth of analysis), and according to which guidelines and criteria;

(b) To provide an opportunity for stakeholders to have their interests taken into account in the environmental impact assessment;

(c) To ensure that the resulting environmental impact statement is useful to the decision maker and is understandable to the public.

19. During the scoping phase, promising alternatives can be identified for in-depth consideration during the environmental impact assessment study.

20. The following sequence provides an example of iterative mechanism for scoping, impact assessment and consideration of mitigation measures, which should be carried out with the help of existing information and the available knowledge among stakeholders:

(a) Describe the type of project, its nature, magnitude, location, timing, duration and frequency;

(b) Describe the expected biophysical changes in soil, water, air, flora and fauna;

(c) Describe biophysical changes that result from social change processes as a result of the proposed project;

(d) Determine the spatial and temporal scale of influence of each biophysical change;

(e) Describe ecosystems and land-use types potentially influenced by the biophysical changes identified;

(f) Determine for each ecosystem or land-use type if the biophysical changes affect one of the following components of biological diversity: the composition (what is there), the temporal/spatial structure (how are biodiversity components organized in time and space), or key processes (how is biodiversity created and/or maintained);

(g) Identify in consultation with stakeholders the current and potential use-functions, non-use functions and other longer-term less tangible benefits of biological diversity provided by the ecosystems or

5/ For example, fire can be too frequent and too infrequent to sustain the integrity/health of a given ecosystem.

land-use types and determine the values these functions represent for society (see appendix 3 for an indicative list of functions);

(h) Determine which of these functions will be significantly affected by the proposed project, taking into account mitigation measures;

(i) For each alternative, define mitigation and/or compensation measures to avoid, minimize or compensate the expected impacts;

(j) With the help of the biodiversity checklist on scoping (see appendix 4 below), determine which issues will provide information relevant to decision making and can realistically be studied;

(k) Provide information on the severity of impacts, i.e. apply weights to the expected impacts for the alternatives considered. Weigh expected impacts to a reference situation (baseline), which may be the existing situation, a historical situation, or an external reference situation;

(l) Identify necessary surveys to gather comprehensive information about the biological diversity in the affected area where appropriate.

21. The expected impacts of the proposed activity, including identified alternatives, should be compared with the selected reference situation and with the autonomous development (what will happen with biodiversity over time if the project is not implemented). There should be awareness that doing nothing may in some cases also have significant effects on biological diversity, sometimes even worse than the impacts of the proposed activity (e.g. projects counteracting degradation processes).

22. At present, evaluation criteria for biological diversity, especially at ecosystem level, are under-developed and need serious attention when developing in-country mechanisms to incorporate biodiversity in environmental impact assessment.

(c) Impact analysis and assessment

23. Environmental impact assessment should be an iterative process of assessing impacts, redesigning alternatives and comparison. The main tasks of impact analysis and assessment are:

(a) Refinement of the understanding of the nature of the potential impacts identified during screening and scoping and described in the terms of reference. This includes the identification of indirect and cumulative impacts, and of the likely causes of the impacts (impact analysis and assessment). Identification and description of relevant criteria for decision-making can be an essential element of this period;

(b) Review and redesign of alternatives; consideration of mitigation measures; planning of impact management; evaluation of impacts; and comparison of the alternatives; and

(c) Reporting of study results in a environmental impact statement.

24. Assessing impacts usually involves a detailed analysis of their nature, magnitude, extent and effect, and a judgement of their significance, i.e., whether the impacts are acceptable to stakeholders, require mitigation, or are just unacceptable. Biodiversity information available is usually limited and descriptive and cannot be used as a basis for numerical predictions. There is a need to develop or compile biodiversity criteria for impact evaluation and to have measurable standards or objectives against which the significance of individual impacts can be evaluated. The priorities and targets set in the national biodiversity action plan and strategy process can provide guidance for developing these criteria. Tools will need to be developed to deal with uncertainty, including criteria on using risk assessment techniques, precautionary approach and adaptive management.

(d) Consideration of mitigation measures

25. If the evaluation process concludes that the impacts are significant, the next stage in the process is to propose mitigation ideally drawn together into an "environmental management plan". The purpose of mitigation in environmental impact assessment is to look for better ways to implement project activities so that negative impacts of the activities are avoided or reduced to acceptable levels and the environmental benefits are enhanced, and to make sure that the public or individuals do not bear costs which are greater than the benefits which accrue to them. Remedial action can take several forms, i.e. avoidance (or prevention), mitigation (including restoration and rehabilitation of sites), and compensation (often associated with residual impacts after prevention and mitigation).

(e) Reporting: the environmental impact statement (EIS)

26. The environmental impact statement is designed to assist: (i) the proponent to plan, design and implement the proposal in a way that eliminates or minimizes the negative effect on the biophysical and socio-economic environments and maximizes the benefits to all parties in the most cost effective manner; (ii) the Government or responsible authority to decide whether a proposal should be approved and the terms and conditions that should be applied; and (iii) the public to understand the proposal and its impacts on the community and environment and provide an opportunity for comments on the proposed action for consideration by decision makers. Some adverse impacts may be wide ranging and have effects beyond the limits of particular habitats/ecosystems or national boundaries. Therefore, environmental management plans and strategies contained in the environmental impact statement should consider regional and transboundary impacts, taking into account the ecosystem approach.

(f) Review

27. The purpose of review of the environmental impact statement is to ensure that the information for decision makers is sufficient, focused on the key issues, scientifically and technically accurate, and if the likely impacts are acceptable from an environmental viewpoint and the design complies with relevant standards and policies, or standards of good practice where official standards do not exist. The review should also consider whether all of the relevant impacts of a proposed activity have been identified and adequately addressed in the environmental impact assessment. To this end, biodiversity specialists should be called upon for the review and information on official standards and/or standards for good practice to be compiled and disseminated.

28. Public involvement, including minority groups, is important in various stages of the process and particularly at this stage. The concerns and comments of all stakeholders are considered and included in the final report presented to decision makers. The process establishes local ownership of the proposal and promotes a better understanding of relevant issues and concerns.

29. Review should also guarantee that the information provided in the environmental impact statement is sufficient for a decision maker to determine whether the project is compliant with or contradictory to the objectives of the Convention on Biological Diversity.

(g) Decision-making

30. Decision-making takes place throughout the process of environmental impact assessment in a incremental way from the screening and scoping stages to decisions during data-collecting and analysis, and impact prediction to making choices between alternatives and mitigation measures and finally the decision between refusal or authorization of the project. Biodiversity issues should play a part in decision-making throughout. This final decision is essentially a political choice about whether or not the proposal is to proceed, and under what conditions. If rejected, the project can be redesigned and resubmitted. It is desirable that the proponent and the decision-making body are two different entities.

31. The precautionary approach should be applied in decision-making in cases of scientific uncertainty about risk of significant harm to biodiversity. As scientific certainty improves, decisions can be modified accordingly.

(h) Monitoring and environmental auditing

32. Monitoring and auditing are used to see what actually occurs after project implementation has started. Predicted impacts on biodiversity should be monitored, as should the effectiveness of mitigation measures proposed in the environmental impact assessment. Proper environmental management should ensure that anticipated impacts are maintained within predicted levels, and unanticipated impacts are managed before they become a problem and the expected benefits (or positive developments) are achieved as the project proceeds. The results of monitoring provide information for periodic review and alteration of environmental management plans, and for optimizing environmental protection through good practice at all stages of the project. Biodiversity data generated by environmental impact assessment should be made accessible and useable by others and should be linked to biodiversity assessment processes being designed and carried out under the Convention on Biological Diversity.

33. An environmental audit is an independent examination and assessment of a project's (past) performance, is part of the evaluation of the environmental management plan and contributes to the enforcement of EIA approval decisions.

3. Incorporation of biodiversity considerations in strategic environmental assessments

34. The guidelines proposed for the integration of biodiversity in environmental impact assessment are also applicable to strategic environmental assessment, taking into account that for the latter type of assessment, biological diversity concerns should be considered from the early stages of the drafting process, including when developing new legislative and regulatory frameworks (decision V/18, paras. 1 (c) and 2 (a)), and at the decision-making and/or environmental planning levels (decision V/18, para. 2 (a)), and that strategic environmental assessments by their nature cover policies and programmes, a wider range of activities over a wider area.

35. Strategic environmental assessment, while not a new process, is not practised as widely as environmental impact assessment. As experience accumulates in countries, it may then be necessary to draw more specific guidelines for the incorporation of biodiversity in the process.

4. Ways and means

(a) Capacity-building

36. Any activity aimed at the incorporation of biodiversity considerations into national environmental impact assessment systems should be accompanied by appropriate capacity development activities. Expertise in taxonomy, 6/ conservation biology, ecology, and traditional knowledge is required as well as local expertise in methodologies, techniques and procedures. Environmental impact assessments should involve ecologists with extensive knowledge on the relevant ecosystem(s) in the assessment team.

37. It is also recommended to develop training workshops on biodiversity and environmental impact/strategic environmental assessment for both assessment practitioners and biodiversity specialists to build a common understanding of the issues. School and university curricula should be reviewed to ensure that they incorporate material on biodiversity conservation, sustainable development and environmental impact/strategic environmental assessment.

38. Biodiversity-relevant data should be organized in regularly updated and accessible databases, making use of rosters of biodiversity experts.

6/ See the Global Taxonomy Initiative and the programme of work (decision VI/8).

(b) Legislative authority

39. If environmental impact assessment and strategic environmental assessment procedures are incorporated into legislation, and the requirements for project/policy developers to find the most environmentally sound, efficient options that avoid, reduce or mitigate biodiversity and other adverse impacts are made explicit, this will prompt developers to, at a very early stage, use environmental impact assessment tools to improve the development process prior to the project consent stage or in some cases prior to screening procedures.

