CONVENTION ON WETLANDS (Ramsar, Iran, 1971)
31st Meeting of the Standing Committee
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Agenda item 8.10

Ecological "outcome-oriented" indicators for assessing the implementation effectiveness of the Ramsar Convention

Action requested: The Standing Committee is requested to consider the progress achieved by STRP's Working Group 6 and invited to endorse the proposed approach and list of indicators, as well as to approve a process for the finalisation of this work for consideration by COP9 as an Annex to COP9 DR1 "Additional scientific and technical guidance for implementing the Ramsar wise use concept".

Note by STRP Working Group 6 and the Ramsar Secretariat

1. Paragraph 19 of COP8 Resolution VIII.26 requested the Scientific and Technical Review Panel (STRP) to:

> "prepare a series of key indicators in relation to the effective implementation of the Strategic Plan in the next triennium, to be used as part of the National Report Format. These indicators should be adopted by the Standing Committee at its annual meeting in 2004, so that Parties may use them to complement their National Reports when they are finalised in preparation for COP9 in 2005".

2. The STRP established its Working Group 6, co-led by David Pritchard (BirdLife International) and Teresita Borges (Cuba) to undertake this work, which was identified by the Standing Committee as a priority for the 2003-2005 triennium.

3. It should be recognised that the task has proved to be a particularly challenging one for the STRP and its Working Group, and it has not been possible to progress this work as rapidly as was anticipated by Resolution VIII.26.

4. The particular challenge faced by the Working Group has been to identify indicators which go beyond just the assessment of status and trends (such as is being done by the Convention on Biological Diversity (CBD) to assess achievement of the 2010 biodiversity target) and which could be formulated in such a way as to yield insights into the Convention's effectiveness, in conjunction with analysis of certain 'process-oriented indicators' such as those in the COP9 National Report Format.

5. Nevertheless the Working Group has made significant progress in preparing the rationale and basis for such indicators, has identified a set of seven indicators for immediate implementation and others which could be developed subsequently, and is currently, with the assistance of consultant Val Kapos of UNEP-WCMC, preparing indicator 'factsheets' for this first tranche of indicators using a standard template.

6. For a number of the indicators it will be appropriate to collect and analyse information as a set of more than one 'sub-indicator' on the indicator topic. For some indicators, a first sub-indicator has been identified which can be applied now, with other sub-indicators being identified for subsequent development.

7. In undertaking its work, the STRP and the Secretariat have worked closely with, and contributed to, the CBD work in developing indicators to assess the achievement of the 2010 biodiversity target, and they have drawn upon this work in order to harmonise and link with the CBD indicators as much as possible.

8. It should be noted that for some of the proposed effectiveness indicators, global datasets are available from which to form the basis of assessments, but for other indicators there will be a need for Contracting Parties and other Convention mechanisms such as STRP National Focal Points to assist with data collection at site and national levels.

9. The Working Group has also prepared some test analyses of certain of the indicators so as to test how assessment of the effectiveness indicators might be best presented.

10. The STRP and its Working Group 6 have concluded that it is clear that even with considerable input of voluntary time on the part of STRP members and others, only a very restricted basis for feasible measurement and assessment of Ramsar effectiveness is available at the present time. They consider that this is partly a function of the complexity of some of the issues involved – genuinely getting to the heart of the effectiveness question is a challenging matter. But it is also a function of the limited existence of usable datasets on which to base relevant measures. Key amongst these are data which fall to Parties to provide through, for example, Ramsar Information Sheets and their updates and National Reports. The work on effectiveness indicators so far delivers a clear message that for the Convention to have an adequate story to tell about its effectiveness (and the cost-effectiveness of the investment made in it by its Parties and others), much more efficient and complete information management and systematic information provision by all, particularly at national level, will be required.

11. The STRP and its Working Group 6 have also recognised that there will a need to establish a process and mechanism for the data collection, compilation, analysis and preparation of assessments for each effectiveness indicator, and for reporting timeframes.

12. This document is presented to the 31st meeting of the Standing Committee for consideration in the form of:

    i) a draft Annex to COP9 DR1 which provides the list of proposed indicators for immediate implementation and subsequent development, and draft factsheets for the first tranche of proposed indicators; and

    ii) a draft COP9 Information Paper prepared by STRP Working Group 6 which sets out the rationale, approach and issues identified in the development and implementation of such 'indicators of Convention effectiveness'.

13. The Standing Committee may wish to consider the following:

i) approving the list of first tranche indicators and those to be subsequently developed, for consideration by COP9;

ii) requesting STRP and its Working Group 6, with the assistance of the Secretariat, to complete factsheet preparation for the first tranche of indicators and to circulate these to the Standing Committee for its approval for their inclusion in COP9 DR1 – Annex E;

iii) discussing a process for developing and agreeing the mechanism for applying, analysing and reporting assessment of the indicators of effectiveness;

iv) requesting the STRP and Secretariat to develop further the draft Information Paper for provision to Parties at COP9 and to include the test demonstration analyses for the first tranche of indicators.

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COP9 DR1 – Annex E

Ecological "outcome-oriented" indicators for assessing the implementation effectiveness of the Ramsar Convention

1. The following seven indicators of the effectiveness of the implementation of the Convention are available for implementation during the 2006-2008 triennium:

Indicator theme	Indicator title
Wetland resource - status	A. The overall conservation status of wetlands
Ramsar sites – status	B. The status of the ecological character of Ramsar sites
Water resources - status	C. Water-related indicator(s)
Ramsar sites – threats	D. The frequency of threats affecting Ramsar sites
Wetland management	E. Wetland sites with successfully implemented conservation or wise use management plans
Species/populations status	F. Overall population trends of wetland taxa
Threatened Species	G. Changes in threat status of wetland taxa
Ramsar Site designation progress	H. The proportion of candidate Ramsar sites designated so far

2. Factsheets providing guidance for the application of each of these indicators are provided below. For most indicators an initial sub-indicator or sub-indicators are provided which can be implemented from existing data and information sources. The factsheets identify additional sub-indicators which have the potential for future development.

3. The following four indicators are recommended for further consideration and future development by the STRP:

Indicator theme	Indicator title
Ramsar sites – designation progress	I. Coverage of wetland–dependent bird populations by Ramsar sites
Wetland services	J. The economic costs of unwanted floods and droughts
Legislative & policy responses	K. Legislative amendments implemented to reflect Ramsar provisions
Legislative & policy responses	L. Wise use policy

[Note to the 31st meeting of the Standing Committee: the draft factsheets provided below will undergo further review and development for finalisation by STRP's Working Group 6, with the advice of the Standing Committee.]

Indicator A. The overall conservation status of wetlands

Two sub-indicators have been developed for application:

- Status and trends in ecosystem extent
- Trends in conservation status – qualitative assessment

Indicator theme	**Wetland resource - status**
Indicator Code	**A**
Indicator title	**The overall conservation status of wetlands**
Sub-indicator	**Status and trends in ecosystem extent**
Purpose *(summary for decision-makers of what the indicator shows including relation to Convention effectiveness (hypotheses) and assumptions about surrogacy)*	The indicator shows how the area of particular wetland types has changed through time. Because the Ramsar Convention aims to 'stem the progressive encroachment on and loss of wetlands', its effective implementation should have reduced the loss of wetland area. Strictly, this should be assessed relative what would have happened without the Convention, both since convention implementation and through time. Thus, maintenance or expansion of ecosystem area indicate that ecosystem loss has been stemmed. Although the area of a particular wetland type may have declined, the Convention's impact could be seen in a rate of loss that is lower than previously or than projected, or in areas not affected by the Convention. Increasing rates of loss of ecosystem area imply that the Convention is not effective. For some wetland ecosystem types, area reflects both the persistence of the ecosystem and its viability as habitat for wetland species. However, not all wetland types can appropriately be assessed in area terms. Some are relatively little subject to area change *per se* (e.g. rivers) and many present technical challenges in the detection of area change. It will also be necessary screen out wetland types (e.g. manmade types) whose increase may be at expense of natural ones or be undesirable for other reasons.
Relationship to other Ramsar indicators, and to any sub-indicators	Area and its maintenance are only one aspect of the conservation status of even those wetlands for which area assessment is appropriate. The pressures on these ecosystems and the measures in place to reduce them are other key components.

	Species-based indicators (F & G) can provide information on changes in ecosystem condition and are particularly useful for ecosystems not subject to area assessment. For some ecosystems indicators on water quality provide a useful complement. The baseline information on different wetland types compiled for this sub-indicator are also relevant to the analysis of indicator H (The proportion of candidate Ramsar sites designated so far).
Relevance to 2010 targets and other indicator processes	Ecosystem extent is one of the global indicators of progress towards the 2010 biodiversity target identified by the CBD.
Broad types of data required	*Quantitative data on ecosystem extent.* These are most likely to be derived from mapped data, especially from remote sensing or aerial photography. Combining remotely sensed data with other data sources, e.g. on topography, hydrology and climate, and seasonality, can increase their usefulness for assessing the extent of specific wetland types. The indicator will only be truly useful for assessment of effectiveness of the Convention if several re-assessments are (or become) available so that rates of change can be calculated. *Qualitative or semi-quantitative assessments of change in ecosystem area.* If generated in a consistent manner, these can potentially be weighted by ecosystem area to provide an index of area change. If the above datasets are not available, a cruder level of information still could be acquired by documenting instances of loss - e.g. every time a planning regime sanctions another instance of afforestation, infilling, drainage etc of a wetland. The Ramsar wetland types for which these data types are most relevant include the following (those indicated with an * have been identified within the CBD's 2010 indicator as having current availability of relevant datasets): *Coral reefs Intertidal marshes *Interidal forested wetlands (Mangroves) Permanent inland deltas Permanent and seasonal marshes, both fresh and saline *Non-forested peatlands Alpine wetlands Tundra wetlands Shrub-dominated wetlands Freshwater, tree-dominated wetlands *Forested Peatlands

