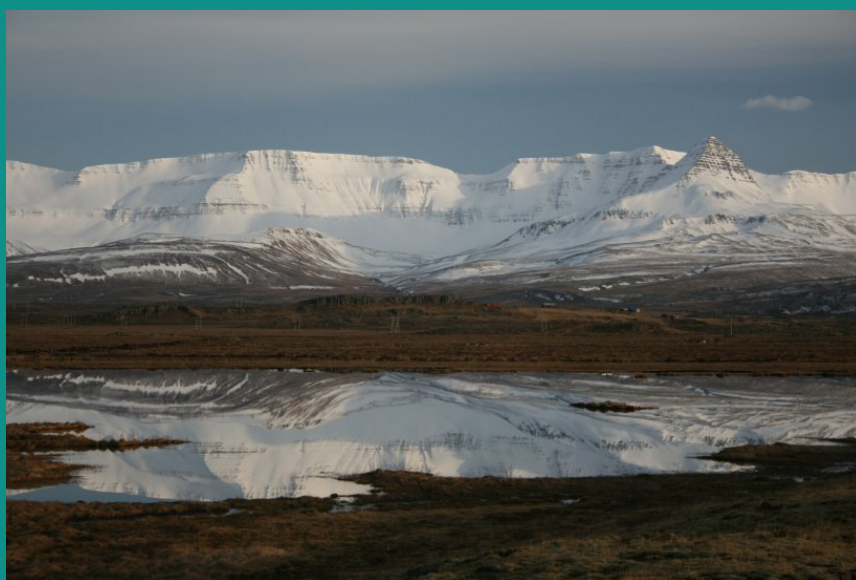


Ramsar
Handbooks
4th edition

Handbook 18

Managing wetlands





About the Convention on Wetlands

The Convention on Wetlands (Ramsar, Iran, 1971) is an intergovernmental treaty whose mission is “the conservation and wise use of all wetlands through local, regional and national actions and international cooperation, as a contribution towards achieving sustainable development throughout the world”. As of October 2010, 160 nations have joined the Convention as Contracting Parties, and more than 1900 wetlands around the world, covering over 186 million hectares, have been designated for inclusion in the Ramsar List of Wetlands of International Importance.

What are wetlands?

As defined by the Convention, wetlands include a wide variety of habitats such as marshes, peatlands, floodplains, rivers and lakes, and coastal areas such as saltmarshes, mangroves, and seagrass beds, but also coral reefs and other marine areas no deeper than six metres at low tide, as well as human-made wetlands such as waste-water treatment ponds and reservoirs.

About this series of handbooks

This series has been prepared by the Secretariat of the Convention following the 7th, 8th, 9th, and 10th meetings of the Conference of the Contracting Parties (COP7, COP8, COP9 and COP10) held, respectively, in San José, Costa Rica, in May 1999, Valencia, Spain, in November 2002, Kampala, Uganda, in November 2005, and Changwon, Republic of Korea, October-November 2008. The guidelines on various matters adopted by the Parties at those and earlier COPs have been prepared as a series of handbooks to assist those with an interest in, or directly involved with, implementation of the Convention at the international, regional, national, subnational or local levels. Each handbook brings together, subject by subject, the various relevant guidances adopted by Parties, supplemented by additional material from COP information papers, case studies and other relevant publications so as to illustrate key aspects of the guidelines. The handbooks are available in the three working languages of the Convention (English, French, and Spanish).

The table on the inside back cover lists the full scope of the subjects covered by this handbook series at present. Additional handbooks will be prepared to include any further guidance adopted by future meetings of the Conference of the Contracting Parties. The Ramsar Convention promotes an integrated package of actions to ensure the conservation and wise use of wetlands. In recognition of these integrated approaches, the reader will find that within each handbook there are numerous cross-references to others in the series.

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Ramsar handbooks for the wise use of wetlands
4th edition, 2010

Handbook 18

Managing wetlands

Frameworks for
managing Wetlands
of International
Importance and other
wetland sites



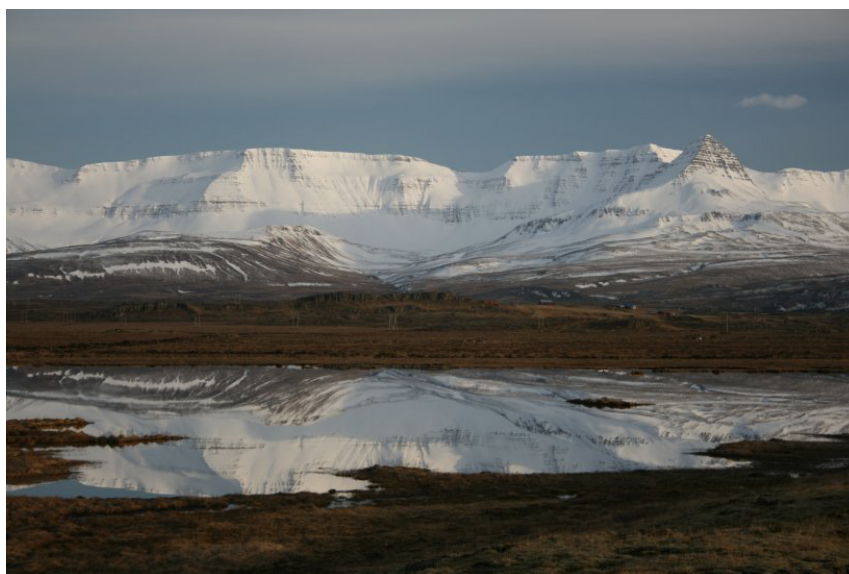
This 4th edition of the Ramsar Handbooks replaces the series published in 2007. It includes relevant guidance adopted by several meetings of the Conference of the Parties, in particular COP7 (1999), COP8 (2002), COP9 (2005), and COP10 (2008), as well as selected background documents presented at these COPs.

Acknowledgements

The Ramsar Convention Secretariat wishes to acknowledge the very many people who have, over several years and numerous meetings of the Conferences of the Contracting Parties, contributed their knowledge and experience in the area of wetland site management and monitoring. Their collective efforts have allowed the Convention to develop this integrated management package. Special mention should be made of the contributions by Prof Max Finlayson (now Director of the Institute for Land, Water and Society at Charles Sturt University, Australia) in the areas of ecological character, monitoring, and wetland risk assessment. The guidance relating to risk assessment was adopted by the 7th meeting of the Conference of the Parties (COP7, 1999), which followed an experts' workshop held at the Ramsar Secretariat in April 1998, preceding the 7th meeting of the Scientific and Technical Review Panel (STRP). The authors of the Wetland Risk Assessment Framework, Prof Finlayson, Dr Rick van Dam, and Dr Chris Humphrey of the Environmental Research Institute of the Supervising Scientist, Australia (eriss), deserve special thanks. The Secretariat also extends its thanks to eriss and the National Wetlands Programme of Environment Australia for supporting the authors during their development of this guidance.