(c) Participation

40. Relevant stakeholders or their representatives, and in particular indigenous and local communities should be involved in the development of guidelines or recommendations for environmental impact assessments as well as throughout the assessment processes relevant to them, including decision-making.

(d) Incentives

41. The possible link between impact assessment and incentive measures is pointed out in decision III/18 of the Conference of the Parties, on incentive measures. In paragraph 6 of that decision, the Conference of the Parties encouraged Parties to incorporate biological diversity considerations into impact assessments as a step in the design and implementation of incentive measures. The endorsement of the impact assessment process and its implementation within a legislative framework can act as an incentive, especially if applied at the policy level, to protect and, in certain cases even restore and rehabilitate biological diversity. 7/ Financial or other incentives can also be part of a negotiated approval package for a project.

(e) Cooperation

42. Regional collaboration is of particular importance, including for the development of criteria and indicators for the evaluation of impact and possibly criteria and indicators that can provide early warning of potential threats and adequately distinguish the effects of anthropogenic activities from natural processes, and the use of standardized methods of collection, assembly and exchange of information is needed to ensure regional compatibility and accessibility of data. Guidelines and sharing of information and experiences should be made available through, *inter alia*, the Convention's clearing-house mechanism.

43. As a follow-up to the implementation of decision IV/10 C of the Conference of the Parties, collaboration between the Convention on Biological Diversity and other biodiversity-related conventions, including in particular the Ramsar Convention and the Convention on Migratory Species, which have listed sites and binding agreements on certain species, and other relevant organizations and bodies will facilitate the development and implementation of any guidelines agreed upon for the integration of biodiversity-related issues in environmental impact assessment and strategic environmental assessment. Such a collaborative approach, also embodied in resolution VII.16 of the Conference of the Parties to the Ramsar Convention ("The Ramsar Convention and impact assessment: strategic, environmental and social"), could lead to the development of an umbrella set of guidelines on impact assessment for biodiversity-related conventions.

44. Web-based resources such as the clearing-house mechanism of the Convention on Biological Diversity may help to raise awareness about best available methods and useful sources of information and experience, and should be developed and used for the provision and exchange of information on environmental impact assessment.

45. Communication between practitioners of environmental impact assessment and scientists working in the biodiversity domain is in urgent need of improvement and should be enhanced through workshops and case-study assessments. 8/

7/ UNEP/CBD/COP/4/20 and UNEP/CBD/SBSTTA/4/10.

8/ See UNEP/CBD/COP/5/INF/34.

Appendix 1

QUESTIONS PERTINENT TO SCREENING ON BIOLOGICAL DIVERSITY IMPACTS

Level of diversity	*Biological diversity perspective*	
	Conservation of biological diversity *(Non-use values)*	*Sustainable use of biodiversity* *(Use values)*
Genetic diversity (1)	(I) Does the intended activity cause a local loss of varieties/cultivars/breeds of cultivated plants and/or domesticated animals and their relatives, genes or genomes of social, scientific and economic importance?	
Species diversity (2)	(II) Does the intended activity cause a direct or indirect loss of a population of a species?	(III) Does the intended activity affect the sustainable use of a population of a species?
Ecosystem diversity (2)	(IV) Does the intended activity lead to serious damage or total loss of (an) ecosystem(s) or land-use type(s), thus leading to a loss of ecosystem diversity (i.e. the loss of indirect use values and non-use values)?	(V) Does the intended activity affect the sustainable exploitation of (an) ecosystem(s) or land-use type(s) by humans in such manner that the exploitation becomes destructive or non-sustainable (i.e. the loss of direct use values)?

(1) The potential loss of natural genetic diversity (genetic erosion) is extremely difficult to determine, and does not provide any practical clues for formal screening. The issue probably only comes up when dealing with highly threatened, legally protected species which are limited in numbers and/or have highly separated populations (rhinoceros, tigers, whales, etc.), or when complete ecosystems become separated and the risk of genetic erosion applies to many species (the reason to construct so-called eco-ducts across major line infrastructure). These issues are dealt with at species or ecosystem level.

(2) Species diversity: The level at which "population" is to be defined fully depends on the screening criteria used by a country. For example, in the process of obtaining a special status, the conservation status of species can be assessed within the boundaries of a country (for legal protection), or can be assessed globally (IUCN Red Lists). Similarly, the scale at which ecosystems are defined depends on the definition of criteria in a country.

Appendix 2

THE SCREENING CRITERIA

This is a suggested outline of a set of screening criteria, to be elaborated on country level. It only deals with biodiversity criteria and thus is an add-on to already existing screening criteria.

Category A: Environmental impact assessment mandatory:

Only in the case criteria can be based on formal legal backing, such as:

- National legislation, for example in case of impact on protected species and protected areas;
- International conventions such as CITES, the Convention on Biological Diversity, Ramsar Convention on Wetlands, etc.;

- Directives from supranational bodies, such as the European Union directive 92/43/EEC of 21 May 1992 on conservation of natural habitats and of wild fauna and flora and directive 79/409/EEC on the conservation of wild birds

Indicative list of activities for which an environmental impact assessment could be mandatory:

(a) **At the genetic level** (relates to screening question I in appendix 1 above):

- Directly or indirectly cause a local loss of legally protected varieties/cultivars/breeds of cultivated plants and/or domesticated animals and their relatives, genes or genomes of social, scientific and economic importance e.g. by introducing living modified organisms that can transfer transgenes to legally protected varieties/cultivars/breeds of cultivated plants and/or domesticated animals and their relatives

(b) **At species level** (relates to screening question II and III in appendix 1 above):

- Directly affect legally protected species, for example by extractive, polluting or other disturbing activities;

- Indirectly affect legally protected species, for example by reducing its habitat, altering its habitat in such a manner that its survival is threatened, introducing predators, competitors or parasites of protected species, alien species or GMOs;

- Directly or indirectly affect all of the above for cases which are important in respect of e.g. stop-over areas for migratory birds, breeding grounds of migratory fish, commercial trade in species protected by CITES.

- Directly or indirectly affect non-legally protected, threatened species.

(c) **At ecosystem level** (screening questions IV and V in appendix 1 above):

- Are located in legally protected areas ;

- Are located in the vicinity of legally protected areas;

- Have direct influence on legally protected areas, for example by emissions into the area, diversion of surface water that flows through the area, extraction of groundwater in a shared aquifer, disturbance by noise or lights, pollution through air.

Category B: The need for, or the level of environmental impact assessment, is to be determined:

In cases where there is no legal basis to require an environmental impact assessment, but one can suspect that the proposed activity may have a significant impact on biological diversity, or that a limited study is needed to solve uncertainties or design limited mitigation measures. This category covers the frequently referred to but difficult to use concept of "sensitive areas". As long as so-called sensitive areas do not have any legal protected status it is difficult to use the concept in practice, so a more practical alternative is provided.

The following categories of criteria point towards possible impacts on biological diversity, and further attention is thus required:

(a) **Activities in, or in the vicinity of, or with influence on areas with legal status having a probable link to biological diversity but not legally protecting biological diversity** (*relates to all five screening questions in appendix 1 above*). For example: a Ramsar site has the official recognition of having

internationally important wetland values, but this recognition does not automatically imply legal protection of biological diversity in these wetlands). Other examples include areas allocated to indigenous and local communities, extractive reserves, landscape preservation areas, sites covered by international treaties or conventions for preservation of natural and/or cultural heritage such as the UNESCO biosphere reserves and World Heritage Sites;

(b) **Impacts on biological diversity possible or likely, but the environmental impact assessment is not necessarily triggered by law:**

(i) **At the genetic level:**

- Replacing agricultural, forestry or fishery varieties or breeds by new varieties, including the introduction of living modified organisms (LMOs) (*screening questions I and II*).

(ii) **At the species level:**

- All introductions of non-indigenous species (*questions II and III*);
- All activities which directly or indirectly affect sensitive or threatened species if or in case these species are not yet protected (good reference for threatened species is provided by the IUCN Red Lists); sensitive species may be endemic, umbrella species, species at the edge of their range, or with restricted distributions, rapidly declining species (*question II*). Particular attention should be given to species which are important in local livelihoods and cultures;
- All extractive activities related to the direct exploitation of species (fisheries, forestry, hunting, collecting of plants (including living botanical and zoological resources), etc.) (*question III*);
- All activities leading to reproductive isolation of populations of species (such as line infrastructure) (*question II*);

(iii) **At the ecosystem level:**

- All extractive activities related to the use of resources on which biological diversity depends (exploitation of surface and groundwater, open pit mining of soil components such as clay, sand, gravel, etc.) (*questions IV and V*);
- All activities involving the clearing or flooding of land (*questions IV and V*);
- All activities leading to pollution of the environment (*questions IV and V*);
- Activities leading to the displacement of people (*questions IV and V*);
- All activities leading to reproductive isolation of ecosystems (*question IV*);
- All activities that significantly affect ecosystem functions that represent values for society (see appendix 3 below for a list of functions provided by nature). Some of these functions depend on relatively neglected taxa;
- All activities in areas of known importance for biological diversity (*questions IV and V*), such as areas containing high diversity (hot spots), large numbers of endemic or threatened species, or wilderness; required by migratory species; of social, economic, cultural or scientific importance; or which are representative, unique (e.g. where rare

or sensitive species occur) or associated with key evolutionary or other biological processes.