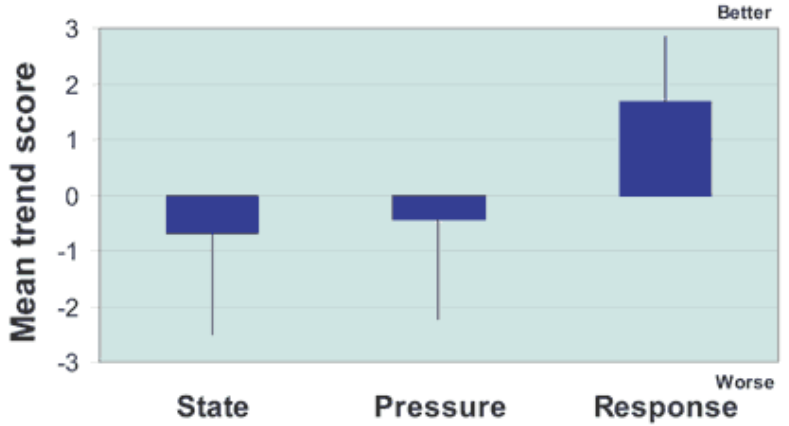
	However, area changes are more difficult to detect in some of these wetland types than in others. Wetland types not listed are either unlikely to change in area over the time frames normally measured or present severe difficulties for quantifying area and/or detecting area changes, including those which are "lost" when they change qualitatively into a different wetland type, while remaining wetland.
Role of Contracting Parties, including relationship of indicator to Ramsar National Reports process	National landcover and resource assessments potentially provide relevant data for this indicator, and CPs should both harness such relevant data for their own purposes and ensure that it is available and contributes to regional and global assessments. In addition, the COP9 National Report Format includes fields for national information on extent and status of coastal wetlands and peatlands.
Scale(s) - *Global, regional, national, sub-national/site or combination of these*	Global, regional, national and sub-national assessments are all appropriate for some ecosystem types
Periodicity and timing, of (a) data-collation and analysis (b) presentation of results	In order to assess Convention effectiveness, it is necessary to have at least three assessments of ecosystem area or two evaluations of the rate of area change. Realistic time scales for reassessment are likely to be periods of 5-10 years for change detection.
Baseline	Most likely baseline is 1995-2000 for remote sensing-based data sources. Some national and regional data sets may have earlier and even historical baselines (e.g. Dahl 1990, 2000).
Data sources *(following Res VIII.6 standard record for meta-inventory) and acquisition (including accessibility and costs)*	Global data sources include: FAO Forest Resources Assessment: statistical data for mangroves, tropical peat swamp forests, Freshwater, tree-dominated wetlands MODIS landcover project: mapped data for the same Reef check Lehner & Döll 2004 Regional sources include: Europe: Corine Landcover assessement: 2000, 2004 North America: Dahl 1990, 2000 Caribbean Reefs: Gardner et al. 2003

	National landcover and resource assessments.
Data custodians and coordinators *(following Res VIII.6 standard record for meta-inventory)*	Dependent on which wetland types are being assessed [to be added]
Data collators and analysts	Dependent on which wetland types are being assessed [to be added]
Type of statistics generated and units	Total current area of the ecosystem type - km^2 or ha Change in area of the ecosystem type per time period km^2 or ha per year For analysis and presentation it is likely to be appropriate to generate statistics for different regions or sub-regions, and to include country-scale assessments where datasets have patchy geographical coverage. It is vital that these statistics be presented in absolute terms alongside any presentation of percentage losses.
Presentation of results *(described in summary here, and if possible illustrated by some worked examples, eg of graphics, in an annex to the factsheet)*	Results can usefully be presented as maps or as graphs (and statistics). The former have visual impact, the latter provide a more straightforward quantitative view. Sets of maps would at minimum show distribution of the ecosystem type at different points in time, or a single map would show locations of ecosystem area change. Flood-filled maps of change magnitude can also be useful. Ideally a graph would show wetland ecosystem area for three or more points in time. More meaningfully still, in relation to Convention effectiveness it would show the average rate of change of wetland ecosystem area for at least two time periods.
Limitations, and assumptions *caveats to interpretation and minimum requirements for validity*	[to be added]
Action steps required for development and implementation of the indicator	[to be added]
Costs and sources of support	[to be added]
Future possible enhancements of the indicator and/or its use	[to be added]

Indicator theme	**Wetland resource - status**
Indicator Code	**A**
Indicator title	**The overall conservation status of wetlands**
Sub-indicator	**Trends in conservation status – qualitative assessment**
Purpose *(summary for decision-makers of what the indicator shows including relation to Convention effectiveness (hypotheses) and assumptions about surrogacy)*	The indicator shows how the conservation status of wetlands at large is changing. Conservation status is a combination of the state of the ecosystem, the pressures acting on it and the responses or actions that reduce or mitigate the effects of those pressures. This indicator is therefore not merely about "intactness of ecological character". Trends in conservation status can be determined by assessing trends in each of these components qualitatively. Effective implementation of the Ramsar Convention should mean that the overall conservation status of wetlands at large is improving through time; that is, their state is improving, the actual pressures on them are being reduced and response measures in place are improving. The reasons for broad patterns of improvement or decline would need to be investigated through more detailed analysis in relation to particular aspects of the Convention and components of the indicator.
Relationship to other Ramsar indicators, and to any sub-indicators	Where they exist, quantitative indicators such as trends in ecosystem extent, in species populations and in water quality contribute to the assessment of conservation status. The assessment process is also analogous to a scoring system that would evaluate the maintenance of ecological character in Ramsar sites and as such provides an additional perspective on the role of site designation as a mechanism to improve conservation status. In respect specifically of Ramsar sites, the data collected under indicator E will follow the same approach, and taken together th two indicators may be used to assess the relative trends in conservation status of designated sites and other wetlands. Likewise data collected under indicator D will also be relevant to the assessment of this indicator.
Relevance to 2010 targets and other indicator processes	Improving conservation status should in theory be related to declining loss in biodiversity, but this approach has not yet emerged within the discussions of monitoring progress towards the 2010 target or in other indicator processes. Furthermore, since the 2010 target is a measure of absolute outcome, it will not directly address the pressure and response parts of conservation status assessment.
Broad types of data required	Qualitative assessments of trends in pressures, states and response measures on a site-by-site basis according to clearly developed criteria and guidelines accompanied by a simple scoring system. Such a system might include categories for stable, improving (slightly or strongly) and declining (slightly or strongly). The factors assessed would include broad

	concepts such as ecosystem health or habitat quality and more specific parameters such as agricultural encroachment, effect of alien invasive species and enforcement actions. The use of qualitative assessment means that wetlands can be assessed by experts with appropriate local knowledge even in the absence of quantitative data on the parameters that make up the index.
Role of Contracting Parties, including relationship of indicator to Ramsar National Reports process	CPs should contribute to the development of criteria and guidelines, identify appropriate experts to participate in wetland assessments, and implement assessments of national wetland resources using this approach. There is also a need to have in place a wetland inventory or at least an inventory of wetlands which will be assessed fro this indicator. There are also links with specific National Report Format fields and to the information provided in the "conservation status" field of RISs when they are updated are updated.
Scale(s) - *Global, regional, national, sub-national/site or combination of these*	On the whole, this approach may be best suited to initial application of data acquisition at sub-national and national scales. Portions of assessments done at these scales could be aggregated to provide regional, and in some cases global overviews. The assessments will be more robust and convincing if they are based on as nearly site-scale assessment as possible.
Periodicity and timing, of (a) data-collation and analysis (b) presentation of results	There is some question about how robust this approach is through repeated reassessments, how sensitive it is to different magnitudes of real change, and how this relates to the intervals between assessments and changes in the experts involved. A four or five year assessment and analysis cycle might optimise both robustness and sensitivity, as well as providing a policy-relevant perspective.
Baseline	Application of criteria and scoring would need to be relative to some fixed baseline in the recent past to which evaluators are able to refer, at least in qualitative terms. A reasonable baseline in many cases will be 2000 or the year of the most recent wetland assessment. Potentially, baselines could be set at a Convention-related milestone, such as national ratification or initiation of a regional process. This would provide the greatest potential for demonstrating convention effectiveness. However, there is a danger that qualitative trends assessed over very long periods might become less credible. It might be possible for initial application of the approach to cover both a standard recent shorter time period (see above) and change since a more distant baseline (as has been successfully done for a recent assessment of the status of Mediterranean wetlands (Stark, Davidson & Kouvelis 2004).
Data sources *(following Res VIII.6*	Important Bird Area monitoring programmes have already provided pilot application of this approach (see

standard record for meta-inventory) and acquisition (including accessibility and costs)	http://www.birdlife.org/action/science/indicators/iba_indices.html), and these will continue to develop and deliver data regularly over the course of the next few years. A similar approach was piloted in 2004 as part of the MedWet assessment process, using a standard qualitative assessment questionnaire, which could be developed for global application. Harmonisation among these approaches and applying the resulting method to wetlands that are not IBAs will require a separate process and data management. These could be national or regional assessment initiatives, which also contribute to a centrally-managed database forming the basis ofr assessment analyses.
Data custodians and coordinators *(following Res VIII.6 standard record for meta-inventory)*	Birdlife International coordinates IBA monitoring, and its national partner organisations are the primary custodians of the data. Other appropriate custodians will need to be identified as the process develops.
Data collators and analysts	[to be added]
Type of statistics generated and units	Average trend scores among wetland sites for component factors and (potentially) for pressure, state and response measures over all. Numbers and areas of wetland sites with improving and declining components of conservation status.
Analysis and presentation of results *(described in summary here, and if possible illustrated by some worked examples, eg of graphics, in an annex to the factsheet)*	Once the scoring system has been applied to a set of wetland sites, the results can be combined to give a picture of overall trends in terms of average pressure, state and response scores across the sites (see example below for Kenya's IBAs). If the Convention is fully effective, then the average trend scores should be positive, or at least zero. Alternatively, the average should be increasing through time.



Summary of trends in Kenya's IBAs 1999-2003 (n=49) (from Otieno et al. 2004. *Kenya's Important Bird Areas Status and Trends 2004*. Nature Kenya, Nairobi; http://www.birdlife.org/action/science/indicators/iba_indices.html)

Alternatively, trends can be expressed in terms of proportion of sites with improving or declining status with respect to each criterion.

An added use and presentation of such a system is in the analysis of the components of the scorecard to determine the prevalence of trends in particular factors affecting the conservation status of wetlands (e.g. agricultural encroachment) – see Stark, Davidson & Kouvelis 2004 for an example. These can in turn be analysed in relation to different components of convention implementation, with links here to information from indicator D.

Analysis can also be carried out by wetland type.