The *New Guidelines for management planning for Ramsar Sites and other wetlands* adopted by Ramsar COP8 (2002) were prepared by an STRP Working Group, and special thanks are due to Mike Alexander (Countryside Council for Wales – UK) and Dr Mike Acreman (Centre for Ecology and Hydrology – UK) for their preparation of drafts of this guidance. The guidance on wetlands and fisheries, adopted by COP9 in 2005, was derived from information in a draft report prepared by Dr Robin Welcomme for the STRP, with financial support from IUCN and WWF. Thanks are extended to all involved for their support for this work, including the STRP for the preparation of the draft COP9 Resolution on this topic. The underlying full report is presently being prepared for publication as a Ramsar Technical Report.

All Resolutions of the Ramsar COPs are available from the Convention's Web site at www.ramsar.org/resolutions. Background documents referred to in these handbooks are available at www.ramsar.org/cop7-docs, www.ramsar.org/cop8-docs, www.ramsar.org/cop9-docs, and www.ramsar.org/cop10-docs.



Lake and associated peatland called Grímarstaðavatn near Hvanneyri in western Iceland, 2007. Photo: David Stroud, JNCC.

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Getting the most out of this Handbook

The Handbooks in general

The purpose of the Ramsar Handbooks is to organize guidance material from relevant decisions adopted by the Contracting Parties over the years, according to subject themes. This helps practitioners to implement the internationally-agreed best practice in a way that is convenient to handle and more naturally matches their own everyday working environment.

The intended readership includes national and local staff of the government departments, ministries and agencies that act as Administrative Authorities for the Ramsar Convention in each country. Equally important users in many cases are managers of individual wetland areas, as some aspects of the guidance relate specifically to site management.

The Ramsar guidance has been adopted by member governments as a whole, and increasingly it addresses itself to the crucial roles of other sectors beyond the “environment” or “water” sectors. It is thus very important that these Handbooks should be used by **all** whose actions may benefit from or impact upon the wise use of wetlands.

A vital first step in each country therefore is to ensure adequate **dissemination** of these Handbooks to all who need or can benefit from them. Copies are freely available in PDF format from the Ramsar Secretariat in three languages on CD-ROM or by download from the Convention website (www.ramsar.org).

Other early steps would be, in each particular context, to **clarify** lines of responsibility and **actively check** how to align the terms used and approaches described with the reader’s own jurisdiction, operating circumstances, and organizational structures.

Much of the text can be used in a **proactive sense**, as a basis for framing policies, plans and activities, sometimes by simply importing relevant sections into national and local materials. It can also be used in a **reactive sense** as a source of help and ideas for responding to problems and opportunities, navigating subjects by the need of the user.

Cross-references, original sources, and further reading are liberally cited: the Handbooks will often not be the “last word”, but they provide a helpful “route-map” to further sources of information and support.

Strategic direction in the Ramsar Convention is provided by the Strategic Plan, the latest version of which was adopted by COP10 in 2008 for the period 2009-2015. All thematic implementation frameworks, including the Handbooks, sit within the context of the goals and strategies of this Plan and the priorities it highlights for the period covered.

In this fourth edition of the Handbooks, additions to and omissions from the text of the original guidelines, required by the results of COP8, COP9 and COP10, are shown in square brackets [...].

The Handbook series is updated after each meeting of the Conference of the Parties, and feedback on user experience is always appreciated in helping to refine each new edition.

This Handbook (Managing wetlands)

In relation to the management of Ramsar Sites and other wetlands, Strategy 2.3 of the Strategic Plan concerns management planning, and the Key Result Area to be achieved for this Strategy by the year 2015 is “Adequate management planning processes established and submitted with all or most new site designations or a commitment made to work towards that goal, taking into account the possible lack of financial and human resources to fulfill this objective, and recognizing that the designation of a site can work as an incentive for the establishment of future management planning”.

Strategy 2.4 is to “maintain the ecological character of all designated Ramsar Sites, through planning and management”; with Key Result Areas including:

- 2.4.i Progress in developing effective management plans for all Ramsar Sites within each Party’s territory.
- 2.4.ii Management objectives, as part of management planning, for ecological character maintenance established for all Ramsar Sites.
- 2.4.iii Zoning measures to be put in place for larger Ramsar Sites, wetland reserves, and other wetlands (Recommendation 5.3 and Resolution VIII.14) and strict protection measures to be enacted for certain Ramsar Sites and other wetlands of small size and/or particular sensitivity.
- 2.4.iv Cross-sectoral site management committees in place for Ramsar Sites, involving relevant government agencies, citizens and local communities, and other stakeholders, including the business sector as appropriate, in place, including as a mechanism for dispute settlement.
- 2.4.v Statements of ecological character finalized for all Ramsar Sites and used as a basis for implementing Article 3.2 of the Convention.

Strategy 2.5 is to “Review all existing Ramsar Sites to determine the effectiveness of management arrangements, in line with the Strategic Framework and guidelines for the future development of the List of Wetlands of International Importance”.

Strategy 2.7 concerns management of other internationally important wetlands, and is to achieve “Appropriate management and wise use . . . for those internationally important wetlands that have not yet been formally designated as Ramsar Sites but have been identified through domestic application of the Strategic Framework or an equivalent process”.

The present Handbook therefore provides assistance with a central area of implementation of the Ramsar Convention. The text in this Handbook is drawn mainly from several Resolutions and their Annexes, and the substance of it thus reflects formal decisions adopted by the Conference of Contracting Parties. The Handbook also brings together additional information relevant to this issue. The views expressed in this additional information do not necessarily reflect the views of the Ramsar Secretariat or the Contracting Parties, and such materials have not been endorsed by the Conference of the Parties.

Since this Handbook has been compiled from a suite of guidelines adopted by the Convention at different times and through separate Resolutions, it has been necessary for continuity and clarity in this Handbook to change the numbers of sections, paragraphs, figures, tables, boxes and cross-references from each original set of guidelines as adopted by the Convention. Additions to and omissions from the text of these original guidelines are shown in square brackets [...].