Category C: no environmental impact assessment required

Activities which are not covered by one of the categories A or B, or are designated as category C after initial environmental examination.

The generic nature of these guidelines does not allow for the positive identification of types of activities or areas where environmental impact assessment from a biodiversity perspective is not needed. At country level, however, it will be possible to indicate geographical areas where biological diversity considerations do not play a role of importance and, conversely, areas where they do play an important role (biodiversity-sensitive areas).

Appendix 3

INDICATIVE LIST (NON-EXHAUSTIVE) OF EXAMPLES OF FUNCTIONS OF THE NATURAL ENVIRONMENT THAT ARE DIRECTLY (FLORA AND FAUNA) OR INDIRECTLY (SERVICES PROVIDED BY ECOSYSTEMS SUCH AS WATER SUPPLY) DERIVED FROM BIOLOGICAL DIVERSITY.

Production functions

Natural production

- Timber production
- Firewood production
- Production of harvestable grasses (construction and artisanal use)
- Naturally produced fodder & manure
- Harvestable peat
- Secondary (minor) products
- Harvestable bush meat (food)
- Fish and shellfish productivity
- Drinking water supply
- Supply of water for irrigation and industry
- Water supply for hydroelectricity
- Supply of surface water for other landscapes
- Supply of ground water for other landscapes

Nature-based human production

- Crop productivity
- Tree plantations productivity
- Managed forest productivity
- Rangeland/livestock productivity
- Aquaculture productivity (freshwater)
- Mariculture productivity (brackish/saltwater)

Carrying functions

- Suitability for constructions
- Suitability for indigenous settlement
- Suitability for rural settlement
- Suitability for urban settlement
- Suitability for industry
- Suitability for infrastructure
- Suitability for transport infrastructure
- Suitability for shipping / navigation
- Suitability for road transport
- Suitability for rail transport
- Suitability for air transport
- Suitability for power distribution
- Suitability for use of pipelines
- Suitability for leisure and tourism activities
- Suitability for nature conservation

Processing and regulation functions

Land-based processing and regulation functions

- Decomposition of organic material (land based)
- Natural desalinization of soils
- Development / prevention of acid sulphate soils
- Biological control mechanisms
- Seasonal cleansing of soils
- Soil water storage capacity
- Coastal protection against floods
- Coastal stabilization (against accretion / erosion)
- Soil protection

Water related processing and regulation functions

- Water filtering function
- Dilution of pollutants function
- Discharge of pollutants function
- Flushing / cleansing function
- Bio-chemical/physical purification of water
- Storage for pollutants function
- Flow regulation for flood control
- River base flow regulation
- Water storage capacity
- Ground water recharge capacity
- Regulation of water balance
- Sedimentation / retention capacity
- Protection against water erosion
- Protection against wave action
- Prevention of saline groundwater intrusion
- Prevention of saline surface-water intrusion
- Transmission of diseases

Air-related processing and regulation functions

- Filtering of air
- Carry off by air to other areas
- Photo-chemical air processing (smog)
- Wind breaks
- Transmission of diseases
- Carbon sequestration

Biodiversity-related regulation functions

- Maintenance of genetic, species and ecosystem composition
- Maintenance of horizontal and vertical spatial structure, and of temporal structure
- Maintenance of key processes for structuring or maintaining biological diversity
- Maintenance of pollinator services

Signification functions

Cultural/religious/scientific/landscape functions

Appendix 4

BIODIVERSITY CHECKLIST ON SCOPING FOR THE IDENTIFICATION OF THE IMPACTS OF PROPOSED PROJECTS ON COMPONENTS OF BIODIVERSITY (NOT EXHAUSTIVE).

		COMPONENTS OF BIOLOGICAL DIVERSITY			
		Composition	***Structure (temporal)***	***Structure (spatial: horizontal and vertical)***	***Key processes***
LEVELS OF BIOLOGICAL DIVERSITY	**Genetic diversity**	▪ Minimal viable population (avoid destruction by inbreeding / gene erosion) ▪ Local cultivars. ▪ Living modified organisms.	▪ Cycles with high and low genetic diversity within a population.	▪ Dispersal of natural genetic variability ▪ Dispersal of agricultural cultivars.	▪ Exchange of genetic material between populations (gene flow) ▪ Mutagenic influences ▪ Intraspecific competition
	Species diversity	▪ Species composition, genera, families etc, rarity / abundance, endemism / exotics ▪ Population size and trends ▪ Known key species (essential role) ▪ Conservation status	▪ Seasonal, lunar, tidal, diurnal rhythms (migration, breeding, flowering, leaf development, etc.) ▪ Reproductive rate, fertility, mortality, growth rate. ▪ Reproductive strategy.	▪ Minimal areas for species to survive. ▪ Essential areas (stepping stones) for migrating species. ▪ Niche requirements within ecosystem (substrate preference, layer within ecosystem) ▪ Relative or absolute isolation	▪ Regulation mechanisms such as predation, herbivory, parasitism,. ▪ Interactions between species. ▪ Ecological function of a species
	Ecosystem diversity	▪ Types and surface area of ecosystems ▪ Uniqueness / abundance ▪ Succession stage, existing disturbances and trends (=autonomous development)	▪ Adaptations to / dependency ***on*** regular rhythms: seasonal ▪ Adaptations to / dependency of ***on*** irregular events: droughts, floods, frost, fire, wind ▪ Succession (rate)	▪ Spatial relations between landscape elements (local and remote) ▪ Spatial distribution (continuous or discontinuous / patchy); ▪ Minimal area for ecosystem to survive. ▪ Vertical structure (layered, horizonts, stratified).	▪ Structuring process(es) of key importance for the maintenance of the ecosystem itself or for other ecosystems.

/…

B. Designing national-level monitoring programmes and indicators

The Conference of the Parties

1. *Requests* the Executive Secretary to report on the development and use of indicators in all the thematic areas and cross cutting issues to the Subsidiary Body on Scientific, Technical and Technological Advice prior to the seventh meeting of the Conference of the Parties;

2. *Urges* Parties that have yet not done so to respond to the questionnaire on the subject of indicators that was sent by the Executive Secretary in May 2001 so as to enable the Executive Secretary to update the analysis;

3. *Requests* the Executive Secretary to convene a meeting of an expert group that is broadly representative of experts from both United Nations and biogeographical regions. The group should further develop the three annexes to the note of the Executive Secretary on ongoing work on indicators 9/ on:

(a) Principles for developing national-level monitoring and indicators;

(b) A set of standard questions for developing national–level indicators; and

(c) A list of available and potential indicators based on a conceptual framework that has qualitative and quantitative approach;

4. *Requests* the Executive Secretary to report to a meeting of the Subsidiary Body on Scientific, Technical and Technological Advice prior to the seventh meeting of the Conference of Parties. In doing so, the Executive Secretary should take into account the specific comments of delegates in the seventh meeting of the Subsidiary Body on Scientific, Technical and Technological Advice and the following guidance:

(a) Give particular attention to the note by the Executive Secretary on recommendations for a core set of indicators on biological diversity prepared for the third meeting of the Subsidiary Body 10/ and background paper prepared for the same meeting by the liaison group on indicators of biological diversity 11/ and subsequent related papers;

(b) Consider development and segregation of the key questions contained in annex II to the note by the Executive Secretary on ongoing work on indicators 9/ according to the three levels of biodiversity, and reorder them to correspond to articles of the convention as far as possible, and give attention to the use of early warning indicators;

(c) Consider developing and organizing the list of indicators for each thematic area grouped as driver, pressure, state, impact and response to pressure on biodiversity;

(d) Regional approaches to indicator development should be promoted in order to assess the status and trends of biodiversity. For the development of the list of indicators, there is a need for harmonization and collaboration with regional and international initiatives, including the Organisation for Economic Co-operation and Development, the Commission on Sustainable Development, the Ramsar Convention on Wetlands, the Pan-European processes (the Pan-European Biological and Landscape Strategy and the Ministerial Conference on the Protection of Forests in Europe), the Montreal process on criteria and indicators for the conservation and sustainable management of temperate and boreal forests, the Food and Agriculture Organization of the United Nations and the United Nations Forum on Forests;

9/ UNEP/CBD/SBSTTA/7/12.

10/ UNEP/CBD/SBSTTA/3/9.

11/ UNEP/CBD/SBSTTA/3/INF.13.

(e) Note that the list of indicators should provide a resource that will support users in identifying the most appropriate indicators for their needs, and to access experience in other countries, regions and sectors, and that indicators must be policy and management relevant.

C. Scientific assessments

The Conference of the Parties

1. *Welcomes* the outline for the assessment reports developed by the Millennium Ecosystem Assessment; 12/

2. *Encourages* Parties to support the involvement of experts in the Millennium Ecosystem Assessment process and provide assistance to developing countries and countries with economics in transition that are interested in undertaking national or regional assessments within the framework of the Millennium Ecosystems Assessment;

3. *Requests* the Subsidiary Body on Scientific, Technical, and Technological Advice to review the findings of the Millennium Ecosystem Assessment and provide recommendations to the Conference of the Parties based on the review;

4. *Recognizing* the importance of the assessment of the status of the world's protected areas, 13/ *encourages* the Executive Secretary, in close collaboration with the World Conservation Monitoring Centre of the United Nations Environment Programme and IUCN, to facilitate development and implementation of this assessment.

12/ UNEP/CBD/COP/6/INF/38, annex I.

13/ UNEP/CBD/COP/6/INF/25.