Limitations, and assumptions *caveats to interpretation and minimum requirements for validity*	There are potential problems associated with equivalencies in aggregating data and interpreting aggregated indices. There are questions about how an improvement in a badly degraded site should be weighted relative to an equivalent improvement in conservation status in a site whose conservation status was relatively good to begin with. It is also unclear as yet how sensitive this approach will be in detecting changes in trends over time, or what is the effect of changing expert assessors, and/or indeed supplying assessors (changed or consistent) with information about

	previous assessments.
Action steps required for development and implementation of the indicator	Criteria and guidance for the scoring system need to be developed based on the previously existing efforts and further consultation about weightings and factors.
Costs and sources of support	[to be added]
Future possible enhancements of the indicator and/or its use	[to be added]

Indicator B. The status of the ecological character of Ramsar sites

[under development – a qualitative approach as for indicator A above will provide a first sub-indicator]

Indicator C. Water-related indicator(s)

Two sub-indicators have been developed for application:

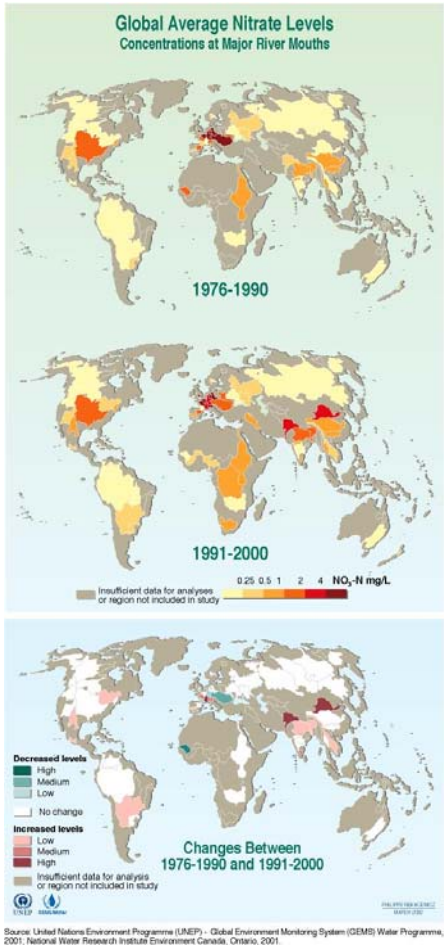
- Trends in dissolved nitrate (or nitrogen) concentration; and
- Trends in Biological Oxygen Demand (BOD)

Indicator theme	**Water-related Indicator**
Indicator Code	**C**
Indicator title	**Trends in Water Quality**
Sub-indicator	**Trends in dissolved nitrate (or nitrogen) concentration**
Purpose *(summary for decision-makers of what the indicator shows including relation to convention effectiveness (hypotheses) and assumptions about surrogacy)*	The indicator shows how levels of nitrogen in inland waters are changing over time, and reflects both pollution and trophic changes in the ecosystem. The principal contributor to dissolved nitrogen concentration is nitrate from fertiliser run off and other sources of pollution. It is a standard component of water quality monitoring.

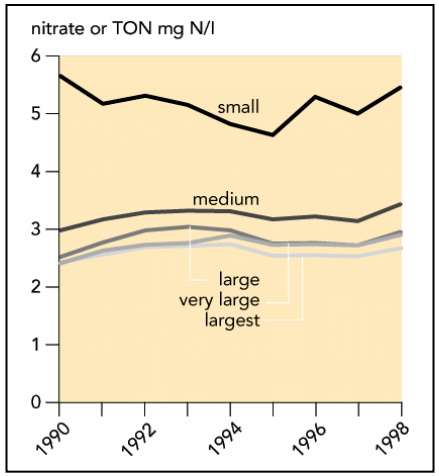
	While absolute levels of dissolved nitrogen vary with water body type and (to a lesser degree) seasonal conditions, increasing average nitrogen concentration in a given water body shows increasing nitrogen inputs. These are most likely to come from run off or other source of pollution (or, in the case of remote locations, airborne pollutants deposited in rainfall). At site level, trends in dissolved nitrogen concentration are a component of site status and a reflection of how well a site's immediate catchment and the wider basin are managed for the health of the ecosystem. The connection with Convention effectiveness is clear for Ramsar-designated sites – if designation has been effective in promoting their conservation and wise use, then a high proportion of Ramsar sites should have either stable or declining nitrogen concentrations. For other sites and for aggregate measures, the connection is with the health of freshwater ecosystems generally. In some cases this measure could be related to the role of Ramsar sites by expressing the nitrogen trend in relation to the numbers and areas of Ramsar designated sites within the basins for which the trends are measured.
Relationship to other Ramsar indicators, and to any sub-indicators	This sub-indicator is complemented by sub-indicators on trends in Biological Oxygen Demand (BOD), as well as potential sub-indicators on trends in suspended sediments and persistent organic pollutants. It informs indicators A and B in its role as a component of ecosystem health or ecological character. It is also closely related to indicator D (threats to wetlands) by its close relation to water pollution, land cover change and land management practises within catchments and basins.
Relevance to 2010 targets and other indicator processes	Water quality in aquatic ecosystems is one of the indicators identified by the CBD for monitoring progress towards the 2010 target. Nitrate concentration is one component of the CBD's indicator. Total nitrogen concentration (of which the vast majority is from nitrate and only a tiny fraction from nitrite) is an important indicator in the World Water Development Report process and for GEMS. The European Environment Agency uses trends in nitrate concentrations in rivers of different sizes as a key water indicator. The indicator makes a clear link between terrestrial and aquatic systems and to delivery of fresh water as an ecosystem service.
Broad types of data required	Time series of standardised measures of nitrate (or nitrogen) concentration from fixed monitoring stations. The location of the stations in relation to the catchment geography, downstream and upstream Ramsar sites should be fully specified. The data need to be quality controlled and to take account of seasonal patterns of variation. They should to be interpreted in the context of the presence and extent of Ramsar sites within the basin and of the rates of human population increase and/or urbanisation within the basin. Process-related data in addition to site designation will include implementation of sectoral policies and measures taken to achieve water quality targets.
Role of Contracting Parties,	Many of the relevant data are collected by national monitoring programmes. CPs will need to maintain and/or enhance

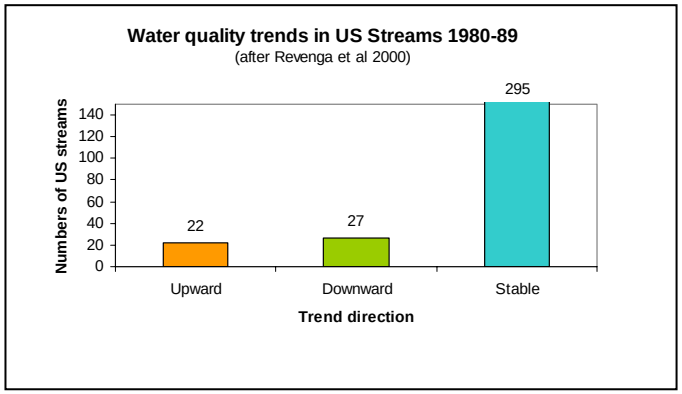
including relationship of indicator to Ramsar National Reports process	water quality monitoring programmes and to mobilise the resulting data and metadata
Scale(s) - *Global, regional, national, sub-national/site or combination of these*	Although much monitoring is done at the site scale, the indicator is of most interest at scales that take account of wider influences. Thus, its site scale application should, where possible, be associated with measurements from the wider basin. The indicator can meaningfully be aggregated at national, regional and global scales by presenting summary information on trends at many sites.
Periodicity and timing, of (a) data-collation and analysis (b) presentation of results	Trends should be expressed over five or ten year intervals and should therefore be re-assessed and re-presented with this frequency.
Baseline	For at least some major water bodies, baseline BOD data were established in the mid-1970s and therefore baseline trend data can beestablished for the period between then and 1990.
Data sources ***(following Resolution VIII.6 standard record for meta-inventory)*** and acquisition ***(including accessibility and costs)***	Data area available from the UNEP GEMS Water Programme, which regularly receives data from participating countries, and provides data quality assessment. At the national level, the data sources include national water authorities, water supply utilities, ministries of health or environment, and research institutions; many are not fully linked to GEMS as yet. Regional assessments such as the Arctic Monitoring and Assessment Programme and EUROWATERNET can also provide useful data.
Data custodians and coordinators *(following Resolution VIII.6 standard record for meta-inventory)*	UNEP GEMS Water Programme, European Environment Agency and other regional programmes, National water authorities.
Data collators and analysts	[provisionally] UNEP-GEMS Water, WWDR, European Environment Agency
Type of statistics generated and units	**Numbers** of water bodies with declining, stable and increasing average nitrate (or nitrogen) concentrations (measured in mg/L), relative to human population density and/or urbanisation and number and area of Ramsar sites in the Basin. A further possibility is to use geometric means (in a process analogous to species population trend indexing) to average the trends in individual water bodies thus giving an overall average trend with both a direction and magnitude (this is distinct from a trend in average concentrations)
Presentation of results: *(described in summary here, and if possible illustrated by some worked examples, eg of graphics, in an annex to the factsheet)*	It is possible to examine average nitrogen concentration across a wide range of water bodies at different time periods, and this will show broad patterns of change over time. For example, the EEA has produced the following analysis of regional average nitrogen concentrations in rivers of different sizes.

However, because datasets are not always consistent in their coverage over time, it may be more meaningful to analyse trends on a per-water-body basis. These can then be summarised as numbers of trends of particular directions (and magnitudes) or as an index



Source: United Nations Environment Programme (UNEP) - Global Environment Monitoring System (GEMS) Water Programme, 2001; National Water Research Institute Environment Canada, Ontario, 2001.