Foreword

The Ramsar Convention recognizes that the designation of Wetlands of International Importance (Ramsar Sites) provides just the starting point for securing the sustainability of wetlands and the maintenance of ecosystem services, and that development and implementation of a management planning process, involving all stakeholders, is necessary to achieve this. Furthermore, such management planning processes can and should be applicable to all wetlands, irrespective of whether they have been Ramsar designated or not. COP5 (1993) adopted *Guidelines on management planning for Ramsar Sites and other wetlands* as the Annex to Resolution 5.7. Subsequently a number of additional tools and guidance relevant to the implementation of management of wetlands have been developed and adopted by the Conferences of the Parties, which together form the integrated package compiled in this Handbook. This includes guidance on describing the ecological character of wetlands, designing a monitoring programme, and wetland management in relation to sustainable fisheries.

In response to Resolution VII.12, which recognized the need for management planning guidance to cover additional aspects of the process, including zonation and buffer zones, and the application of the precautionary approach, the Convention's Scientific and Technical Review Panel (STRP) established a Working Group which reviewed the full package of Convention guidance related to management planning. The STRP concluded that since significant advances had been made in management planning approaches since COP5, a full revision of the COP5 management planning guidelines was necessary. These *New Guidelines for management planning for Ramsar Sites and other wetlands* were adopted by COP8 (Resolution VIII.14), which supersede and expand upon those adopted by COP5.

The New Guidelines recognize that the establishment and implementation of a management plan for a Ramsar site or other wetland is part of an integrated management planning process which helps to decide upon the objectives of site management; identify and describe the management actions required to achieve the objectives; determine the factors that affect, or may affect, the various site features including functions; define monitoring requirements for detecting changes in ecological character and for measuring the effectiveness of management; demonstrate that management is effective and efficient; maintain continuity of effective management; resolve any conflicts of interest; obtain resources for management implementation; enable communication within and between sites, organizations and stakeholders; and ensure compliance with local, national and international policies. They include guidance on integrating site management planning into broad-scale environmental management planning, as well as the requested additional guidance on zonation, and on the precautionary approach. The Guidelines also stress the critical importance of recognizing socio-economic and cultural features and functions of wetlands and of ensuring full stakeholder and local community involvement from the earliest stages of the management planning process. Further guidance on local community and indigenous people's involvement in participatory management is provided in Handbook 7, 4th edition, which should be read in conjunction with this Handbook on wetland management planning.

Important new guidance on issues concerning wetlands and sustainable fisheries, much of it addressing management planning issues, was adopted by COP9 in 2005 as the Annex to Resolution IX.4, and is included as an annex to the integrated package compiled in this handbook.

Updated guidance on describing ecological character was adopted by COP10 (2008) in the Annex to Resolution X.15; and this has also been integrated here.

Readers should note that guidance on impact assessment, formerly included in the 1st edition of this Handbook, is now provided in Handbook 16 of this 4th edition. Readers should also note that the guidance on assessing and reporting change in ecological character, applying the Montreux Record 'tool' of the Convention, and designing restoration programmes, formerly included in the 2nd edition of this Handbook, have now been incorporated in Handbook 19, 4th edition, on *Addressing change in ecological character*. An additional relevant topic is now covered in Handbook 4, 4th edition, which is a new volume on *Avian influenza and wetlands*, incorporating guidance adopted at COP10 on control of and responses to highly pathogenic avian influenza.

Frameworks for managing Wetlands of International Importance and other wetland sites

including Guidelines adopted by the 5th, 6th, 7th, 8th, 9th and 10th meetings of the Conferences of the Contracting Parties

Relevant implementation commitments made by Contracting Parties in COP Resolutions

Resolution 5.7: Management planning for Ramsar Sites and other wetlands

THE CONFERENCE OF THE CONTRACTING PARTIES

CALLS ON Contracting Parties to develop management plans for each wetland designated for the Ramsar List;

REQUESTS Contracting Parties to establish the appropriate legal and administrative structures for the application of such management plans, and to provide funds for the implementation of the plans and for training of the necessary staff.

Resolution VIII.14: New Guidelines for management planning for Ramsar Sites and other wetlands

THE CONFERENCE OF THE CONTRACTING PARTIES

10. STRONGLY URGES Contracting Parties to apply the New Guidelines to establish and implement management planning processes, particularly for those Ramsar Sites within their territory that do not yet have such processes and plans in place;
17. RECOMMENDS that Contracting Parties, when planning the management of Ramsar Sites and other wetlands, should take into account the wider management implications of activities within river basins and other catchments, [...];
20. STRONGLY URGES Contracting Parties to utilize the management planning process and the New Guidelines for management planning for Ramsar Sites and other wetlands to establish for each site on the Ramsar List a monitoring programme, including indicators of ecological character features, and to put into place national mechanisms so as to be informed when the ecological character of a site has changed, is changing, or is likely to change, and FURTHER URGES Contracting Parties to report such matters, without delay, to the Ramsar Bureau in accordance with Article 3.2 of the Convention.

Resolution X.15: Describing the ecological character of wetlands, and data needs and formats for core inventory: harmonized scientific and technical guidance

THE CONFERENCE OF THE CONTRACTING PARTIES

7. INVITES Contracting Parties and those responsible for the management of Ramsar Sites to apply these guidelines in the preparation of ecological character descriptions of Ramsar Sites, and as part of their management planning processes, so that these descriptions constitute a complementary basis to the Information Sheets on Ramsar Wetlands (RIS) for detecting and notifying changes in ecological character, as established through Article 3.2 of the Convention text, and RECOMMENDS that Contracting Parties provide any completed descriptions of the ecological character of Ramsar Sites to the Secretariat as a supplement to the information provided in the RIS.

A. Introduction¹

1. Under the Ramsar Convention on Wetlands the two concepts of wise use and site designation are fully compatible and mutually reinforcing. Contracting Parties are expected to designate sites for the List of Wetlands of International Importance “on account of their international significance in terms of ecology, botany, zoology, limnology or hydrology” (Article 2.2), AND to “formulate and implement their planning so as to promote the conservation of the wetlands included in the List, and as far as possible the wise use of wetlands in their territory” (Article 3.1).
2. Ramsar COP3 (1987) defined wise use of wetlands as “their sustainable utilisation for the benefit of mankind in a way compatible with the maintenance of the natural properties of the ecosystem”. [This definition was updated in 2005 by Resolution IX.1, Annex A, to

“Wise use of wetlands is the maintenance of their ecological character, achieved through the implementation of ecosystem approaches, within the context of sustainable development.”]