"Wetlands: water, life, and culture"
8th Meeting of the Conference of the Contracting Parties to the Convention on Wetlands (Ramsar, Iran, 1971)
Valencia, Spain, 18-26 November 2002

Resolution VIII.9

'Guidelines for incorporating biodiversity-related issues into environmental impact assessment legislation and/or processes and in strategic environmental assessment' adopted by the Convention on Biological Diversity (CBD), and their relevance to the Ramsar Convention

1. WELCOMING the adoption by COP6 of the Convention on Biological Diversity (CBD) of the *Guidelines for incorporating biodiversity-related issues into environmental impact assessment legislation and/or processes and in strategic environmental assessment* and *Recommendations for the conduct of cultural, environmental and social impact assessment regarding developments proposed to take place on, or which are likely to impact on, sacred sites and on lands and waters traditionally occupied or used by indigenous and local communities*;

2. RECALLING Recommendation 6.2, in which the Contracting Parties urged that environmental considerations for wetlands be integrated into planning decisions in a clear and publicly transparent manner, and in which they requested the Convention's Scientific and Technical Review Panel (STRP) to examine existing environmental impact assessment (EIA) guidelines relevant to wetlands and, if necessary, arrange for the drafting of Ramsar guidelines, as an aid to the wise use of wetlands;

3. FURTHER RECALLING Resolution VII.16, which "calls upon Contracting Parties to ensure that any projects, plans, programmes and policies with the potential to alter the ecological character of wetlands on the Ramsar List or impact negatively on other wetlands in their territory, are subjected to rigorous impact assessment procedures and to formalise such procedures under policy, legal, institutional and organizational arrangements"; and which requested "the Scientific and Technical Review Panel and the Ramsar Bureau to work in cooperation with their counterparts from the CBD and other relevant conventions and expert organizations, to review existing guidelines and available information on environmental impact assessment and economic valuation of wetlands", and indicated that this could be reported as an Internet-based resource kit on the use of these tools for identifying opportunities to apply the wise use principle;

4. AWARE that the Joint Work Plan 2000-2001 of the CBD and Ramsar encouraged close cooperation in taking forward their respective programmes on impact assessment and minimizing adverse impacts, in consultation with IUCN -The World Conservation Union, the International Association for Impact Assessment (IAIA), and others;

5. ALSO AWARE that CBD Decision V/18 requested the preparation of further guidelines for incorporating biodiversity-related issues into EIA legislation and/or processes and in

strategic environmental assessment, and referred to collaboration with the STRP on matters of impact assessment;

6. ACKNOWLEDGING the adoption by COP7 of the Convention on Migratory Species of Resolution 7.10 on Impact Assessment on Migratory Species which, *inter alia*, requests the CMS Scientific Council to cooperate with the Ramsar STRP in reviewing and identifying gaps in relevant guidance;

7. WELCOMING the signing in June 2001 of a Memorandum of Understanding between the Ramsar Bureau and the IAIA;

8. EMPHASIZING the importance of impact assessment in key processes of the Ramsar Convention, including water allocations and management, management planning, and cases of boundary change and compensation for sites on the List of Wetlands of International Importance, and NOTING that the additional guidance on these matters adopted by this meeting of the Conference of the Parties refers to the application of impact assessments, and that it stresses the importance of the full involvement of local communities and indigenous peoples in an open and transparent manner; and

9. RECOGNIZING the role of impact assessment in wetland restoration and rehabilitation, including the identification of possibilities for mitigation for lost wetlands;

THE CONFERENCE OF THE CONTRACTING PARTIES

10. URGES Contracting Parties to make use, as appropriate, of the *Guidelines for incorporating biodiversity-related issues into environmental impact assessment legislation and/or processes and in strategic environmental assessment*, as adopted by Decision VI/7 of CBD COP6, with the assistance of the guidance prepared by the STRP and imbedded in the text of the CBD Guidelines, as shown in the annex to this Resolution; and to encourage full participation of local communities and indigenous peoples in impact assessments, in line with these guidelines, the *Guidelines for establishing and strengthening local communities' and indigenous people's participation in the management of wetlands* (Resolution VII.8), and *the New Guidelines for management planning for Ramsar sites and other wetlands* (Resolution VIII.14);

11. FURTHER URGES Contracting Parties to make use of the tools and information on impact assessment compiled by IUCN in their Biodiversity Economics Web site, http://www.biodiversityeconomics.org/assessment/ramsar-503-01.htm, created in response to Resolution VII.16 in order to assist in their practical application of good practice in impact assessment relevant to wetlands;

12. REQUESTS Contracting Parties to provide feedback to the Ramsar Bureau on the extent to which materials available on the IUCN Biodiversity Economics Web site are useful for their needs, and in light of this to indicate more precisely the nature of their needs for further information, advice and guidance on impact assessment relevant to wetlands;

13. URGES Contracting Parties and others to provide relevant materials to the Ramsar Bureau, including case studies indicating lessons learned, guidelines, sources of advice, and other relevant materials on impact assessment relevant to wetlands for incorporation into the IUCN Biodiversity Economics Web site;

14. REQUESTS the Scientific and Technical Review Panel and the Ramsar Bureau to prepare a synthesis of lessons learned from those case studies submitted, including indications of linkages with existing Ramsar guidance on other topics where relevant, to prepare a report for COP9, and to provide expert assistance when appropriate;

15. ALSO REQUESTS the STRP, in collaboration with IAIA, to continue to identify wetland-related elements of existing guidelines on impact assessment, to identify important gaps where such guidance is failing fully to meet the needs of Contracting Parties, and to investigate possible ways of filling such gaps, taking into account the *Recommendations for the conduct of cultural, environmental and social impact assessment regarding developments proposed to take place on, or which are likely to impact on, sacred sites and on lands and waters traditionally occupied or used by indigenous and local communities* adopted by CBD's COP6;

16. FURTHER REQUESTS the STRP, with the assistance of the Ramsar Bureau, to conduct a review, as a supplement to that presented in Technical Session A of Ramsar COP6 in 1996, of references to impact assessment in Ramsar COP decisions, guidelines and other Ramsar publications, and in particular to identify and seek to correct if necessary any inconsistencies of approach, and to make the results of such review available as an updated index of references to impact assessment in Ramsar materials;

17. URGES Contracting Parties to establish contact with the relevant national contact points from within the networks of the IAIA with a view to identifying sources of expertise and advice for assisting with wetland-related impact assessment;

18. REQUESTS the STRP to prepare advice for Contracting Parties on applying strategic environmental assessment in the context of the Convention's *Guidelines on reviewing laws and institutions to promote the conservation and wise use of wetlands* (Ramsar Handbook 3) and *Guidelines for developing and implementing National Wetland Policies* (Ramsar Handbook 2); and

19. RECOMMENDS that Contracting Parties and impact assessment practitioners seek to use impact assessments, particularly where they are related to mitigation projects, as opportunities to stimulate the adoption of, and to contribute to, strategically-determined targets for wetland conservation, management, enhancement, rehabilitation and restoration.

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Annex

The following guidelines were prepared by the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) of the Convention on Biological Diversity (CBD) and adopted (Decision VI/7) by CBD's Conference of the Contracting Parties at its 6th meeting (Den Haag, Netherlands, April 2002). The CBD guidelines were reviewed by Ramsar's Scientific and Technical Review Panel (STRP), which recommended that they are fully appropriate for application for impact assessment concerning wetlands in the Ramsar context.

The STRP has prepared supplementary guidance to assist Ramsar Parties in their application, as appropriate, of the CBD Guidelines to impact assessment on wetlands. This supplementary guidance is provided as boxed italic text in the relevant parts of the CBD guidelines.

CBD Guidelines for incorporating biodiversity related issues into environmental impact assessment legislation and/or processes and in strategic environmental assessment

Ramsar: For the purpose of the use of these Guidelines in a Ramsar Convention context, references to "biodiversity" as the scope of interest covered, or of the type of expertise engaged, can be read as applying equally to the conservation and wise use of wetlands, including limnology and hydrology, addressed by the Ramsar Convention. In applying the definitions given in paragraph 1 below, particular emphasis should be given to analysis of alternatives and inclusion of decision-making in the impact assessment process.

1. For the purpose of these guidelines, the following definitions are used for environmental impact assessment and strategic environmental assessment:

   (a) Environmental impact assessment is a process of evaluating the likely environmental impacts of a proposed project or development, taking into account inter-related socio-economic, cultural and human-health impacts, both beneficial and adverse. Although legislation and practice vary around the world, the fundamental components of an environmental impact assessment would necessarily involve the following stages:

      i) Screening to determine which projects or developments require a full or partial impact assessment study;
      ii) Scoping to identify which potential impacts are relevant to assess, and to derive terms of reference for the impact assessment;
      iii) Impact assessment to predict and identify the likely environmental impacts of a proposed project or development taking into account inter-related consequences of the project proposal, and the socio-economic impacts.;
      iv) Identifying mitigation measures (including not proceeding with the development, finding alternative designs or sites which avoid the impacts, incorporating safeguards in the design of the project, or providing compensation for adverse impacts);
      v) Deciding whether to approve the project or not; and
      vi) Monitoring and evaluating the development activities, predicted impacts and proposed mitigation measures to ensure that unpredicted impacts or failed mitigation measures are identified and addressed in a timely fashion.

(b) Strategic environmental assessment is the formalized, systematic and comprehensive process of identifying and evaluating the environmental consequences of proposed policies, plans or programmes to ensure that they are fully included and appropriately addressed at the earliest possible stage of decision-making on a par with economic and social considerations. [1/] Strategic environmental assessment, by its nature, covers a wider range of activities or a wider area and often over a longer time span than the environmental impact assessment of projects. Strategic environmental assessment might be applied to an entire sector, (such as a national policy on energy for example), or to a geographical area, (for example in the context of a regional development scheme). The basic steps of strategic environmental assessment are similar to the steps in environmental impact assessment procedures, [2/] but the scope differs. Strategic environmental assessment does not replace or reduce the need for project-level environmental impact assessment, but it can help to streamline the incorporation of environmental concerns (including biodiversity) into the decision-making process, often making project-level environmental impact assessment a more effective process.