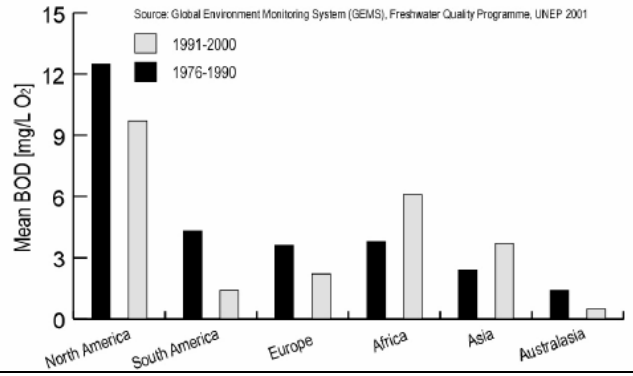




	of average trends (as opposed to trends in averages). Presentation needs to be in relation to measures of Ramsar implementation (e.g. number and area of sites upstream, time since Convention ratification, degree of national sectoral policy development, other process - measures of convention implementation).
Limitations, and assumptions *(caveats to interpretation and minimum requirements for validity)*	Although methods of measuring nitrate or nitrogen concentration are accepted and standardised, monitoring is unevenly distributed and patchy in time and space. Therefore care needs to be taken that trends reported are representative of real trends rather than seasonal variation or anomalies in the data set. Interpreting trends at site level needs to be done in relation to both site management and land management in the wider basin.
Action steps required for development and implementation of the indicator	• Development of guidance on appropriate temporal and spatial aggregation of water quality data. • Mobilisation of data from the water supply sector and linkage to data on population density, urbanisation and Ramsar site distribution.
Costs and sources of support	[not available]
Future possible enhancements of the indicator and/or its use	• Development of additional sub-indicators, including trends in suspended sediments, and occurrence of persistent organic pollutants (POPs) in surface water through the reporting mechanisms under the Stockholm Convention, which will begin working in 2006.

Indicator theme	**Water-related Indicator**
Indicator Code	**C**
Indicator title	**Trends in Water Quality**
Sub-indicator	**Trends in Biological Oxygen Demand (BOD)**
Purpose *(summary for decision-makers of what the indicator shows including relation to convention effectiveness (hypotheses) and assumptions about surrogacy)*	The indicator shows how levels of organic pollution in inland waters are changing over time. Biological Oxygen Demand is the amount of oxygen required by aerobic micro-organisms to decompose the organic matter in a sample of water, such as that polluted by sewage. It is a standard component of water quality monitoring.

	While absolute levels of BOD vary with water body type and (to a lesser degree) seasonal conditions, increasing average BOD in a given water body shows that there is an increase in organic matter inputs, which are most likely to come from effluent, run off or other source of pollution. At site level, trends in BOD are a component of site status and a reflection of how well a site's immediate catchment and the wider basin are managed for the health of the ecosystem. The connection with Convention effectiveness is clear for Ramsar-designated sites – if designation has been effective in promoting their conservation and wise use, then a high proportion of Ramsar sites should have trends in BOD that are either stable or declining over time. For other sites and for aggregate measures, the connection is with the health of freshwater ecosystems generally. In some cases this measure could be related to the role of Ramsar sites by expressing the BOD trend in relation to the numbers and areas of Ramsar designated sites within the basins for which BOD trends are measured.
Relationship to other Ramsar indicators, and to any sub-indicators	This sub-indicator is complemented by the sub-indicator on trends in nitrogen concentration and, as well as a potential sub-indicators on trends in suspended sediments and persistent organic pollutants. It informs indicators A and B in its role as a component of ecosystem health or ecological character. It is also closely related to indicator D (threats to wetlands) by its close relation to water pollution and catchment land cover change.
Relevance to 2010 targets and other indicator processes	Water quality in aquatic ecosystems is one of the indicators identified by the CBD for monitoring progress towards the 2010 target. BOD is one component of the CBD's indicator. BOD is an indicator of water quality in the UN CSD Thematic Indicator Framework. It is also an important indicator in the World Water Development Report process and for GEMS. The European Environment Agency uses BOD as a regional indicator in the form of % of stations with BOD in a given range. An indicator based on BOD makes a key link to delivery of fresh water as an ecosystem service.
Broad types of data required	Time series of standardised measures of BOD from fixed monitoring stations. The data need to be quality controlled and to take account of seasonal patterns of variation. They need to be interpreted in the context of the presence and extent of Ramsar sites within the basin and of the rates of human population increase and/or urbanisation within the basin. Process-related data in addition to site designation will include implementation of sectoral policies and measures taken to achieve water quality targets.
Role of Contracting Parties, including relationship of indicator to Ramsar National Reports process	Many of the relevant data are collected by national monitoring programmes. CPs will need to maintain and/or enhance water quality monitoring programmes and to mobilise the attendant data and metadata
Scale(s) - *Global, regional, national, sub-national/site or combination of these*	Although much monitoring is done at the site scale, the indicator is of most interest at scales that take account of wider influences. Thus, its site scale application should, where possible, be associated with measurements from the wider basin. The indicator can meaningfully be aggregated at national, regional and global scales by presenting summary information on trends at many sites.

Periodicity and timing, of (a) data-collation and analysis (b) presentation of results	Trends should be expressed over five or ten year intervals and should therefore be re-assessed and re-presented with this frequency.
Baseline	For at least some major water bodies, baseline BOD data were established in the mid-1970s and therefore baseline trend data can beestablished for the period between then and 1990.
Data sources *(following Resolution VIII.6 standard record for meta-inventory)* **and acquisition** *(including accessibility and costs)*	Data area available from the UNEP GEMS Water Programme, which regularly receives data from participating countries, and provides data quality assessment. At the national level, the data sources include national water authorities, water supply utilities, ministries of health or environment, and research institutions; many are not fully linked to GEMS as yet. Regional assessments such as the Arctic Monitoring and Assessment Programme can also provide useful data.
Data custodians and coordinators *(following Resolution VIII.6 standard record for meta-inventory)*	UNEP GEMS Water Programme, National water authorities.
Data collators and analysts	[provisionally: UNEP-GEMS Water, WWDR]
Type of statistics generated and units	Numbers of water bodies with declining, stable and increasing average BOD (mg O_2/L), relative to human population density and/or urbanisation and number and area of Ramsar sites in the Basin.
Presentation of results: *(described in summary here, and if possible illustrated by some worked examples, eg of graphics, in an annex to the factsheet)*	It is possible to examine average BOD across a wide range of water bodies at different time periods, and this will show broad patterns of change over time. For example, the CBD has produced the following analysis of regional average BOD in major water bodies (UNEP/CBD/SBSTTA/10/INF/19): 

	However, it is more meaningful to analyse trends on a per-water-body basis and present these relative to measures of Ramsar implementation (e.g. number and area of sites upstream, time since Convention ratification, degree of national sectoral policy development, other process - measures of Convention implementation).
Limitations, and assumptions *(caveats to interpretation and minimum requirements for validity)*	Although BOD measurement methods are accepted and standardised, monitoring is usually only in those water bodies most important for water supply or of most concern with respect to effluent and other sources of pollution. The data sets are often interrupted by changes in support for monitoring programmes and other factors. Therefore care needs to be taken that trends reported are representative of real trends rather than seasonal variation or anaomalies in the data set.
Action steps required for development and implementation of the indicator	• Development of guidance on appropriate temporal and spatial aggregation of water quality data. • Mobilisation of data from the water supply sector and linkage to data on population density, urbanisation and Ramsar site distribution.
Costs and sources of support	[not available]
Future possible enhancements of the indicator and/or its use	• Development of additional sub-indicators, including trends in suspended sediments, and occurrence of POPs in surface water through the reporting mechanisms under the Stockholm Convention, which will begin working in 2006

Indicator D. The frequency of threats affecting Ramsar sites

[under development]

Indicator E. Wetland sites with successfully implemented conservation or wise use management plans

[under development]

Indicator F. Overall population trends of wetland taxa

Indicator theme	**Species/biogeographic population status**
Indicator Code	**F**
Indicator title	**Overall population trends of wetland taxa**
Sub-indicator	**Status and trends of waterbird biogeographic populations**
Purpose *(summary for decision-makers of what the indicator shows including relation to convention effectiveness (hypotheses) and assumptions about surrogacy)*	Global and regional/flyway status and change in status of waterbirds as a key and well-known wetland-dependent taxon. Acts as a 'headline indicator' of high public profile. Indicates in which regions and seasons waterbirds are in relatively healthy and relatively unhealthy status, providing assistance in identification of priorities for resourcing and for policy and conservation management interventions. Waterbirds are widely regarded as useful indicators of wetland health, and migratory populations can be seen as integrators of ecosystem status along flyways (e.g. Piersma, T & Lindstrom, A. 2004. *Ibis* 146 (suppl. 1): 61-69); many populations aggregate during at least time of the year (either in breeding colonies; at migratory staging areas; and/or non-breeding feeding grounds – at these times they are likely to be responsive to site designation and protection and habitat management interventions.
Relationship to other Ramsar indicators, and to any sub-indicators	For this first tranche of indicators, this sub-indicator for waterbird populations is the only taxon addressed. Subsequent development may include sub-indicators for other wetland-dependent taxa. This indicator is closely related to Indicator G (Changes in threat status of wetland taxa), which reports at the species level. Indicator B (Status of the ecological character of Ramsar Sites) may provide a source for interpretation of results of this indicator.
Relevance to 2010 targets and other indicator processes	Provides probably the only global dataset other than for crops/domesticated animals which can present long-term trends relevant to CBD's genetic level of biodiversity. Also contributes to CBD's 2010 indicator on "Trends in abundance and distribution of selected species". For some parts of the world (notably Europe and North America) and taxa (notably ducks, geese, swans and waders) at least annual datasets, aggregated from site to national to international have been collected and compiled for over 40 years – providing amongst the longest-term trend context of any indicator, against which to compare recent trends and rates of change. For migratory waterbirds, this indicator is also relevant to indicators under development by the Convention on Migratory Species (CMS), and African-Eurasian Migratory Waterbird Agreement.