See also Handbook 1,
Wise use of wetlands

The Strategic Plan[s adopted at COP6 (1996), COP8 (2002) and COP10 (2008)] equate “wise use” with sustainable use. Contracting Parties to the Convention also recognize that wetlands, through their ecological and hydrological functions, provide invaluable services, products and benefits enjoyed by, and sustaining, human populations. Therefore, the Convention promotes practices that will ensure that all wetlands, and especially those designated for the Ramsar List, will continue to provide these functions and values for future generations as well as for the conservation of biological diversity.

Ramsar Sites and the wise use principle

The act of designating (listing) under the Convention a wetland as internationally important is an appropriate first step along a conservation and sustainable use pathway, the endpoint of which is achieving the long-term wise (sustainable) use of the site.

(from the Annex to Resolution VII.11.)

See also Handbook
19, Addressing
change in wetland
ecological character

3. Article 3.2 of the Convention determines that “each Contracting Party shall arrange to be informed at the earliest possible time if the ecological character of any wetland in its territory and included in the List has changed, is changing or is likely to change”.
4. Contracting Parties are expected to manage their Ramsar Sites so as to maintain the ecological character of each site and, in so doing, retain those essential ecological and hydrological functions which ultimately provide its products, functions and attributes. Ecological character is therefore an indication of the ‘health’ of the wetland and Contracting Parties are expected at the time of designation to describe the site using the approved Ramsar

¹ Note: Paragraphs 1-5 are taken from paragraphs 22-26 of the Annex to Resolution VII.11 Strategic framework and guidelines for the future development of the List of Wetlands of International Importance, now incorporated [and updated] in Handbook [17] of this series.

Information Sheet, in sufficient detail to provide a baseline for subsequent monitoring to detect any changes to these ecological and hydrological attributes (see Section B). Changes to ecological character outside the natural variations may signal that uses of the sites, or externally derived impacts on the sites, are unsustainable and may lead to the degradation of natural processes and thus the ultimate breakdown of the ecological, biological and hydrological functioning of the wetland.

5. The Ramsar Convention has developed tools for monitoring ecological character (see Sections D and E) and also for the development of management plans for Wetlands of International Importance (see Section C) In preparing such management plans, which all Contracting Parties have been strongly urged to do, issues such as the impact of human activities on the ecological character of the wetland, the economic and socio-economic values of the site (especially for local communities), and the cultural values associated with the site need to be considered (see Section C). Contracting Parties have also been strongly encouraged to include within management plans a regime for regular and rigorous monitoring to detect changes to ecological character (Resolution VII.10, see Section D).
6. Figure 1 ([updated] from Ramsar COP7 DOC. 25) presents, in summary form, the integrated package which the Ramsar Convention has developed to assist all Contracting Parties in meeting their obligation to ensure that the ecological character of their designated Wetlands of International Importance is maintained. While developed for this specific purpose, the site management framework can be applied to any wetland site, and all Contracting Parties and local stakeholders are urged to apply these 'tools' for these sites also.
7. In this Handbook the various Sections consider each component of the site management framework in detail, and also provide references to the related decisions by Conferences of the Contracting Parties in this area. These relevant Resolutions and Recommendations are reproduced at the end of this Handbook for ease of reference for the reader.

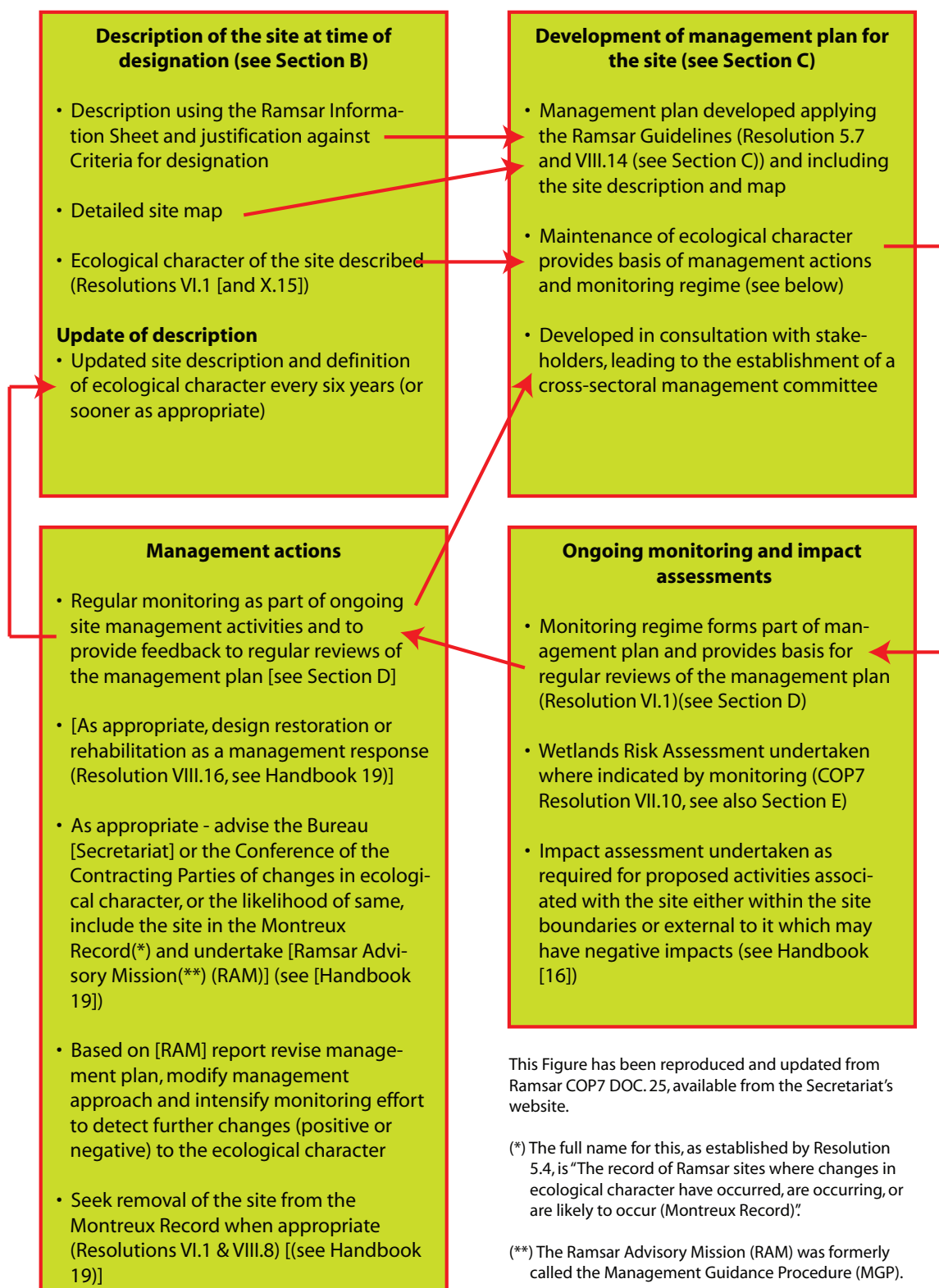
B. Describing the “ecological character” of a wetland