1. Purpose and approach

2. The objective of these draft guidelines is to provide general advice on incorporation of biodiversity considerations into new or existing environmental impact assessment procedures, noting that existing procedures take biodiversity into consideration in different ways. A draft framework has been developed to address the screening and scoping phases of environmental impact assessment. Further development of the framework will be required to address the incorporation of biodiversity into subsequent stages of the environmental impact assessment process, including impact assessment, mitigation, evaluation and monitoring, and into strategic environmental assessment.

3. Individual countries may redefine the steps in the procedure to their needs and requirements as befits their institutional and legal setting. The environmental impact assessment process, in order to be effective, should be fully incorporated into existing legal planning processes and not be seen as an "add-on" process.

4. As a prerequisite, the definition of the term "environment" in national legislation and procedures should fully incorporate the concept of biological diversity as defined by the Convention on Biological Diversity, such that plants, animals and micro-organisms are considered at the genetic, species/community and ecosystem/habitat levels, and also in terms of ecosystem structure and function.

5. With regard to biodiversity considerations, the ecosystem approach, as described in decision V/6 of the Conference of the Parties and taking into account any further elaboration of the concept within the framework of the Convention, is an appropriate framework for the assessment of planned action and policies. In accordance with the approach, the proper temporal and spatial scales of the problems should be determined as well as the functions of biodiversity and their tangible and intangible values for humans

1/ Based on Sadler and Verheem, 1996

2/ Saddler and Verheem, 1996; South Africa, 2000; Nierynck, 1997 ; Nooteboom, 1999.

that could be affected by the proposed project or policy, the type of adaptive mitigation measures and the need for the participation of stakeholders in decision-making.

Ramsar: In a Ramsar context, the appropriate spatial scale may sometimes be wider than the ecosystem. In particular, the river basin (water catchment) is an important spatial scale at which to address aspects of wetland-related impacts. Also, where impacts on particularly important species values, such as migratory fish or birds, are at stake, assessment at the scale of the migratory range (flyway) of the relevant populations will be very relevant. This may involve a chain of ecosystems (perhaps disjunct ones), and therefore may need to take a broader perspective than would normally be the case under the ecosystem approach.

6. Environmental impact assessment procedures should refer to other relevant national, regional and international legislation, regulations, guidelines and other policy documents such as the national biodiversity strategy and action plan documents, the Convention on Biological Diversity and biodiversity-related conventions and agreements including, in particular, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the Convention on the Conservation of Migratory Species of Wild Animals and the related agreements, the Ramsar Convention on Wetlands of International Importance Especially as Waterfowl Habitat, the Convention on Environmental Impact Assessment in a Transboundary Context; the United Nations Convention on the Law of the Sea; the European Union directives on environmental impact assessment, and the Protocol for the Protection of the Mediterranean Sea against Pollution from Land-based Sources.

Ramsar: At the national level, reference should also be made to the national wetland policy (see Resolution VII.6) where this exists.

7. Consideration should be given to improving integration of National Biodiversity Strategy and Action Plans (NBSAP) and National Development Strategies using SEA as a tool for such integration to promote the establishment of clear conservation targets through the NBSAP process and the use of those targets for the screening and scoping targets of EIA and for developing mitigation measures.

2. Biodiversity issues at different stages of environmental impact assessment

(a) Screening

8. Screening is used to determine which proposals should be subject to impact assessment, to exclude those unlikely to have harmful environmental impacts and to indicate the level of environmental appraisal required. If screening criteria do not include biodiversity measures, there is a risk that proposals with potentially significant impacts on biodiversity will be screened out.

9. Since a legal requirement for environmental impact assessment on environmental grounds does not guarantee that biological diversity will be taken into account, consideration should be given to incorporating biodiversity criteria into existing or new screening criteria..

10. Types of existing screening mechanisms include:

(a) Positive lists identifying projects requiring environmental impact assessment. A few countries use (or have used) negative lists, identifying those projects not subject to environmental impact assessment. These lists should be reassessed to evaluate their inclusion of biodiversity aspects;

(b) Expert judgement (with or without a limited study, sometimes referred to as "initial environmental examination" or "preliminary environmental assessment"); and

(c) A combination of a positive list and expert judgement; for a number of activities an environmental impact assessment is more appropriate, for others an expert judgement may be desirable to determine the need for an environmental impact assessment.

11. The result of screening can be that:

(a) An environmental impact assessment is required,

(b) (i) A limited environmental study is sufficient because only limited environmental impacts are expected; the screening decision is based on a set of criteria with quantitative norms or threshold values;
(ii) There is still uncertainty whether an environmental impact assessment is required and an initial environmental examination has to be conducted to determine whether a project requires environmental impact assessment or not, and

(c) The project does not require an environmental impact assessment.

12. How to use these guidelines?

(a) Countries with a positive list identifying projects requiring environmental impact assessment should use, as appropriate, annexes I and II below for guidance on reconsidering their existing positive list with respect to biological diversity considerations. By assessing the possible impacts of categories of activities on biological diversity the existing list can be adjusted, if required;

(b) In countries where screening is based on expert judgement, experience has shown that professionals make screening decisions, often using "mini environmental impact assessment" to come to this decision. These guidelines, its annexes and other guidelines such as the information document submitted by the International Association for Impact Assessment (IAIA) help provide these professionals with the means to come to a motivated, transparent and consistent screening decision. Furthermore, the expert teams should include professionals with biodiversity expertise;

(c) In countries where screening is based on a combination of a positive list and expert judgement, country-specific thematic or sector guidelines, often including quantitative norms or thresholds, facilitate the responsible people to make a well-

founded and defendable decision. For biodiversity, thematic guidelines could be developed, [3/] sector guidelines need to be reviewed on biodiversity considerations.

The screening criteria

13. Screening criteria may relate to: (i) categories of activities, including thresholds referring to magnitude of the activity and/or size of the intervention area, duration and frequency or to (ii) a magnitude of biophysical change that is caused by the activity, or to (iii) maps indicating areas important for biodiversity with special legal status or of high biodiversity value and endemism, species patterns, breeding sites, or areas with species of high genetic value.

Ramsar: Projects with possible implications for a listed Ramsar site are an example of the third type of screening criterion given above. This should extend to sites selected according to any of the Ramsar criteria, and not just those relating to the biodiversity importance of the wetland.

14. Determining norms or threshold values is partly a technical and partly a political process of which the outcome may vary for countries and for ecosystems. The technical process should at least provide a description of:

    (a) Categories of activities that may affect biological diversity and the direct and indirect biophysical changes likely to result from these activities, taking into account characteristics like: type or nature of activity, magnitude, extent/location, timing, duration, reversibility/irreversibility, likelihood, and significance; possibility of interaction with other activities or impacts;

    (b) Area of influence. Knowing the biophysical changes that result from an activity, the expected area of influence of these changes can be modelled or predicted, including the probability of off-site effects;

    (c) Biodiversity maps indicating ecosystems and/or land-use types and their use and non-use values (showing the use and non-use values of biodiversity).

Ramsar: In addressing the likelihood of effects and their relevance and significance for Ramsar-related values, reference should be made to Ramsar guidance on ecological character and on risk assessment (see e.g. Resolution VII.10).

15. The process of developing a national biodiversity strategy and action plan can generate valuable information such as conservation priorities and targets which can guide further development of environmental impact assessment screening criteria. [4/] Annex II below presents a generic list of criteria, intended to be a practical reference for further in-country development of criteria.

Ramsar: This also applies to the process for developing a national wetland policy (see Resolution VII.6).

3/ Some concrete targets are proposed in the note by the Executive Secretary on a proposal for a global strategy for plant conservation (UNEP/CBD/SBSTTA/7/10).

4/ Summarized in the IAIA information document by Treweek, 2001, box 2.

Pertinent questions for screening

16. Considering the objectives of the Convention on Biological Diversity, i.e., in particular, conservation, sustainable use and equitable sharing of benefits derived from biological diversity, fundamental questions need to be answered in an environment impact assessment study:

    (a) Does the intended activity affect the physical environment in such a manner or cause such biological losses that it influences the chance of extinction of cultivars, varieties, populations of species, or the chance of loss of habitats or ecosystems?

    (b) Does the intended activity surpass the maximal sustainable yield, the carrying capacity of a habitat/ecosystem or the maximum and minimum 5/ allowable disturbance level of a resource, population, or ecosystem?

    (c) Does the intended activity result in changes to the access to and rights over biological resources?

17. To facilitate the development of criteria, the questions above have been reformulated for the three levels of diversity, reproduced in annex I below.

Ramsar: The objectives of the Ramsar Convention should be considered in the same way, i.e. promoting the conservation of wetlands, promoting the wise use of wetlands, and the implied objective of maintaining the ecological character of wetlands, as defined by Resolution VII.10. Questions (a) and (b) above remain relevant, but two additional questions should also be asked concerning wetlands:

(d) Does the intended activity cause an imbalance in any biological, physical or chemical components of the wetland ecosystem, or in their interactions, which maintain the wetland and its products, functions and attributes? (i.e. does it cause a change in ecological character as defined under the Convention), and

(e) Does the intended activity constitute a use which would be "unwise" in the sense of conflicting with the tenets of "wise use of wetlands" as defined under the Convention in e.g. Recommendation 3.3, Recommendation 4.10 and Resolution V.6?