Broad types of data required	Process-related information needed for some aspects of assessment analysis: - number and area of Ramsar sites designated for waterbirds, available by Ramsar region (available from Ramsar Sites Database); - ecological character status of Ramsar sites important for/designated for waterbirds (could be derived from effectiveness Indicator B, if handling of its datasets includes coding for Ramsar site Criteria for each site)
Role of Contracting Parties, including relationship of indicator to Ramsar National Reports process	The main datasets used for this indicator are not collected and reported at national scale, and are analysed at supra-national biogeographic population and flyway scales. Where a national waterbird monitoring scheme exists which generates national status and trend information, CPs may have a role in ensuring that its results and analyses are made available to further inform the global, regional and flyway scale assessments. Process indicator information needed for assessment of this indicator includes Ramsar Site designations for waterbirds. This information can be extracted from the on-line Ramsar Sites Database.
Scale(s) - *Global, regional, national, sub-national/ site or combination of these*	1. Global, analysed by waterbird family, flyway (some families), Ramsar region, migratory/resident status 2. National (where country has waterbird monitoring scheme)
Periodicity and timing, of (a) data-collation and analysis (b) presentation of results	a) *WPE* is scheduled to be updated every 3 years; IWC is updated annually with midwinter count data supplied at site level. b) Analysis and assessment should be made every three years.
Baseline	In relation to 2010 target set by WSSD, baseline should be WPE3 (2002) dataset. For some populations it is possible to backtrack trends prior to 2002.
Data sources *(following Resolution VIII.6 standard record for meta-inventory)* **and acquisition** *(including accessibility and costs)*	Global: 1. International Waterbird Census (IWC) database 2. *Waterbird Population Estimates* (*WPE*) National: National waterbird census and monitoring schemes (where available) [costs of data access to be determined]

Data custodians and coordinators *(following Resolution VIII.6 standard record for meta-inventory)*	Global: Wetlands International (plus ?USGS/Canadian Wildlife Service for North America) National: National waterbird census and monitoring schemes
Data collators and analysts	[Provisionally – to be agreed] Wetlands International and its Specialist Groups/Associated Experts
Type of statistics generated and units	1. Current trend status of populations. 2. Change in trend status of populations: no. of populations with improved status (decline to stable, stable to increasing); no. with deteriorating status (increase to stable, stable to decline); no. with no change (continuing increase, continuing stable, continuing decline). 3. For regions with good data quality (e.g. annual data collection), long-term trend indices, either by species/population and/or consolidated index. Latter could be disaggregated to look at trends in e.g. common widespread species/populations vs. geographically/ecologically restricted populations; and also population trends in designated Ramsar sites vs. non-designated wetlands.
Presentation of results: *(described in summary here, and if possible illustrated by some worked examples, eg of graphics, in an annex to the factsheet)*	For different waterbird groups (families) and at global, flyway and geographic regional scales, including: 1. Current trend status of populations; 2. Change in trend status of populations: no. of populations with improved status (decline to stable, stable to increasing); no. with deteriorating status (increase to stable, stable to decline); no. with no change (continuing increase, continuing stable, continuing decline); 3. Identification of flyways, and waterbird populations of conservation concern; 4. Correlational analyses by region of population status in relation to numbers of Ramsar sites (and possibly other protected status) designations; consolidated trends for populations on Ramsar sites vs. other wetlands (for selected regions). 5. Assessment of major likely drivers of change to different groups of populations Note. National assessments, where available, can be presented as annexes to the broader-scale analyses, and can be used to demonstrate and help inform assessment of broader-scale trend patterns. [Example global and flyway-scale analyses and assessment will be available in COP9 DOC. XXX]
Limitations, and assumptions *(caveats to interpretation and minimum requirements*	a) WPE trend estimates are as yet not consistently updated – for especially some regions and taxa estimates have been carried over from previous of the 3-yearly assessments, and some date back to the 1970s/1980s, since when major

for validity)	status changes may have occurred – care in analysis and interpretation of recent patterns therefore needs to be take in analysis and presentation of results. b) as at WPE3, trend estimates could be made for only 50% of all recognised populations – and proportion of populations for which estimates are available are especially low in the Neotropics and Oceania. c) Most estimates in *WPE* are 'best expert assessment' rather than being statistically generated – so confidence limits of trend and change in trend are not possible; for some regions, notably Western Palearctic and North America, statistical long-term trends are generated for some taxa - notably Anatidae and waders (shorebirds) - from IWC datasets.
Action steps required for development and implementation of the indicator	Specification of precise types of analyses required from existing datasets; confirmation of who will prepare assessment analyses, and timeframes for these.
Costs and sources of support	Wetlands International currently funds the IWC and preparation of *Waterbird Population Estimates* from a variety of donors and core funds. Behind this is extensive volunteer effort from WI/IUCN's waterbird Specialist Groups. National waterbird monitoring schemes are nationally resourced, but again often depend on extensive volunteer counting effort. The source dataset compiled as *Waterbird Population Estimates* is publicly available. Additional resources are likely to be needed to undertake some of the forms of assessment analysis required for this indicator.
Future possible enhancements of the indicator and/or its use	For waterbirds: • WPE/IWC currently covers 33 families of waterbirds. Seabirds are not currently included, but it is planned to expand future WPEs to cover these, plus also wetland-dependent species in other families. • Statistically valid trends, rather than 'best expert assessment' are likely to be possible for an increasing number of populations in the future. For other taxa: • possible future extension to sub-indicators for other taxa e.g. amphibians; freshwater and marine turtles.

Indicator G. Changes in threat status of wetland taxa

[Red List sub-indicator factsheet for waterbirds, and for amphibians, under development]

Indicator H. The proportion of candidate Ramsar sites designated so far

Indicator theme	**Ramsar Site designation progress**
Indicator Code	**H**
Indicator title	**The proportion of candidate Ramsar sites designated so far**
Sub-indicator	**Coverage of the wetland biodiversity resource by designated Ramsar sites**
Purpose *(summary for decision-makers of what the indicator shows including relation to Convention effectiveness (hypotheses) and assumptions about surrogacy)*	The Convention's Strategic Framework for Ramsar site designation calls of a "coherent and comprehensive national and international network" of Ramsar sites. This indicator assesses the extent to which this goal has so far been delivered, and the implications for Convention effectiveness of the extent of this delivery. The long-term targets of the Strategic Framework call for different patterns of designation of wetlands. For example, under Criterion 1 Parties the target is for Parties to have designated at least one site for each wetland type occurring within a biogeographic region. Under Criteria 5 and 6, all wetlands qualifying are expected to be designated. This indicator assesses the extent to which current Ramsar site designations are consistent with achievement of these long-term targets. Thus the assumption underlying this indicator is that designating wetlands as Ramsar sites affords an increased degree of safeguard of the ecological character of these sites through, for example, raised awareness of the importance of the site leading to reduced development or conversion pressure, the application of legislation for safeguard, and/or management planning processes designed to maintain the ecological character of the site. This assumption is tested by the indicator on the ecological character status of Ramsar sites.
Relationship to other Ramsar indicators, and to any sub-indicators	Although the act of designating Ramsar sites is primarily a process-oriented indicator of Convention implementation, taken in conjunction with knowledge of the distribution of the global wetland resource, assessment of the patterns of designation of Ramsar sites for different wetland types and features of wetland biodiversity can be used to give insights into the ecological outcome effectiveness of the Convention, particularly when viewed in conjunction with the assessment of some of the other effectiveness indicators, notably Indicator A).
Relevance to 2010 targets and other indicator processes	Directly relevant to the delivery of CBD 2010 indicator on "coverage of protected areas.
Broad types of data required	Distribution and area of wetland types (by country), and other features of the wetland resource such as wetland-dependent species including waterbirds. Some global datasets for wetland types are available (e.g. for coral reefs and mangroves) (see also Indicator A), and features such as waterbirds. Ideally, information should come from e.g. national baseline wetland inventories, in particular those and other sources (such as wetland directories and national lists of candidate Ramsar sites) which identify important localities for the feature.

	Up-to-date and comprehensive information on the features of each designated Ramsar site is essential for the application and analysis of this indicator – this is maintained by the Ramsar Sites Information Service, operated on behalf of the Convention by Wetlands International.
Role of Contracting Parties, including relationship of indicator to Ramsar National Reports process	As indicated for indicator A, improvements in the availability of national wetland inventory information would make a significant contribution to the scope of implementation of this indicator. The indicator will also provide an approach to the STRP's task of defining what is meant by "under-representataion" in the Ramsar List, in relation to the intent of the Ramsar sites *Strategic Framework*.
Scale(s) - *Global, regional, national, sub-national/site or combination of these*	Assessment analyses should be presented globally, by Ramsar region and by Contracting Party. For waterbirds, analysis should be also by biogeographic population, and (where appropriate) by flyway – see e.g. Stroud et al 2004 *International Wader Studies* 15).
Periodicity and timing, of (a) data-collation and analysis (b) presentation of results	Three-yearly, given the progress in continuing designation of Ramsar sites.
Baseline	COP7 (1999) provides an appropriate baseline since that is when the *Strategic Framework and guidelines for the further development of the List of Wetlands of International Importance* (Resolution VII.11) was adopted, which establishes the goals and targets for the List.
Data sources *(following Res VIII.6 standard record for meta-inventory) and acquisition (including accessibility and costs)*	For wetland types, see Indicator A.. For the species level of biodiversity, this indicator could at present be applied to waterbirds in relation to Criteria 5 and 6, from analysis of Wetlands International's International Waterbird Census data and BirdLife International's Important Bird Areas (IBA) programme. BirdLife have already undertaken such assessments for IBAs in relation to designated Ramsar sites for Africa and Europe, and are currently (2005) preparing an equivalent analysis for Asia. However, globally comparable data are unlikely to be available for other wetland-dependent taxa. For globally threatened species in relation to the application of Criterion 2, it may be possible to use information on range states in relation to species' distribution from the IUCN Red List database.
Data custodians and coordinators *(following Res VIII.6 standard record for meta-*	[to be completed]

inventory)	
Data collators and analysts	[to be completed]
Type of statistics generated and units	Several, progressively more detailed, assessment measures are possible: 1. The number and proportion of Parties whose territories contain the wetland type or feature which have designated Ramsar sites which include the wetland type or feature; 2. The number and proportion of wetlands of each wetland type or feature qualifying for designation which have been wholly or partly designated. 3. The proportion of the total area of the type or feature (possible for habitats only) or total population (for waterbirds and other species) which occur in designated sites. Note that for migratory species and populations this assessment should be made for each season (breeding, migratory staging and non-breeding). However, for wetland types a major limitation of currently available RIS information is that for most designated sites the area of each wetland type occurring within the site has not been calculated. Therefore area analyses must be treated with caution since the designated area is not usually the same as the designated area of the particular wetland type. 4. In relation to Criterion 1, another assessment measure could be for each Party the number of different wetland types cited as the reason for designation, compared with the number of wetland types in the Ramsar Classification of Wetland Types which are known to occur in the territory of the Party. However, there are several reasons to suppose that this overall delivery of Criterion 1 will be very difficult to assess. First, the Criterion and its target calls for designation in the context of biogeographic regions, but no consistent regionalization scheme or schemes have been adopted to support this application. Second, it may be difficult to deduce this information on wetland types for which sites have been designated (rather than just recorded as occurring within the site, whether as a dominant wetland type or not). Third, it may also be hard to identify the full range of wetland types occurring in each Party's territory. Note. For most assessment analyses for wetland types, areas within overseas and dependent territories should be included in the assessment in the Ramsar Region in which they lie geographically.
Presentation of results *(described in summary here, and if possible illustrated by some worked examples, eg of graphics, in an annex to the factsheet)*	See "Type of statistics generated and units" above. A test assessment for coral reefs has been prepared by the Secretariat and is included in COP9 DOC. Xxx. Presentation of such wetland type results can show, for example the numbers of Parties by Ramsar region which have, and have not, designated sites for a wetland type:

Numbers of Ramsar Parties which have, and have not, designated coral reef Ramsar sites, by Ramsar region. (Note. Numbers for dependent and overseas territories geographically lying in each region are given in parentheses.)