8. As indicated in the previous Section, Article 3.2 of the Ramsar Convention determines that “each Contracting Party shall arrange to be informed at the earliest possible time if the ecological character of any wetland in its territory and included in the List has changed, is changing or is likely to change”.
9. Under the Convention “ecological character” and “change in ecological character” are defined as follows [Note: these terms were originally defined in Resolution VII.10 and were updated by Resolution IX.1 Annex A]:

“Ecological character is the combination of the ecosystem components, processes and benefits²/services that characterise the wetland at a given point in time.”

2 Within this context, ecosystem benefits are defined in accordance with the Millennium Ecosystem Assessment definition of ecosystem services as “the benefits that people receive from ecosystems”.

Figure 1. Summary diagram of the integrated package of Convention tools for the management of Ramsar Sites and other wetlands



And

“For the purposes of implementation of Article 3.2, change in ecological character is the human-induced adverse alteration of any ecosystem component, process, and/or ecosystem benefit/service.”

10. [The following guidelines concerning description of wetland ecological character were adopted by COP6 in 1996 and COP10 in 2008.]
11. [The Annex to Resolution VI.1 includes the following (selected) paragraphs:]
 - i) It is essential that the ecological character of a site be described by the Contracting Party concerned **at the time of designation for the Ramsar List**, by completion of an Information Sheet on Ramsar Wetlands (as adopted by Recommendation 4.7 [and subsequently modified to that given in Handbook 17]).
 - ii) Sources of information which might be consulted by Contracting Parties in describing the ecological character of listed sites include international, national and regional scientific inventories of wetlands; already existing site-specific management plans; and other site-specific scientific surveys or reports.
 - iii) Contracting Parties are requested to verify the data which they have provided on Information Sheets on Ramsar Wetlands every six years (i.e. every second meeting of the Conference) and to provide the [Secretariat] with updated sheets if necessary. During the intervening period, urgent information on changes at listed sites should be conveyed to the Bureau using the existing mechanisms of regular, day to day contacts and the triennial National Reports. [For further guidance on addressing change in wetland ecological character, see Handbook 19]. . . .
 - iv) It is recognized that, for many sites, such information [the baseline data needed to allow changes in ecological character to be detected] will not be known at present, nor be readily available. The [Ramsar Information] sheets will also only provide a snap-shot in time. However, the level of information in the Information Sheet on Ramsar Wetlands is the minimum necessary for determining management steps to maintain the ecological character of a listed site. In gathering new data or assembling existing data, Contracting Parties should give emphasis to sites where there appears to be a high-medium risk of human-induced change with a high-medium ecological impact, likely to result in permanent, long- or medium-term degradation of values and benefits. International technical and/or financial cooperation may be needed to assist in gathering information about listed sites, particularly in developing countries.
12. [At COP7, the STRP reported that the Ramsar Information Sheet (RIS) does not provide a sufficiently detailed and rigorous description of “ecological character”. In the 3rd edition of this Handbook, Contracting Parties were urged to consider carefully the definitions of “ecological character” and “change in ecological character” and, at the time of designation, to supplement the RIS with appropriate higher resolution benchmark data. The Convention’s Scientific and Technical Review Panel (STRP) were asked

to prepare further guidance for making a detailed description of ecological character, and this subsequently formed the basis for Resolution X.15, on *Describing the ecological character of wetlands, and data needs and formats for core inventory: harmonized scientific and technical guidance*, which the Parties adopted at COP10 in 2008. The Annex to this Resolution provides a “Ramsar ecological character description sheet” (see box below) and provides guidance on its completion, including the following (selected) paragraphs:

- i) [...] in many instances the data and information categories required are the same for [the] different purposes [of core inventory, ecological character description, site designation with the Ramsar Information Sheet, and reporting change under Article 3.2 of the Convention], and hence the main effort of data collation need only be undertaken once, rather than being duplicated. Any differences in the data and information needs for these various purposes can often be more a matter of the level of detail required. Actual needs will vary according to the individual circumstances of the sites and situations concerned. The tables [in the Annex to Resolution X.15] identify the full list of fields that may apply, but whether any of them does apply, or whether there is capacity to provide a full description, will vary from site to site. It is not expected that all the specific data fields will necessarily have to be filled out for all sites.
- ii) **Start with available data and information.** In developing a description of the ecological character of a wetland, it is important to start with whatever data and information are currently available, even if information is not comprehensively available for all fields in the description sheet. Starting with compiling what is currently available also helps to identify gaps and priorities for further data and information collection to enhance the description.
- iii) **Start with qualitative description if quantitative data are not available.** Even if detailed quantitative data are not available, begin by compiling qualitative data and information and do not underestimate the value of expert and local knowledge as a source of such information. Often, bringing together those who know the wetland to share their knowledge can be an important and effective start to compiling the ecological character description.
- iv) **Simple ‘conceptual models’ can be a powerful tool.** Developing simple two- or three-dimensional ‘conceptual models’ accompanied by summary descriptions of key features, processes and functioning can be a powerful tool supporting the ecological character description. Further guidance on approaches to developing such conceptual models will be developed by the Scientific and Technical Review Panel. For one example of this approach for a Ramsar site, see Davis, J. & Brock, M. (2008) “Detecting unacceptable change in the ecological character of Ramsar Wetlands,” *Ecological Management & Restoration*, vol. 9 (1): 26-32 (downloadable from <http://www.blackwell-synergy.com/doi/pdf/10.1111/j.1442-8903.2008.00384.x>).
- v) **Separate descriptions for different parts of large or complex wetlands can be a helpful start.** For large wetlands or wetland complexes where different parts of the system function differently or have very different

characteristics, it may prove practically helpful to prepare separate descriptions initially for any distinctly different parts, supplemented by an overall summary ecological character description and conceptual models.]