(b) Scoping

18. Scoping narrows the focus of the broad issues found to be significant during the screening stage. It is used to derive terms of reference (sometimes referred to as guidelines) for environmental impact assessment. Scoping also enables the competent authority (or environmental impact assessment professionals in countries where scoping is voluntary):

    (a) To guide study teams on significant issues and alternatives to be assessed, clarify how they should be examined (methods of prediction and analysis, depth of analysis), and according to which guidelines and criteria;

    (b) To provide an opportunity for stakeholders to have their interests taken into account in the environmental impact assessment;

5/ For example, fire can be too frequent and too infrequent to sustain the integrity/health of a given ecosystem.

(c) To ensure that the resulting environmental impact statement is useful to the decision maker and is understandable to the public.

19. During the scoping phase promising alternatives can be identified for in-depth consideration during the environmental impact assessment study.

20. The following sequence provides an example of iterative mechanism for scoping, impact assessment and consideration of mitigation measures, which should be carried out with the help of existing information and the available knowledge among stakeholders:

(a) Describe the type of project, its nature, magnitude, location, timing, duration and frequency;

(b) Describe the expected biophysical changes in soil, water, air, flora and fauna;

(c) Describe biophysical changes that result from social change processes as a result of the proposed project;

(d) Determine the spatial and temporal scale of influence of each biophysical change;

(e) Describe ecosystems and land-use types potentially influenced by the biophysical changes identified;

(f) Determine for each ecosystem or land-use type if the biophysical changes affect one of the following components of biological diversity: the composition (what is there), the temporal/spatial structure (how are biodiversity components organised in time and space), or key processes (how is biodiversity created and/or maintained);

(g) Identify in consultation with stakeholders the current and potential use-functions, non-use functions and other longer-term less tangible benefits of biological diversity provided by the ecosystems or land-use types and determine the values these functions represent for society (see annex III for an indicative list of functions);

(h) Determine which of these functions will be significantly affected by the proposed project, taking into account mitigation measures;

(i) For each alternative, define mitigation and/or compensation measures to avoid, minimize or compensate the expected impacts;

(j) With the help of the biodiversity checklist on scoping (see annex IV below), determine which issues will provide information relevant to decision making and can realistically be studied;

(k) Provide information on the severity of impacts, i.e. apply weights to the expected impacts for the alternatives considered. Weigh expected impacts to a reference situation (baseline), which may be the existing situation, a historical situation, or an external reference situation.

Ramsar: In the case of Ramsar sites, the "baseline" should relate to the site's ecological character, as distinct from the attributes which cause it to qualify as internationally important. Hence the baseline should be the target condition (ecological character) described in management plan objectives. It will therefore not necessarily equate to the condition of the site described at the time of listing (or subsequent updating of the Ramsar Information Sheet) unless at such times the site happens to have achieved its optimal (target) condition, or if there is no better baseline available.

(l) Identify necessary surveys to gather comprehensive information about the biological diversity in the affected area where appropriate.

21. The expected impacts of the proposed activity, including identified alternatives, should be compared with the selected reference situation and with the autonomous development (what will happen with biodiversity over time if the project is not implemented). There should be awareness that doing nothing may in some cases also have significant effects on biological diversity, sometimes even worse than the impacts of the proposed activity (e.g. projects counteracting degradation processes).

22. At present, evaluation criteria for biological diversity, especially at ecosystem level, are under-developed and need serious attention when developing in-country mechanisms to incorporate biodiversity in environmental impact assessment.

(c) Impact analysis and assessment

23. Environmental impact assessment should be an iterative process of assessing impacts, redesigning alternatives and comparison. The main tasks of impact analysis and assessment are:

(a) Refinement of the understanding of the nature of the potential impacts identified during screening and scoping and described in the terms of reference. This includes the identification of indirect and cumulative impacts, and of the likely causes of the impacts (impact analysis and assessment). Identification and description of relevant criteria for decision-making can be an essential element of this period;

(b) Review and redesign of alternatives; consideration of mitigation measures; planning of impact management; evaluation of impacts; and comparison of the alternatives; and

(c) Reporting of study results in a environmental impact statement.

24. Assessing impacts usually involves a detailed analysis of their nature, magnitude, extent and effect, and a judgement of their significance, i.e., whether the impacts are acceptable to stakeholders, require mitigation, or are just unacceptable. Biodiversity information available is usually limited and descriptive and cannot be used as a basis for numerical predictions. There is a need to develop or compile biodiversity criteria for impact evaluation and to have measurable standards or objectives against which the significance of individual impacts can be evaluated. The priorities and targets set in the national biodiversity action plan and strategy process can provide guidance for developing these criteria. Tools will need to be developed to deal with uncertainty, including criteria on using risk assessment techniques, precautionary approach and adaptive management.

Ramsar: In addressing the nature of effects and their relevance and significance for Ramsar-related values, reference should be made to Ramsar guidance on ecological character and on risk assessment (see e.g. Resolution VII.10).

(d) Consideration of mitigation measures

25. If the evaluation process concludes that the impacts are significant, the next stage in the process is to propose mitigation ideally drawn together into an "environmental management plan". The purpose of mitigation in environmental impact assessment is to look for better ways to implement project activities so that negative impacts of the activities are avoided or reduced to acceptable levels and the environmental benefits are enhanced, and to make sure that the public or individuals do not bear costs which are greater than the benefits which accrue to them. Remedial action can take several forms, i.e. avoidance (or prevention), mitigation (including restoration and rehabilitation of sites), and compensation (often associated with residual impacts after prevention and mitigation).

Ramsar: In certain circumstances relating to Ramsar sites, when the consequences of impacts on the site include reduction or deletion of the site, the provision of compensation is governed by Article 4.2 of the Convention and the guidelines adopted under Resolution VIII.20 will apply.

(e) Reporting: the environmental impact statement (EIS)

26. The environmental impact statement is designed to assist: (i) the proponent to plan, design and implement the proposal in a way that eliminates or minimizes the negative effect on the biophysical and socio-economic environments and maximizes the benefits to all parties in the most cost effective manner; (ii) the Government or responsible authority to decide whether a proposal should be approved and the terms and conditions that should be applied; and (iii) the public to understand the proposal and its impacts on the community and environment and provide an opportunity for comments on the proposed action for consideration by decision-makers. Some adverse impacts may be wide ranging and have effects beyond the limits of particular habitats/ecosystems or national boundaries. Therefore, environmental management plans and strategies contained in the environmental impact statement should consider regional and transboundary impacts, taking into account the ecosystem approach.

Ramsar: Concerning transboundary impacts, Ramsar Parties should have regard to Article 5 of the Convention and the Guidelines for international cooperation under the Ramsar Convention on Wetlands *(Resolution VII.19).*

(f) Review

27. The purpose of review of the environmental impact statement is to ensure that the information for decision-makers is sufficient, focused on the key issues, scientifically and technically accurate, and if the likely impacts are acceptable from an environmental viewpoint and the design complies with relevant standards and policies, or standards of good practice where official standards do not exist. The review should also consider whether all of the relevant impacts of a proposed activity have been identified and adequately addressed in the environmental impact assessment. To this end, biodiversity

specialists should be called upon for the review and information on official standards and/or standards for good practice to be compiled and disseminated.

28. Public involvement, including minority groups, is important in various stages of the process and particularly at this stage. The concerns and comments of all stakeholders are considered and included in the final report presented to decision-makers. The process establishes local ownership of the proposal and promotes a better understanding of relevant issues and concerns.

Ramsar: For guidance on public involvement, refer to the Guidelines for establishing and strengthening local communities' and indigenous people's participation in the management of wetlands *(Resolution VII.8) and the* New Guidelines for management planning for Ramsar sites and other wetlands *(Resolution VIII.14).*

29. Review should also guarantee that the information provided in the environmental impact statement is sufficient for a decision maker to determine whether the project is compliant with or contradictory to the objectives of the Convention on Biological Diversity.

Ramsar: This paragraph should be applied mutatis mutandis *to the Ramsar Convention.*

(g) Decision-making

30. Decision-making takes place throughout the process of environmental impact assessment in a incremental way from the screening and scoping stages to decisions during data-collecting and analysis, and impact prediction to making choices between alternatives and mitigation measures and finally the decision between refusal or authorization of the project. Biodiversity issues should play a part in decision-making throughout. This final decision is essentially a political choice about whether or not the proposal is to proceed, and under what conditions. If rejected, the project can be redesigned and resubmitted. It is desirable that the proponent and the decision-making body are two different entities.

31. The precautionary approach should be applied in decision-making in cases of scientific uncertainty about risk of significant harm to biodiversity. As scientific certainty improves, decisions can be modified accordingly.

(h) Monitoring and environmental auditing

32. Monitoring and auditing are used to see what actually occurs after project implementation has started. Predicted impacts on biodiversity should be monitored, as should the effectiveness of mitigation measures proposed in the environmental impact assessment. Proper environmental management should ensure that anticipated impacts are maintained within predicted levels, and unanticipated impacts are managed before they become a problem and the expected benefits (or positive developments) are achieved as the project proceeds. The results of monitoring provide information for periodic review and alteration of environmental management plans, and for optimising environmental protection through good practice at all stages of the project. Biodiversity data generated by environmental impact assessment should be made accessible and useable by others and should be linked to biodiversity assessment processes being designed and carried out under the Convention on Biological Diversity.

33. An environmental audit is an independent examination and assessment of a project's (past) performance, is part of the evaluation of the environmental management plan and contributes to the enforcement of EIA approval decisions.