Ramsar Region	No. of Ramsar Parties with coral reefs occurring in their territory	No. of Ramsar Parties which have designated coral reef Ramsar sites	No. of Ramsar Parties with coral reefs which have not designated coral reef Ramsar sites	No. of non-Ramsar countries with coral reefs
Africa	13 (1)	5	8 (1)	2
Asia	13 (1)	3	10 (1)	9
Neotropics	14 (11)	9 (2)	5 (9)	8
North America*	2 (0)	1	0	0
Europe*	0 (0)	- (3)	-	-
Oceania	8 (6)	2	5 (6)	11
Total	**51 (18)**	**20 (5)**	**29 (13)**	**30**

*Four countries (USA, UK, France and the Netherlands) have overseas or dependent territories in other Ramsar regions which have coral reefs.

Where the areal distribution of the wetland feature is know, this can be used to identify potential future designation priorities, where there are major coverage gaps – in Parties with a large areas of the resource but which have not yet designated any sites for the feature.

Where a comprehensive list of potential Ramsar sites exists for a particular feature, the proportion of candidate sites designated so far can provide an indication of the extent of coverage, and gaps in the network. An example of this type of analysis is provided by BirdLife International 2004 (*State of the World's Birds*, p67).

Limitations, and assumptions *caveats to interpretation and minimum requirements for validity*

The indicator can be applied only to wetland types and other features of wetland biodiversity where there is data available about the global distribution and size of the type or feature, and this is not yet available for many types and features of wetlands. Ideally such information would also identify important areas (which might qualify for designation) within this resource, but even where such information exists it is generally neither readily accessible nor global in coverage.

For wetland types, area and distribution estimates by country are available for only some wetland types: coral reefs

	(UNEP-WCMC 2001; ???ICRI), mangroves (UNEP-WCMC 2001; ??FAO Forest Assessment Programme), and peatlands (GPI – Joosten) – and possibly some other types of forested wetlands (FAO Forest Assessment Programme – see CBD's list of 2010 target indicators). Another limitation when examining wetland type designations under Criterion 1 is that these are expected to be made on the basis of biogeographic regions, but no such schemes have yet been agreed for use by the Parties. As a surrogate, these analyses have to be performed at the national scale. A plausible justification for this approach is that if a Party has a significant area of a wetland type within its territory, designation of a part or parts of each such wetland type should be done to contribute to the "coherent national network" of Ramsar sites called for by the *Strategic* Framework. However, many wetlands can be and are designated also under other the Criteria: Criterion 2 for globally or nationally threatened species; Criterion 3 for the role in the site of maintaining the biological diversity of the area; Criterion 4 for the role of the wetland in maintaining the life-cycles of wetland-dependent species; Criteria 5 and 6 for internationally important waterbird populations; and Criteria 7 and 8 for the diversity and characteristics of fish species. For waterbirds, a number of assessments of the location of sites qualifying under Criteria 5 and/or 6 have been made, and data held in Wetlands International's International Waterbird Census databases may be analyses to yield more comprehensive information on such sites. Analyses have been prepared for certain waterbird taxa and regions which provide lists of sites qualifying under criteria 5 and 6 (Anatidae Atlas, W Palearctic Wader Atlas; A-P flyway atlases for Anatidae, shorebirds and cranes), although some of these are in need of updating, and extending these analysis for a wider range of taxa. In addition, BirdLife International's IBA programme and database can yield information on wetlands which may qualify for Ramsar designation for waterbirds under Criteria 2, 4, 5 and 6. This assessment has already been made by BL, for Africa, Middle East and Europe (State of the World's Birds 2004), and will done for Asia in 2005.
Action steps required for development and implementation of the indicator	[to be added]
Costs and sources of support	[not available]
Future possible enhancements of the indicator and/or its use	[to be added]

Draft COP9 DOC. Xxx
Information Paper

Background and rationale for the development of Ecological "outcome-oriented" indicators for assessing the implementation effectiveness of the Ramsar Convention

Background and progress

1. Paragraph 19 of COP8 Resolution VIII.26 requested the STRP to:

> "prepare a series of key indicators in relation to the effective implementation of the Strategic Plan in the next triennium, to be used as part of the National Report Format. These indicators should be adopted by the Standing Committee at its annual meeting in 2004, so that Parties may use them to complement their National Reports when they are finalised in preparation for CoP9 in 2005".

2. The STRP established its Working Group 6, co-led by David Pritchard (BirdLife International) and Teresita Borges (Cuba) to undertake this work, which was identified by the Standing Committee as a priority for the 2003-2005 triennium.

3. The task has proved to be a particularly challenging one for the STRP and its Working Group, and it has not been possible to progress this work as rapidly as was anticipated by Resolution VIII.26.

4. The particular challenge faced by the STRP's Working Group has been to identify indicators which go beyond just the assessment of status and trends (such as is being done by the Convention on Biological Diversity to assess achievement of the 2010 biodiversity target) and which could be formulated in such a way as to yield insights into the Convention's effectiveness, in conjunction with analysis of certain 'process-oriented indicators' such as those in the COP9 National Report Format.

5. Nevertheless the Working Group has made significant progress in preparing the rationale and basis for such indicators, has identified a set of indicators for immediate implementation and others which could be subsequently developed, and is currently, with the assistance of consultant Val Kapos of UNEP-WCMC, preparing indicator 'factsheets' for this first tranche of indicators using a standard template.

STRP's approach to this work

6. The Working Group reviewed a range of about 1,000 potentially relevant existing indicators in use or under development by other processes and which are documented in literature, as well as devising new suggestions for the purpose of responding to the COP8 request.

7. An initial set of 19 proposals for indicators for Ramsar use were distilled, with comments on their potential application, and progress on this was reported to the 30th meeting of the Standing Committee January 2004 (DOC. SC30-7).

8. The Working Group's initial 19 suggested indicators were categorised (for illustrative purposes) into categories of "state", "pressure" and "response". However, no attempt was made to match each "pressure" indicator with a corresponding "response" indicator. This was partly in order to reduce the length of the list, but it was also because the Working Group considered that there was merit in each indicator being as self-contained as possible.

9. This allows for making clear within the indicator itself what the solution would need to be (in the case of pressure indicators) or what the problem is (in the case of response indicators), without relying on being "paired" with a complementary indicator in the other category. In the event, later and on the advice of the Standing Committee, this categorisation was found not to be helpful and was abandoned in subsequent stages of the work.

10. At its 12th meeting in February 2005, building on the outline prioritization of the original 19 indicator proposals undertaken at a workshop in July 2004, THE strp agreed a first tranche of a "top seven" priority indicators for which proposals were to be further developed in the form of "factsheets" and sample analyses for each indicator by the Working Group, the Secretariat and an independent consultant. The list of proposed indicators is provided in Table 1.

Table 1. Possible ecological "outcome-oriented" indicators considered for assessing the implementation effectiveness of the Ramsar Convention, and the priorities for their development.

Proposed Indicators	SC30-7 indicator reference number
I. Priority indicators, for factsheets development for COP9 consideration	
Wetland resource - status **A. The overall conservation status of wetlands**	4
Ramsar sites – status **B. The status of the ecological character of Ramsar sites**	1
Water resources - status **C. Water-related indicator(s)**	–
Ramsar sites – threats **D. The frequency of threats affecting Ramsar sites**	11
Wetland management **E. Wetland sites with successfully implemented conservation or wise use management plans**	2
Species/populations status **F. Overall population trends of wetland taxa**	8
Threatened Species **G. Changes in threat status of wetland taxa**	9
Site designation progress **H. The proportion of candidate Ramsar sites designated so far**	14
II. For possible development in a second tranche, post-COP 9	
Ramsar sites – designation progress **I. Coverage of wetland–dependent bird populations by Ramsar sites**	16

Wetland services **J. The economic costs of unwanted floods and droughts**	19
Legislative & policy responses **K. Legislative amendments implemented to reflect Ramsar provisions**	13
Legislative & policy responses **L. Wise use policy**	–
III. Initial proposals, but not proposed for further development and/or considered to be covered within other proposed indicators	
Wetland ecosystems **M. The extent of [relatively undegraded?] wetland habitat**	3
Wetland status **N. The proportion of each type of wetland "effectively conserved"**	5
Species status **O. Population levels of selected wetland taxa**	7
Ramsar site coverage **P. Coverage of threatened taxa by Ramsar sites**	15
Restoration **Q. The number of wetland restoration schemes underway**	17
Decision-making **R. Plans affecting wetlands that are positively modified in the light of an impact assessment**	18
Wise use in practice **S. The proportion of current wetland uses that are considered sustainable or "wise" use**	6
Effects of site designation **T. The response of waterbird populations to Ramsar site designation**	10
Stakeholder attitudes **U. The views of affected communities about Ramsar objectives**	12

11. In undertaking this further development of "factsheets" for the first tranche of indicators, it has become clear that one of the initially proposed indicators (concerning THE Ramsar site designation progress) which the STRP had considered could not be developed at this stage could in fact be applied for certain aspects of wetlands from existing readily-available data sources, and this has now been included in the first tranche of proposed indicators.

12. The basis and rationale for the selection and development of these indicators is explained further below.

13. The Working Group also identified recorded some initial ideas on ready-made indicators in use elsewhere, which might be readily adopted or adapted (through dis-aggregation for the Ramsar context) for the priority Ramsar set, including the Red List Index, and an indicator on water quality proposed to be led by GEMS-Water for the Convention on Biological Diversity and the World Water Development Report - II.

14. The Working Group has also examined the role of qualitative knowledge-based assessments, of the type used successfully by the Secretariat in the MedWet region to provide an assessment of the status of wetlands in the Mediterranean Basin, which was presented to the 6th meeting of the MedWet Committee in December 2004 and drawn upon by Wetlands International for the European Environment Agency (EEA). Such approaches can usefully be a basis for the information to be collated for some of the

priority indicators at the "wetland site" scale and could also be a source of good approaches for publishing and promoting findings (i.e., as a CEPA tool).