Ramsar ecological character description sheet

(adopted as the Annex to Resolution X.15)

Note: The bracketed codes (P), (R), (C) and (S) refer to the categorization of ecosystem services provided by the Millennium Ecosystem Assessment (MA), as follows: “provisioning” (P), “regulating” (R), cultural (C) or “supporting” (S)

Ramsar ecological character description sheet		
Site name: Official name of site and catchment)/other identifier(s) (e.g., reference number)		
1. Summary statement		
		Change/likely change?
<p>Two or three narrative sentences giving a statement of what is ecologically <i>distinctive</i> (not necessarily <i>important</i>) about the site, based on the details below. (With reference to the COP 9 definition, this concerns <i>the combination</i> of the components, processes and services that <i>characterise</i> the wetland (emphasis added)).</p> <p>Note. Supplementing the summary statement with simple conceptual models of the key characteristics of the wetland is encouraged.</p>		[include here a brief summary narrative of the overall changes to components, processes and services that characterises the wetland, as detailed below]
2. Ecological components		
		Change/likely change?
2.1 Geomorphic setting: Setting in the landscape/catchment/river basin - including altitude, upper/lower zone of catchment, distance to coast where relevant, etc.		
2.2 Climate: Overview of prevailing climate type, zone and major features (precipitation, temperature, wind)		
2.3 Habitat types (including comments on particular rarity, etc.) and Ramsar wetland types		
2.4 Habitat connectivity		
2.5 Area, boundary and dimensions: Site shape (cross-section and plan view), boundaries, area, area of water/wet area (seasonal max/min where relevant), length, width, depth (seasonal max/min where relevant)		

2.6 Plant communities, vegetation zones and structure (including comments on particular rarity, etc.)		
2.7 Animal communities (including comments on particular rarity, etc.)		
2.8 Main species present (including comments on particular rare/endangered species etc.); population size and proportion where known, seasonality of occurrence, and approximate position in distribution range (e.g., whether near centre or edge of range)		
2.9 Soil: Geology, soils and substrates, and soil biology		
2.10 Water regime: Water source (surface and groundwater), inflow/outflow, evaporation, flooding frequency, seasonality and duration; magnitude of flow and/or tidal regime, links with groundwater		
2.11 Connectivity of surface waters and of groundwater		
2.12 Stratification and mixing regime		
2.13 Sediment regime (erosion, accretion, transport and deposition of sediments)		
2.14 Water turbidity and colour		
2.15 Light - reaching the wetland (openness or shading); and attenuation in water		
2.16 Water temperature		
2.17 Water pH		
2.18 Water salinity		
2.19 Dissolved gases in water		
2.20 Dissolved or suspended nutrients in water		
2.21 Dissolved organic carbon		
2.22 Redox potential of water and sediments		
2.23 Water conductivity		
3. Ecological processes		
		Change/likely change?
3.1 Primary production (S)		
3.2 Nutrient cycling (S)		
3.3 Carbon cycling		
3.4 Animal reproductive productivity		
3.5 Vegetational productivity, pollination, regeneration processes, succession, role of fire, etc.		
3.6 Notable species interactions , including grazing, predation, competition, diseases and pathogens		
3.7 Notable aspects concerning animal and plant dispersal		
3.8 Notable aspects concerning migration		
3.9 Pressures, vulnerabilities and trends concerning any of the above, and/or concerning ecosystem integrity		

4. Ecosystem services		Change/likely change?
4.1 Drinking water for humans and/or livestock (P)		
4.2 Water for irrigated agriculture (P)		
4.3 Water for industry (P)		
4.4 Groundwater replenishment (R)		
4.5 Water purification/waste treatment or dilution (R)		
4.6 Food for humans (P)		
4.7 Food for livestock (P)		
4.8 Wood, reed, fibre and peat (P)		
4.9 Medicinal products (P)		
4.10 Biological control agents for pests/diseases (R)		
4.11 Other products and resources, including genetic material (P)		
4.12 Flood control, flood storage (R)		
4.13 Soil, sediment and nutrient retention (R)		
4.14 Coastal shoreline and river bank stabilization and storm protection (R)		
4.15 Other hydrological services (R)		
4.16 Local climate regulation/buffering of change (R)		
4.17 Carbon storage/sequestration (R)		
4.18 Recreational hunting and fishing (C)		
4.19 Water sports (C)		
4.20 Nature study pursuits (C)		
4.21 Other recreation and tourism (C)		
4.22 Educational values (C)		
4.23 Cultural heritage (C)		
4.24 Contemporary cultural significance, including for arts and creative inspiration, and including existence values (C)		
4.25 Aesthetic and "sense of place" values (C)		
4.26 Spiritual and religious values (C)		
4.27 Important knowledge systems, and importance for research (C)		
(Note. For nature conservation value as an ecosystem 'service' (S), see items under 'components' and 'processes' above)		

C. Developing a management planning process

- The analysis of the National Reports submitted to COP7 (reviewed in Ramsar COP7 DOC.13.3 and available from the Bureau's Web site at [http://www.ramsar.org/cda/ramsar/display/main/main.jsp?zn=ramsar&cp=1-31-58-83^19200_4000_0__]) indicated that management plans were in place for 168 Ramsar Sites (18% of the total List) and plans were being prepared or reviewed for a further 248 sites (26%). A regional analysis

revealed considerable activity in preparing or updating management plans in the eastern part of Europe, the Neotropics, North America and Oceania but noticeably less in Africa, Asia and the western part of Europe. While it was encouraging to note that “plans including monitoring” were underway in 22% (North America) up to 52% (Neotropics) of sites in the various Ramsar regions, much [still] remains to be done to reach the target set by Action 5.2.3 of the Strategic Plan of the Convention (1997-2002). This states that “by the 8th COP (2002), management plans or other mechanisms” should be “in preparation, or in place, for at least half of the Ramsar Sites in each Contracting Party”.

14. National Reports submitted to COP8 (reviewed in Ramsar COP8 DOC. 5 and available from the Bureau’s Web site at[http://www.ramsar.org/cda/ramsar/display/main/main.jsp?zn=ramsar&cp=1-31-58-128^17782_4000_0__]) indicate some further progress in management planning for Ramsar Sites, with at least 553 sites with management plans, 397 of these being fully implemented. Only 24 Parties (20%), however, reported having management plans in place for all Ramsar Sites.
15. The Annex to Resolution VIII.14 (see “Relevant Resolutions and Recommendations” for the Resolution itself), adopted by Ramsar COP8, provides Contracting Parties with *New Guidelines for management planning for Ramsar Sites and other wetlands*. These are reproduced here in paragraphs 16-189 although readers should note that the paragraph numbers reflect the current document and not those of the original Annex to the Resolution.