3. Incorporation of biodiversity considerations in strategic environmental assessments

34. The guidelines proposed for the integration of biodiversity in environmental impact assessment are also applicable to strategic environmental assessment, taking into account that for the latter type of assessment, biological diversity concerns should be considered from the early stages of the drafting process, including when developing new legislative and regulatory frameworks (decision V/18, paras. 1(c) and 2 (a)), and at the decision-making and/or environmental planning levels (decision V/18, para. 2 (a)), and that strategic environmental assessments by their nature cover policies and programmes, a wider range of activities over a wider area.

35. Strategic environmental assessment, while not a new process, is not practised as widely as environmental impact assessment. As experience accumulates in countries, it may then be necessary to draw more specific guidelines for the incorporation of biodiversity in the process.

4. Ways and means

(a) Capacity-building

36. Any activity aimed at the incorporation of biodiversity considerations into national environmental impact assessment systems should be accompanied by appropriate capacity development activities. Expertise in taxonomy, [6/] conservation biology, ecology, and traditional knowledge is required as well as local expertise in methodologies, techniques and procedures. Environmental impact assessments should involve ecologists with extensive knowledge on the relevant ecosystem(s) in the assessment team.

37. It is also recommended to develop training workshops on biodiversity and environmental impact/strategic environmental assessment for both assessment practitioners and biodiversity specialists to build a common understanding of the issues. School and university curricula should be reviewed to ensure that they incorporate material on biodiversity conservation, sustainable development and environmental impact/strategic environmental assessment.

38. Biodiversity relevant data should be organized in regularly updated and accessible databases, making use of rosters of biodiversity experts.

(b) Legislative authority

39. If environmental impact assessment and strategic environmental assessment procedures are incorporated into legislation, and the requirements for project/policy developers to find

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6/ See the Global Taxonomy Initiative and the proposed programme of work (decision V/9 of the Conference of the Parties and SBSTTA recommendation VI/6)

the most environmentally sound, efficient options that avoid, reduce or mitigate biodiversity and other adverse impacts are made explicit, this will prompt developers to, at a very early stage, use environmental impact assessment tools to improve the development process prior to the project consent stage or in some cases prior to screening procedures.

(c) Participation

40. Relevant stakeholders or their representatives, and in particular indigenous and local communities should be involved in the development of guidelines or recommendations for environmental impact assessments as well as throughout the assessment processes relevant to them, including decision-making.

Ramsar: Concerning stakeholder participation, including local communities and indigenous peoples, refer here to the Guidelines for establishing and strengthening local communities' and indigenous people's participation in the management of wetlands*, adopted under Resolution VII.8, and the* New Guidelines for management planning for Ramsar sites and other wetlands *(Resolution VIII.14).*

(d) Incentives

41. The possible link between impact assessment and incentive measures is pointed out in decision III/18 of the Conference of the Parties, on incentive measures. In paragraph 6 of that decision, the Conference of the Parties encouraged Parties to incorporate biological diversity considerations into impact assessments as a step in the design and implementation of incentive measures. The endorsement of the impact assessment process and its implementation within a legislative framework can act as an incentive, especially if applied at the policy level, to protect and, in certain cases even restore and rehabilitate biological diversity. [7/] Financial or other incentives can also be part of a negotiated approval package for a project.

(e) Cooperation

42. Regional collaboration is of particular importance, including for the development of criteria and indicators for the evaluation of impact and possibly criteria and indicators that can provide early warning of potential threats and adequately distinguish the effects of anthropogenic activities from natural processes, and the use of standardized methods of collection, assembly and exchange of information is needed to ensure regional compatibility and accessibility of data. Guidelines and sharing of information and experiences should be made available through *inter-alia*, the Convention's clearing-house mechanism.

43. As a follow-up to the implementation of decision IV/10 C of the Conference of the Parties, collaboration between this Convention and other biodiversity-related conventions, including in particular the Ramsar Convention and the Convention on Migratory Species, which have listed sites and binding agreements on certain species, and other relevant organizations and bodies will facilitate the development and implementation of any guidelines agreed upon for the integration of biodiversity-related issues in environmental impact assessment and strategic environmental assessment. Such a collaborative approach,

7/ UNEP/CBD/COP/4/20 and UNEP/CBD/SBSTTA/4/10.

also embodied in resolution VII.16 of the Conference of the Parties to the Ramsar Convention ("The Ramsar Convention and impact assessment: strategic, environmental and social"), could lead to the development of an umbrella set of guidelines on impact assessment for biodiversity-related conventions.

44. Web-based resources such as the clearing-house mechanism of the Convention on Biological Diversity may help to raise awareness about best available methods and useful sources of information and experience, and should be developed and used for the provision and exchange of information on environmental impact assessment.

45. Communication between practitioners of environmental impact assessment and scientists working in the biodiversity domain is in urgent need of improvement and should be enhanced through workshops, case-study assessments. [8/]

8/ See UNEP/CBD/COP/5/INF/34

Appendix 1

Questions pertinent to screening on biological diversity impacts

Level of diversity	*Biological diversity perspective*	
	Conservation of biological diversity (Non-use values)	*Sustainable use of biodiversity (Use values)*
Genetic diversity [(1)]	(I) Does the intended activity cause a local loss of varieties/cultivars/breeds of cultivated plants and / or domesticated animals and their relatives, genes or genomes of social, scientific and economic importance?	
Species diversity [(2)]	(II) Does the intended activity cause a direct or indirect loss of a population of a species?	(III) Does the intended activity affect the sustainable use of a population of a species?
Ecosystem diversity [(2)]	(IV) Does the intended activity lead to serious damage or total loss of (an) ecosystem(s) or land-use type(s), thus leading to a loss of ecosystem diversity (i.e. the loss of indirect use values and non-use values)?	(V) Does the intended activity affect the sustainable exploitation of (an) ecosystem(s) or land-use type(s) by humans in such manner that the exploitation becomes destructive or non-sustainable (i.e. the loss of direct use values)?

(1) The potential loss of natural genetic diversity (genetic erosion) is extremely difficult to determine, and does not provide any practical clues for formal screening. The issue probably only comes up when dealing with highly threatened, legally protected species which are limited in numbers and / or have highly separated populations (rhinoceros, tigers, whales, etc.), or when complete ecosystems become separated and the risk of genetic erosion applies to many species (the reason to construct so-called eco-ducts across major line infrastructure). These issues are dealt with at species or ecosystem level.

Ramsar: The Ramsar Convention does not currently directly address issues of genetic diversity.

(2) Species diversity: The level at which "population" is to be defined fully depends on the screening criteria used by a country. For example, in the process of obtaining a special status, the conservation status of species can be assessed within the boundaries of a country (for legal protection), or can be assessed globally (IUCN Red Lists). Similarly, the scale at which ecosystems are defined depends on the definition of criteria in a country.

Ramsar: As a reference for the definition of populations, for waterbirds appropriate biogeographical populations are established in Wetlands International's Waterbird Population Estimates *(3rd edition, 2002). Where a site under consideration regularly supports >1% of one or more waterbird populations, and additional question could be: does the intended activity threaten to cause direct or indirect loss of the international importance of waterbird populations?*

Appendix 2

The screening criteria

This is a suggested outline of a set of screening criteria, to be elaborated on country level. It only deals with biodiversity criteria and thus is an add-on to already existing screening criteria.

Category A: Environmental impact assessment mandatory:

Only in the case criteria can be based on formal legal backing, such as:

- National legislation, for example in case of impact on protected species and protected areas;
- International conventions such as CITES, the Convention on Biological Diversity, Ramsar Convention on Wetlands, etc.;
- Directives from supranational bodies, such as the European Union directive 92/43/EEC of 21 May 1992 on conservation of natural habitats and of wild fauna and flora and directive 79/409/EEC on the conservation of wild birds

Indicative list of activities for which an environmental impact assessment could be mandatory:

(a) **At the genetic level** (relates to screening question I in annex I above):

- Directly or indirectly cause a local loss of legally protected varieties/cultivars/breeds of cultivated plants and / or domesticated animals and their relatives, genes or genomes of social, scientific and economic importance e.g. by introducing living modified organisms that can transfer transgenes to legally protected varieties/cultivars/breeds of cultivated plants and / or domesticated animals and their relatives

(b) **At species level** (relates to screening question II and III in annex I above):

- Directly affect legally protected species, for example by extractive, polluting or other disturbing activities;
- Indirectly affect legally protected species, for example by reducing its habitat, altering its habitat in such a manner that its survival is threatened, introducing predators, competitors or parasites of protected species, alien species or GMOs;
- Directly or indirectly affect all of the above for cases which are important in respect of e.g. stop-over areas for migratory birds, breeding grounds of migratory fish, commercial trade in species protected by CITES.
- Directly or indirectly affect non-legally protected, threatened species.

(c) **At ecosystem level** (screening questions IV and V in annex I above):

- Are located in legally protected areas ;
- Are located in the vicinity of legally protected areas;
- Have direct influence on legally protected areas, for example by emissions into the

area, diversion of surface water that flows through the area, extraction of groundwater in a shared aquifer, disturbance by noise or lights, pollution through air.

Category B: The need for, or the level of environmental impact assessment, is to be determined:

In cases where there is no legal basis to require an environmental impact assessment, but one can suspect that the proposed activity may have a significant impact on biological diversity, or that a limited study is needed to solve uncertainties or design limited mitigation measures. This category covers the frequently referred to but difficult to use concept of "sensitive areas". As long as so-called sensitive areas do not have any legal protected status it is difficult to use the concept in practice, so a more practical alternative is provided.