15. Input to the work of developing the effectiveness indicators has been made also by STRP Working Group 1 concerning ecological character and related issues and by Working Group 3 on proposals for water-related indicators.

16. A template for indicator factsheets has been agreed by the Working Group and STRP (see Table 2). Its purpose is to be a framework for the consultant to use to elaborate the design and operation of each indicator, and a tool thereafter for those who will compile, analyse and present the data and findings.

Table 2. Indicator Factsheet fields template

- Indicator theme
- Indicator Code:
- Indicator title:
Sub-indicator*:*
- Purpose: summary for decision-makers of what the indicator shows including relation to convention effectiveness (hypotheses) and assumptions about surrogacy
- Relationship to other Ramsar indicators, and to any sub-indicators:
- Relevance to 2010 targets and other indicator processes:
- Broad types of data required:
- Role of Contracting Parties, including relationship of indicator to Ramsar National Reports process
- *Scale(s) - Global, regional, national, sub-national/site or combination of these
- *Periodicity and timing, of (a) data-collation and analysis (b) presentation of results
- *Baseline
- *Data sources (following Res VIII.6 standard record for meta-inventory) and acquisition (including accessibility and costs)
- *Data custodians and coordinators (following Res VIII.6 standard record for meta-inventory)
- *Data collators and analysts
- *Type of statistics generated and units:
- *Presentation of results: (described in summary here, and if possible illustrated by some worked examples, eg of graphics, in an annex to the factsheet)
- *Limitations, and assumptions: caveats to interpretation and minimum requirements for validity
- *Action steps required for development and implementation of the indicator
- *Costs and sources of support
- Future possible enhancements of the indicator and/or its use

(*Asterisked items might need repeating for any sub-indicators under each indicator)

Requirements for Ramsar effectiveness indicators

17. It is important to recognise that the proposals which have been developed through the STRP's work aim only to illuminate some particularly useful examples of Convention implementation issues. There has been no intention (and it would be an unrealistic idea) to present consolidated measures and indicators which would somehow "sum up" the effectiveness of everything done under the Convention. That is not the purpose of indicators in general.

18. Therefore the proposals are for what may be termed "flagship" or "headline" indicators, in the sense of being those which function well as a common and user-friendly totemic touchstone for the questions being addressed. Note that this is not to be confused with the use of the term "headline" in some other fora to refer to indicators which are representative aggregates of the overall situation concerning a range of variables.

19. It would not be sufficient simply to have indicators that allow a conclusion that "the Convention is effective". There needs to be some ability to also give information on the extent to which it is effective. That said, the current exercise is about giving an indication, not a comprehensive analysis, and not a comprehensive conclusion about effectiveness as a whole.

20. Working Group 6 defined some initial criteria for indicator selection, such that the indicators had to:

    1) be simple and pragmatic;
    2) be capable of distinguishing the difference made by the Ramsar Convention;
    3) preferably reflect composite variables;
    4) relate to information which can be reasonably expected to be available, at least in the next triennium if not in the current one; and
    5) (at least in some cases) lend themselves to use by wide popular audiences.

21. It was also established that while some of the indicators would be designed for use by Contracting Parties at site or national level, some should be designed to operate at a supra-national scale. Information for site or national-level indicators should, where possible, be capable of aggregation to larger, including global, scales. This is particularly important for assessments relating to, for example, biogeographical populations of wetland fauna and to the global synthesis questions posed by *inter alia* the WSSD 2010 target.

22. The indicators supplement and should be complementary to those in the COP9 National Report Format, and they are designed to add value to it in ways which will offer a stronger basis for evaluating the effectiveness of Convention's implementation in terms of ecological outcomes.

23. In contrast to many other endeavours of this kind, the emphasis sought here is on indicators which relate to "science-based" ecological outcomes, rather than to institutional processes ('process-based indicators'). While it remains important to track the latter (e.g., numbers of sites with monitoring schemes in place, numbers of species with recovery plans, level of resourcing going into wetland work, etc.), the focus here is intended to be the state of the wetland environment itself. 'Process-based indicators' form the great majority of the indicators in the COP9 National Report Format.

24. Furthermore, the purpose of the request in ResolutionVIII.26 is not simply to evaluate factors which might show the status and trends of wetland variables, but rather to show whether the Convention is being effectively implemented – i.e., whether it is making a difference in the way intended.

25. In designing the proposed indicators, the STRP's Working Group has also made an attempt to offer a basis for a contribution from the Ramsar Convention to the assessment of progress towards the WSSD and CBD targets of "significantly reducing the rate of loss

of biodiversity by 2010". This is a key objective for the Convention as a whole, and it is part of the context for the timescales relating to this area of the STRP's work.

26. The amount and type of information sought should not be determined by how much it is possible to provide, but rather by what is needed in order to answer a hypothesis-based question. The indicator information must also be such as to enable relevant actors in the Convention to trigger corrective action if required.

27. In addition, the ability to collect information will not in itself be sufficient without a capability also to verify and corroborate its veracity, and to validate conclusions statistically and express confidence limits. Much current data suffer from sampling design deficiencies that weaken their use for quantitative indicators. For indicators of change, good rigour is essential regarding consistency of methods, comparing like with like and so on. However, the formal frameworks offered by a convention should constitute an advantage in this regard.

28. Desirable attributes of indicators in the light of these criteria will not all be additive, and in some cases there are trade-offs to be made between them. For example, one such trade-off is between precision and feasibility, and for the purposes of this exercise, feasibility has been given higher priority.

29. The choice of the first tranche of indicators to be worked up into full factsheets was based on:

    i) priority rankings for importance in respect of effectiveness of the Convention;
    ii) feasibility;
    iii) creation of an initial suite of indicators which, in combination, span a range of key issues; and
    iv) favouring initially some indicators which are generic or "umbrella" in character, and which are capable of incorporating elements from some of the others in the original list developed by the STRP.

The relationship of the proposed Ramsar indicators to other Ramsar processes, and the question of "effectiveness"

30. The Ramsar Convention already has a wide suite of information management tools and processes which should shed light on how well it is performing. These include the extensive National Report Format and its framework of targets and indicators, linked to COP decisions and the objectives of the Strategic Plan. The identification of 'Key Result Areas' (KRAs) and Key Performance Measures (KPMs) in the proposed Strategic Framework for the Implementation of the Convention (DOC. SC31-22 [COP9 DR9]) offers a further contribution to targeting and assessing Convention implementation.

31. Others include mechanisms linked to the List of Wetlands of International Importance (including the Ramsar Sites Information Service, on http://www.wetlands.org/RSDB/Default.htm), the periodically updated Ramsar Information Sheets, and the Montreux Record.

32. However, it is striking that, at present, these various sources do not link in a coherent way to a baseline founded on the ecological character of wetlands, and they do not offer

workable and robust ways of drawing conclusions about the effectiveness of the Convention and its implementation (see discussion in COP8 DOC. 20).

33. However, the Convention can congratulate itself on having given global leadership in devising some tools and mechanisms which are of excellent quality in themselves. As well as those mentioned above, these also include various tools for wetland inventory, assessment and monitoring, and in respect of these, STRP's Working Group 1 is currently developing a more integrated approach for the future. Setting that together with the current work of Working Group 6, the prospect is offered now of a more integrated (and moreover simplified) approach to the business of objectives, targets, baselines, indicators, measurements and conclusions about progress across all aspects of the Convention as a whole. This in turn should lead to the content of some of the individual elements, such as national reporting, becoming simpler and more multi-purpose in future.

34. One existing provision which is particularly helpful is Objective 4.1 of the *Strategic Framework and guidelines for the future development of the List of Wetlands of International Importance* (Annex to Resolution VII.11 and Strategic Plan action 11.2.2), "to use Ramsar sites as baseline and reference areas for national, supranational/regional and international environmental monitoring to detect trends in the loss of biological diversity, climate change, and the processes of desertification" (and to report on this in National Reports – indicator 11.2.2 in the National Report Format). Some of the indicators proposed in this paper will help to realise this aim – and in turn, the "trends in the loss of biodiversity" part, if it is achieved, should contribute to assessing achievement of the 2010 biodiversity target.

35. Although conventions are by their nature dominated very often by issues of institutional structures, the work reported in this paper has attempted for the most part to steer away from indicators based on those (e.g., numbers of sites with monitoring schemes in place, numbers of species with recovery plans, level of resourcing going into wetland work, etc.). It is very important to track such information, but the remit for the STRP for its work is to focus on "science-based" measures of effectiveness in terms of ecological outcomes, i.e., the state of the wetland environment itself.

36. This raises the issue of the relationship of this exercise with the Convention's Strategic Plan 2003-2008, which already contains a range of quantified targets and indicators. These targets and indicators are, as already implied, largely procedural and 'process-oriented'. However, a few do approach more closely the ecological type of questions which Working Group 6's task addresses. It is possible that we will have to recast the Strategic Plan in the context of COP9, given its overly complex structure and the concerns expressed by some Parties about its complexity.

37. The database structure for COP9 National Reports itemises the information required to track the targets in the Strategic Plan (and additional targets from certain COP decisions). This should be read as complementary to the additional proposals for ecological outcome-oriented indicators in this paper. The present proposals are intended not to duplicate what is currently in the National Report Format, but to add value to it in ways which will offer a stronger basis for evaluating the effectiveness of Convention implementation in terms of ecological outcomes.

38. This is necessary because the two tools address different, but complementary, aims. The Strategic Plan/National Report Format follows and accounts for the individual component

parts of Ramsar implementation processes and decisions. On the other hand, the indicators in this present STRP Working Group 6 exercise look at Convention delivery in terms of how different sets of these components combine to produce ecological results. Both types of evaluation may draw on the same activities by Parties and others, but the type of question they are each addressing is different.

39. Furthermore, to interpret the proposed indicators of effectiveness, it is necessary to have available a number of these 'process-oriented' indicators from National Reporting, and on Ramsar sites against which to analyse status and trends in the ecological data used for the effectiveness indicators. The effectiveness indicator factsheets include a field which identifies a number of the process indicators which are needed.

40. A further distinction it is essential to make is between the establishment of a target (which involves political considerations, properly the province of the Strategic Plan and other COP decisions) and the devising of an indicator, or indicators, to track progress towards achieving that target (a technical question, and properly the province of this work by the STRP).