New Guidelines for management planning for Ramsar Sites and other wetlands

[from the Annex to Resolution VIII.14]

I. Introduction

16. These Guidelines replace the Ramsar *Guidelines on management planning for Ramsar Sites and other wetlands* adopted by Resolution 5.7 of COP5 in 1993 and published in the 1st edition of Ramsar Handbook 8 (January 2000). They provide additional guidance on environmental, social and economic impact assessment and cost-benefit analysis, zonation and multiple use, design and maintenance of buffer zones, and the application of the precautionary approach.
17. The guidelines are relevant to the requirements of the Convention concerning the conservation of wetlands included in the List of Wetlands of International Importance and the wise use of all wetlands in the territory of Contracting Parties (Article 3 of the Convention), as well as the establishment of nature reserves (protected areas) at wetlands, whether or not they are included in the Ramsar List (Article 4.1).
18. These guidelines focus on the site-based scale of management planning. It is recognized, however, that designated Ramsar Sites include a wide range of different applications of ‘site’ since they range in size from less than 1 hectare to over 6 million hectares, and that whilst some have boundaries delimiting just a discrete wetland area, others include surrounding non-wetland buffer zones, habitat mosaics, or catchment areas within their boundaries. It is therefore recognized that the application of these guidelines

will need to be flexible, depending upon the particular characteristics and circumstances of each Ramsar site or other wetland.

19. Ramsar site management plans should be integrated into the public development planning system at local, regional or national level. The integration of site management plans into spatial and economic planning at the appropriate level will ensure implementation, public participation and local ownership. Furthermore, integration will enhance the possibility of local as well as external funding.
20. The guidelines also recognize that site-based management planning should be one element of a multi-scalar approach to wise use planning and management and should be linked with broad-scale landscape and ecosystem planning, including at the integrated river basin and coastal zone scales, because policy and planning decisions at these scales will affect the conservation and wise use of wetland sites.
21. These new guidelines place further emphasis on the role of a management plan as part of an overall management planning process and provide additional advice on incorporating good practice in management planning, including adaptable management, outcomes, quantified objectives, and integrated monitoring.

II. General guidelines

22. Wetlands are dynamic areas, open to influence from natural and human factors. In order to maintain their biological diversity and productivity (i.e., their 'ecological character' as defined by the Convention³), and to permit the wise use of their resources by people, an overall agreement is essential between the various managers, owners, occupiers and other stakeholders. The management planning process provides the mechanism to achieve this agreement.
23. The management plan itself should be a technical document, though it may be appropriate for it to be supported by legislation and in some circumstances to be adopted as a legal document.
24. The management plan is part of a dynamic and continuing management planning process. The plan should be kept under review and adjusted to take into account the monitoring process, changing priorities, and emerging issues.
25. An authority should be appointed to implement the management planning process, and this authority should be clearly identified to all stakeholders. This is particularly important on a large site where there is a need to take account of all interests, users, and pressures on the wetland, in a complex ownership and management situation.
26. Although conditions vary at individual wetlands, these guidelines may be applied worldwide. The guidelines provide a conceptual background to, and framework for, wetland management planning and an outline of the main sections of a management plan. It is emphasized that the guidelines do not

3 ["**Ecological character** is the combination of the ecosystem components, processes and benefits/services that characterise the wetland at a given point in time." (Resolution IX.1 Annex A).]

Additional information

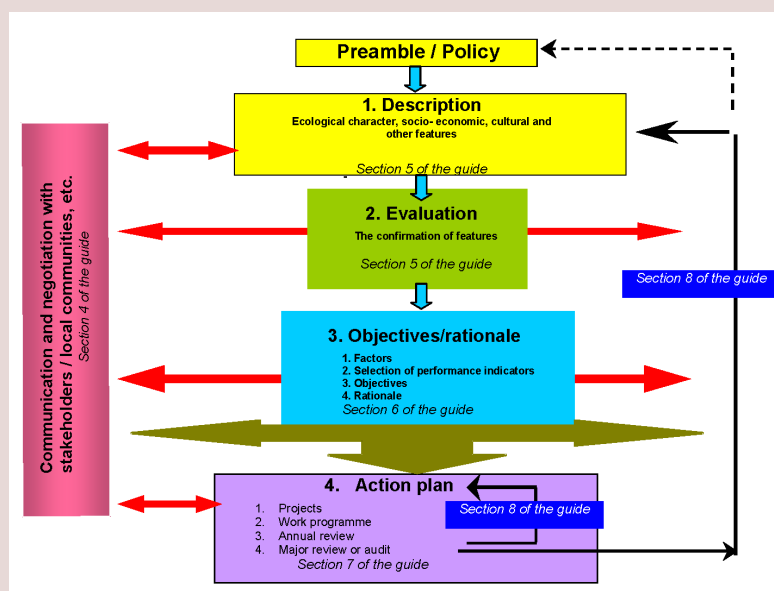
Wetland management planning: a guide for site managers

Designed to complement the Ramsar management planning guidelines adopted by Resolution VIII.14, this guide has been developed by WWF in association with Ramsar's Scientific & Technical Review Panel (STRP) in response to a request by Ramsar COP8 for the preparation of a simple "field guide" to wetland management planning. *Wetland management planning: a guide for site managers* provides those responsible for on-the-ground management of Ramsar Sites and other wetlands with a simple *aide memoire* summary of key issues and activities to remember and apply in the various different stages of the management planning process.

The guide is arranged in a series of colour-coded sections designed to facilitate easy look-up when a manager is dealing with a particular aspect of the process. The guide is organized in the following sections:

1. Introduction
2. The need for management planning
3. Essentials of management planning
4. Successful wetland management planning
5. Knowing the wetland and its values
6. Setting management objectives
7. Achieving management objectives
8. Closing the planning loop

An overview diagram shows how each of these sections relates to the more detailed guidance provided in Resolution VIII.14 and this Handbook:



The guide is supplemented with several case studies of successful wetland management planning activities in different parts of the world. It [was published in 2008 and is available to download from http://assets.panda.org/downloads/wetlands_management_guide_2008.pdf].

provide a prescription for the detailed contents of a complete management plan itself, which will be a much more detailed document and should be prepared at regional or local level.