The following categories of criteria point towards possible impacts on biological diversity, and further attention is thus required:

(a) **Activities in, or in the vicinity of, or with influence on areas with legal status having a probable link to biological diversity but not legally protecting biological diversity** (*relates to all five screening questions in annex I above*). For example: a Ramsar site has the official recognition of having internationally important wetland values, but this recognition does not automatically imply legal protection of biological diversity in these wetlands). Other examples include areas allocated to local and indigenous communities, extractive reserves, landscape preservation areas, sites covered by international treaties or conventions for preservation of natural and / or cultural heritage such as the UNESCO Biosphere reserves and World Heritage Sites;

(b) **Impacts on biological diversity possible or likely, but the environmental impact assessment is not necessarily triggered by law:**

(i) **At the genetic level:**

- Replacing agricultural, forestry or fishery varieties or breeds by new varieties, including the introduction of living modified organisms (LMOs) (*screening questions I and II*).

(ii) **At the species level:**

- All introductions of non-indigenous species (*questions II and III*);

- All activities which directly or indirectly affect sensitive or threatened species if or in case these species are not yet protected (good reference for threatened species is provided by the IUCN Red Lists); sensitive species may be endemic, umbrella species, species at the edge of their range, or with restricted distributions, rapidly declining species (*question II*). Particular attention should be given to species which are important in local livelihoods and cultures;

- All extractive activities related to the direct exploitation of species (fisheries, forestry, hunting, collecting of plants (including living botanical

and zoological resources), etc.) (*question III*)

- All activities leading to reproductive isolation of populations of species (such as line infrastructure) (*question II*)

(iii) **At the ecosystem level:**

- All extractive activities related to the use of resources on which biological diversity depends (exploitation of surface and groundwater, open pit mining of soil components such as clay, sand, gravel, etc.) (*questions IV and V*);

- All activities involving the clearing or flooding of land (*questions IV and V*);

- All activities leading to pollution of the environment (*questions IV and V*);

- Activities leading to the displacement of people (*questions IV and V*);

- All activities leading to reproductive isolation of ecosystems (*question IV*);

- All activities that significantly affect ecosystem functions that represent values for society (see annex III below for a list of functions provided by nature). Some of these functions depend on relatively neglected taxa;

- All activities in areas of known importance for biological diversity (*questions IV and V*), such as areas containing high diversity (hot spots), large numbers of endemic or threatened species, or wilderness; required by migratory species; of social, economic, cultural or scientific importance; or which are representative, unique (e.g. where rare or sensitive species occur) or associated with key evolutionary or other biological processes.

Category C: no environmental impact assessment required

Activities which are not covered by one of the categories A or B, or are designated as category C after initial environmental examination.

The generic nature of these guidelines does not allow for the positive identification of types of activities or areas where environmental impact assessment from a biodiversity perspective is not needed. At country level, however, it will be possible to indicate geographical areas where biological diversity considerations do not play a role of importance and, conversely, areas where they do play an important role (biodiversity-sensitive areas).

Appendix 3

Indicative list (non-exhaustive) of examples of functions of the natural environment that are directly (flora and fauna) or indirectly (services provided by ecosystems such as water supply) derived from biological diversity.

Production functions

Natural production

- Timber production
- Firewood production
- Production of harvestable grasses (construction & artisanal use)
- Naturally produced fodder & manure
- Harvestable peat
- Secondary (minor) products
- Harvestable bush meat (food)
- Fish & shellfish productivity
- Drinking water supply
- Supply of water for irrigation and industry
- Water supply for hydroelectricity
- Supply of surface water for other landscapes
- Supply of ground water for other landscapes

Nature-based human production

- Crop productivity
- Tree plantations productivity
- Managed forest productivity
- Rangeland /livestock productivity
- Aquaculture productivity (freshwater)
- Mariculture productivity (brackish/saltwater)

Carrying functions

- Suitability for constructions
- Suitability for indigenous settlement
- Suitability for rural settlement
- Suitability for urban settlement
- Suitability for industry
- Suitability for infrastructure
- Suitability for transport infrastructure
- Suitability for shipping / navigation
- Suitability for road transport
- Suitability for rail transport
- Suitability for air transport
- Suitability for power distribution
- Suitability for use of pipelines
- Suitability for leisure and tourism activities
- Suitability for nature conservation

Processing and regulation functions

Land-based processing and regulation functions

- Decomposition of organic material (land based)
- Natural desalinisation of soils
- Development / prevention of acid sulphate soils
- Biological control mechanisms
- Seasonal cleansing of soils
- Soil water storage capacity
- Coastal protection against floods
- Coastal stabilisation (against accretion / erosion)
- Soil protection

Water related processing and regulation functions

- Water filtering function
- Dilution of pollutants function
- Discharge of pollutants function
- Flushing / cleansing function
- Bio-chemical/physical purification of water
- Storage for pollutants function
- Flow regulation for flood control
- River base flow regulation
- Water storage capacity
- Ground water recharge capacity
- Regulation of water balance
- Sedimentation / retention capacity
- Protection against water erosion
- Protection against wave action
- Prevention of saline groundwater intrusion
- Prevention of saline surface-water intrusion
- Transmission of diseases

Air-related processing and regulation functions

- Filtering of air
- Carry off by air to other areas
- Photo-chemical air processing (smog)
- Wind breaks
- Transmission of diseases
- Carbon sequestration

Biodiversity-related regulation functions

- Maintenance of genetic, species and ecosystem composition
- Maintenance of horizontal and vertical spatial structure, and of temporal structure
- Maintenance of key processes for structuring or maintaining biological diversity
- Maintenance of pollinator services

- **Signification functions**
- Cultural/religious/scientific/landscape functions

Appendix 4

Biodiversity checklist on scoping for the identification of the impacts of proposed projects on components of biodiversity (Not exhaustive).

		COMPONENTS OF BIOLOGICAL DIVERSITY			
		Composition	*Structure (temporal)*	*Structure (spatial: horizontal and vertical)*	*Key processes*
LEVELS OF BIOLOGICAL DIVERSITY	Genetic diversity	Minimal viable population (avoid destruction by inbreeding / gene erosion) Local cultivars. Living modified organisms.	Cycles with high and low genetic diversity within a population.	Dispersal of natural genetic variability Dispersal of agricultural cultivars.	Exchange of genetic material between populations (gene flow) Mutagenic influences Intraspecific competition
	Species diversity	Species composition, genera, families etc, rarity / abundance, endemism / exotics Population size and trends Known key species (essential role) Conservation status	Seasonal, lunar, tidal, diurnal rhythms (migration, breeding, flowering, leaf development, etc.) Reproductive rate, fertility, mortality, growth rate. Reproductive strategy.	Minimal areas for species to survive. Essential areas (stepping stones) for migrating species. Niche requirements within ecosystem (substrate preference, layer within ecosystem) Relative or absolute isolation	Regulation mechanisms such as predation, herbivory, parasitism,. Interactions between species. Ecological function of a species
	Ecosystem diversity	Types and surface area of ecosystems Uniqueness / abundance Succession stage, existing disturbances and trends (=autonomous development)	Adaptations to / dependency *on* regular rhythms: seasonal Adaptations to / dependency of *on* irregular events: droughts, floods, frost, fire, wind Succession (rate)	Spatial relations between landscape elements (local and remote) Spatial distribution (continuous or discontinuous / patchy); Minimal area for ecosystem to survive. Vertical structure (layered, horizonts, stratified).	Structuring process(es) of key importance for the maintenance of the ecosystem itself or for other ecosystems.

Appendix 3: Table of Activities/threats Potentially Affecting Classes of Migratory Species

Activity / Threat Requiring Impact Assessment	Category of Migratory Species Potentially Affected
Construction of aerial barriers (fence lines, power lines, wind farms etc)	Birds (migratory water-birds, albatrosses and petrels)
Construction of (freshwater and estuarine) barriers (dams)	Freshwater fish
Terrestrial habitat destruction/fragmentation (including wetlands, grasslands, forests, mangroves)	Birds (migratory water-birds, albatrosses and petrels) Terrestrial mammals (bats, ground dwelling migratory mammals)
Aquatic habitat destruction/fragmentation (including aquaculture)	Marine mammals (cetaceans, seals and sea lions) Marine fish Freshwater fish Marine reptiles (marine turtles).
Unsustainable aquatic hunting practices (including by-catch incidence)	Birds (migratory water-birds, albatrosses and petrels) Marine mammals (cetaceans, seals and sea lions) Marine reptiles (marine turtles).
Off-shore resource exploration (including seismic activities)	Marine mammals (cetaceans, seals and sea lions) Marine fish Marine reptiles (marine turtles).
Terrestrial resource exploitation (including geophysical surveys and exploratory drilling)	Birds (migratory water-birds, albatrosses and petrels) Terrestrial mammals (bats, ground dwelling migratory mammals)
Introduction of alien /non – native invasive species	Birds (migratory water-birds, albatrosses and petrels) Terrestrial mammals (bats, ground dwelling migratory mammals) Marine mammals (cetaceans, seals and sea lions) Freshwater fish Marine fish Marine reptiles
Climate change.	Birds (migratory water-birds, albatrosses and petrels) Marine mammals (cetaceans, seals and sea lions) Terrestrial mammals (bats, ground dwelling migratory mammals) Marine fish Marine reptiles (marine turtles). Freshwater fish
Introduction of agricultural and industrial pollutants/chemicals (including run-off)	Birds (migratory water-birds, albatrosses and petrels) Terrestrial mammals (bats, ground dwelling migratory mammals) Marine mammals Marine fish Freshwater fish Marine reptiles