41. In the present context, the "targets" at issue are effectively the objectives of the Convention itself, i.e., to stem the progressive encroachment on and loss of wetlands now and in the future (Convention preamble), according to the General Objectives for the three "pillars" of the Convention: 1) the wise use of wetlands; 2) the listing, managing and monitoring of Wetlands of International Importance (Ramsar sites), as a contribution to sustainable development; and 3) international cooperation, including technical and financial cooperation for wetland conservation and wise use.

42. Strictly speaking, indicators of effectiveness of the Convention might best be defined in relation to targets for effectiveness, but since the COP has not so far adopted such targets, for this current STRP work the main objectives of the Convention are being used as the targets.

43. The Ramsar Strategic Plan 2003-2008 sets out the relative emphasis which the Convention seeks to place on a range of issues, and it expresses a carefully crafted balance between them resulting from a comprehensively participative process throughout Ramsar's many constituencies. This is a great strength of the Convention. Again, the indicator proposals in this paper should be considered in tandem with the Strategic Plan, since they do not in themselves seek to say anything about these issues of balance.

Synergies and links with other indicator processes

44. In taking forward this work, an important dimension is the scope for synergies with other multilateral environmental agreements, each of which faces a more or less equivalent challenge in developing indicators, including indicators of relevance to the 2010 biodiversity target. This has been and will be further explored with the other MEAs as appropriate.

45. The global target adopted by the World Summit on Sustainable Development (Johannesburg, 2002) is to achieve by 2010 a significant reduction in the current rate of loss of biological diversity. At national level, other targets exist in National Biodiversity Strategies and Action Plans (NBSAPs) prepared under the Convention on Biological

Diversity (CBD). Where these relate to wetland habitats and species they may also provide a basis for development of Ramsar indicators.

46. Members of STRP Working Group 6 and the Ramsar Secretariat have contributed to the CBD process of developing 2010 indicators and targets and indicators for inland waters and marine and coastal biological diversity – these materials will be considered by CBD COP8 in March 2006.

47. The CBD has initiated a process for the development of a small number of 'outcome-oriented' global targets and indicators relevant to assessing achievement of the WSSD 2010 biodiversity target. As the Ramsar Convention is a lead implementation partner of the CBD on wetlands, it will be important to continue to ensure harmonisation between indicators developed under the CBD process – especially those relating to inland waters and coastal and marine biodiversity – and those prepared by the STRP. Collaboration on these developments will be undertaken under the *aegis* of the CBD-Ramsar Joint Work Plan 2003-2006. The CBD has specifically and formally requested that Ramsar contribute to that Convention's development of indicators on "trends in selected biomes" and "water quality", linked to the 2010 biodiversity target.

48. The CBD's SBSTTA10 (February 2005) has recommended to CBD COP8 that the following eight indicators be confirmed for immediate use, including in the Global Biodiversity Outlook:

a) Trends in extent of selected biomes, ecosystems and habitats;
b) Trends in abundance and distribution of selected species;
c) Coverage of protected areas;
d) Nitrogen deposition;
e) Marine trophic index;
f) Water quality in aquatic ecosystems;
g) Status and trends of linguistic diversity and numbers of speakers of indigenous languages; and
h) Official development assistance provided in support of the Convention.

And that the following five indicators were also found ready for immediate testing and use including in the Global Biodiversity Outlook:

a) Change in status of threatened species;
b) Trends in genetic diversity of domesticated animals, cultivated plants, and fish species of major socio-economic importance;
c) Area of forest, agricultural and aquaculture ecosystems under sustainable management;
d) Numbers and cost of alien invasions; and
e) Connectivity/fragmentation of ecosystems.

49. Those involved in taking forward finalization of the Ramsar indicators should continue to work closely with those preparing and implementing the CBD indicators so as to ensure as close as possible harmonization of the indicators being considered by Parties to both Conventions.

50. This approach as also discussed and agreed at a recent meeting (May 2005) of the Biodiversity Liaison Group of the five biodiversity-related conventions (CBD, Ramsar, CMS, CITES and World Heritage Convention).

Practical operation of the indicators

51. The request from COP8 was for indicators to be operated in conjunction with Contracting Party National Reports. The way this will work will need to be specified. At present the exact approach for COP10 national reports is something still to be determined and agreed by COP 9. In the meantime, the Working Group can advise that it envisages the two processes operating in parallel, with two key distinguishing factors between them:

    i) some indicators will operate at a supra-national level, perhaps coordinated internationally yet perhaps also drawing on material from national-level data; and some will be based on sites or catchments, perhaps coordinated sub-nationally – the National Reports clearly concentrate on information synthesised at national level.

    ii) the National Reports tend to focus on procedural measures, while the indicators aim to focus on ecological outcomes (though there is some overlap, and the desirability of making the difference clearer in future could be considered).

52. In relation to at least one of the priority indicators, there is an important relationship too with reporting under Article 3.2 of the Convention, and a description of this might also be worth drawing up.

53. There is also a need to define periodicity and timing issues regarding reports from the different indicators. These issues will be specified (in the factsheet) for each indicator individually. However, even though this may vary according to each of the processes that generate relevant primary data, etc., ultimately outputs are destined to be received by the COP, not least so that the Convention as a whole has an opportunity to consider collective responses to the picture painted by the results. In principle therefore outputs should be made available six months before each COP, to allow this.

54. Regarding the WSSD/CBD 2010 biodiversity targets and indicators processes, a Ramsar contribution to this process will be assured by a first status and trends report based on indicator data being generated in 2008 (at least on those indicators for which it is possible to do so at that time), and another in 2011 (which will allow an assessment then of performance against the 2010 target). Such information could also be provided to CBD for inclusion in its Global Biodiversity Outlook publications, as a contribution from Ramsar as CBD's lead implementation partner on wetlands.

55. Similar questions (i.e., of timing, etc.) will need to be examined in relation to reporting against the CBD's targets for its Programmes of Work on inland waters and marine and coastal biodiversity, in the context of Ramsar's cooperation arrangements with the CBD in relation to those programmes.

56. There is also a process management issue which needs to be clarified concerning how the results of indicator information will be collated, consolidated, evaluated and reported, and by whom. Some summary points on implementation issues such as these will be included in [COP9 DR2] on scientific and technical priorities for the next triennium. Issues of

presentation, publication and dissemination of findings and conclusions also need to be considered, looking where possible for good "CEPA opportunities", as do the cost implications of the mechanisms which may need to be established.

Other activities needed to develop the effectiveness indicator approach and mechanisms for implementation

57. Further work will be required to develop guidance on the application and use of the chosen indicators. Specific proposals for this have not yet been developed.

58. It may also be worth developing some generic guidance on presentational principles which will apply to all the indicators: e.g., all indicator assessment reports should include a section on "What do these results tell us about the effectiveness of implementation of the Ramsar Convention?"

59. Resolution VIII.26 envisaged that the effectiveness indicators would be used by Contracting Parties to complement their COP9 National Reports. This was dependent on the effectiveness indicators being finalised in 2004. In the event it has proved much more time-consuming to develop the indicators to their current stage, and furthermore, a number of the indicators will largely be analyses from supra-national data sources.

60. In its initial approach to the development of the effectiveness indicators, the STRP envisage an opportunity to invite Contracting Party Administrative Authorities who would be prepared, on a voluntary basis, to carry out pilot-testing of the indicators (or more specifically those for which data will need to be acquired at site or national level) as further developed with guidance on their application. As this guidance is now being developed within the factsheet approach for each indicator, and a number of tools supporting their implementation will need development, this has not been possible during this triennium. However, as part of Working Group 6's development of the indicators, a number of pilot assessment reports have been undertaken to test the types of analysis possible, the process-oriented indicators from National Reports and Ramsar Sites information Service needed for analyses, and presentation of outcomes. It is anticipated that these assessment reports could be further developed and included in the form of this paper provided to Contracting Parties at COP9.

61. It has also been suggested that the current list of effectiveness indicators overall is relatively light on indicators dealing with wise use policy issues and on indicators dealing with the ecosystem services provided by wetlands to humans. These issues might usefully looked at by the STRP in the next triennium, and proposals for such work are included in the Annex to COP9 DR2.

Other issues

62. It has been observed previously that this work on effectiveness indicators for Ramsar has progressed without the Convention having precisely defined targets for effectiveness as such, though these can be deduced from other adopted targets and objectives. Here the association with the CBD is beneficial, in linking to targets defined there, especially for the CBD's inland waters and coastal and marine programmes of work. This may nevertheless be an area for consideration in future.

63. In conjunction with other elements of the work of the STRP in the current triennium, it is apparent that Working Group 6's work on indicators is helping further with a process of building a more integrated overall approach to issues of objectives, targets, baselines, assessments, indicators, monitoring, reporting and conclusions about progress across all areas of Convention implementation. This is a significant advance for the Convention.

64. Furthermore, identification of the data and information needs for these effectiveness indicators has provided a strengthened purpose and need for the maintenance of effective and up-to-date information sources, including from comprehensive COP National Reporting, in maintaining the scope and detail of information on Ramsar sites in the Ramsar Sites Information Service, and the need to improve availability of information on the status and trends of the ecological character of Ramsar sites, in line with the COP8 Resolution VIII.8 request for the STRP to prepare such analyses. The approach embodied in some of the effectiveness indicators will facilitate this important aspect of the Convention's work, and in turn will contribute to the provision of information on the 2010 biodiversity target.

65. There is always a trade-off between precision and ease of use. Throughout Working Group 6's work, a conscious decision has been made to err in favour of pragmatism. It has been shown for example that much useful information can be generated by qualitative knowledge-based assessments. In this and in other respects, the Convention continues to give good global leadership in this area.

66. Finally, while the work which has produced the proposals put forward here is notable for the depth and rigour with which thinking has been tested and principles applied, it is clear that even with considerable input of voluntary time on the part of STRP members and others, only a very restricted basis for feasible measurement and assessment of Ramsar effectiveness is available at the present time. This is partly a function of the complexity of some of the issues involved – genuinely getting to the heart of the effectiveness question is a challenging matter. It is also a function of the limited existence of usable datasets on which to base relevant measures. Key amongst these are data which fall to Parties to provide through, for example, Ramsar Information Sheets and their updates and National Reports. The work so far delivers a clear message that for the Convention to have an adequate story to tell about its effectiveness (and the cost-effectiveness of the investment made in it by its Parties and others), much more efficient and complete information management and systematic provision by all, particularly at national level, will be required.

ANNEX

Demonstration examples of assessment analyses of Ramsar indicators of the effectiveness of the implementation of the Convention

[to be added]