27. A management plan, and the management planning process, should only be as large or complex as the site requires. The production of a large, elaborate and expensive plan will not be possible, and certainly not justifiable, for many sites. The size of a plan, and (perhaps more importantly) the resources made available for its production, must be in proportion to the size and complexity of the site, and also to the total resources available for the safeguarding and/or management of the site. Thus for small uncomplicated sites, brief, concise plans will suffice. For large or zoned sites, it may be appropriate to develop separate detailed plans for different sections of the site, within an overall statement of objectives for the whole site.
28. Often management planning should not be restricted to the defined site boundary, but rather should also take into account the wider context of planning and management, notably in the basin or coastal zone within which the site is located, which can be transboundary in nature. It is important to ensure that the site planning takes into account the external natural and human-induced factors and their influence on the site, and also to ensure that the management objectives for a site are taken into account in the wider planning processes. For further guidance see Ramsar's *Guidelines for integrating wetland conservation and wise use into river basin management* (Ramsar Handbook [9]); the *Principles and guidelines for incorporating wetland issues into integrated coastal zone management (ICZM)* (Ramsar Handbook [12]); and *Guidelines for international cooperation under the Ramsar Convention on Wetlands* (Ramsar Handbook [20]) concerning transboundary wetlands. The link between site-based and wider-scale management is further elaborated in the following Section.

III. Integrating wetland site management within broad-scale environmental management planning, including river basin and coastal zone management

See also Handbooks 9, River basin management; 10, Water allocation and management; and 12, Coastal management

29. It is the permanent presence of water in wetlands, or at least for some significant period of time, that creates the soils, micro-organisms, and plant and animal communities such that the land functions in a different way from terrestrial habitats. Wetland ecosystems are adapted to the hydrological regime and are vulnerable to change. For most wetlands, direct rainfall provides only a small proportion of the water regime, with the primary source being rivers or aquifers. Similarly, wetlands in the coastal zone are influenced by the quantity and quality of freshwater flowing into them from rivers and other land-based discharges and of oceanic and marine waters from further offshore.
30. Successful management of wetland sites therefore requires maintenance of these sources of water. The inter-connectedness of the hydrological cycle means that changes some distance from the wetland can have a detrimental impact. Insufficient water reaching wetlands, due to climate change, land use change, abstractions, storage and diversion of water for public supply, agriculture, industry and hydropower, are all major causes of wetland loss and degradation. A key requirement for wetland conservation and wise use

is to ensure that adequate water of the right quality is allocated to wetlands at the right time. For further information, see the *Guidelines for the allocation and management of water for maintaining the ecological functions of wetlands* (Resolution VIII.1,[incorporated in Handbook 10]).

31. The fundamental unit for water issues is normally the river basin (or catchment), as this demarcates a hydrological system in which components and processes are linked by water movement. The river basin will normally include a mosaic of different land types, including wetlands, forests, grasslands, agricultural and urban areas. The term 'integrated river basin management' (IRBM) has developed into a broad concept that takes a holistic approach (see Ramsar Wise Use Handbook [9], *Integrating wetland conservation and wise use into river basin management*).
32. However, it is important to recognize that in some cases the river basin within which the wetland lies may not be the most appropriate unit for wider-scale planning. This is when groundwater plays a significant role in supplying water to a wetland, since the underlying aquifer does not always coincide with the surface river basin. If this is the case, more than one basin overlying the aquifer may constitute the appropriate unit of water resource management. It is therefore important to establish the hydrological relationships between the wetland and its sources of surface and ground water as the basis for appropriate site-based management planning.
33. Integrated River Basin Management is complementary to Integrated Water Resource Management (IWRM), which has come to the fore as a strategy proposed in Chapter 18 of Agenda 21 to implement the Dublin Principles⁴. Agenda 21 affirms that "Such integration must cover all types of interrelated freshwater bodies, including both surface water and groundwater, and duly consider water quantity and quality aspects. The multisectoral nature of water resources development in the context of socio-economic development must be recognized, as well as the multi-interest utilization of water resources for water supply and sanitation, agriculture, industry, urban development, hydropower generation, inland fisheries, transportation, recreation, low and flat lands management and other activities."
34. A key element of IWRM is that river basins are usually the most appropriate physical entity in which to plan the management of water. The concept of Ecosystem Management has broad similarities with IRBM, where the ecosystem boundary is synonymous with the river basin boundary, but in which the focus is on maintaining ecosystem functioning.
35. The aim of Integrated River Basin Management or Integrated Water Resource Management is to bring together stakeholders at all levels, from politicians to local communities, and to consider water demands for different sectors within the basin⁵. Achieving adequate allocation of water to wetlands requires that the water needs of the wetland, including those in the estuary and coast, are defined and communicated to other stakeholders. It is also essential that the benefits of wetlands, such as their hydrological

4 The Dublin Principles were adopted by the 1992 Dublin International Conference on Water and the Environment.

5 See Ramsar Wise Use Handbook [9], *Integrating wetland conservation and wise use into river basin management*.

and ecological functions and their provision of goods and services, are determined in order to justify the required allocation.

36. The ease with which adequate water allocation for wetlands can be achieved will depend upon the legislative drivers. Some states will have legislation regarding allocation of water to the environment, such as South Africa's Water Law or the European Union's Habitats Directive and Water Framework Directive. In these cases, procedures may be in place to allocate sufficient water for wetlands.
37. In other cases, water allocation will be made on the basis of the benefits that water use will bring. Other stakeholders with competing water allocation requirements will include representatives of public water supply, energy, agricultural and industrial communities. All will have powerful arguments to justify their water requirements in terms of public health, food, and economic output, including employment.
38. Consequently, achieving water allocation for wetlands will often be a long process that needs careful planning and will include training and awareness-building about the benefits of wetlands. These benefits need to be presented in a manner in which the trade-offs with other water users can be evaluated. Some benefits, such as fisheries, can be given a monetary value that fits into a traditional financial analysis, but this is generally not the case for social, cultural and ecological benefits⁶. A framework for decision-making needs to be established, such as multi-criteria analysis, that allows evaluation of all social, cultural and ecological values of wetlands as well as their economic values.
39. To implement IRBM, many countries (or groups of countries that share a river basin) have established river basin management authorities or commissions, such as those for the Niger, Mekong, and Zambezi Rivers and Lake Chad Basin. However, many river basin authorities and water agencies have as yet insufficient appreciation of the benefits provided by wetlands in terms of their productivity, e.g. fisheries and livestock grazing, and their social importance, e.g. their traditional usage by local communities and indigenous peoples or their cultural heritage. Indeed, many perceive wetlands only as competing users of water, with high evaporative demand. It is vital that river basin planners and managers recognize that wetland ecosystems are key elements within a basin and are the resource from which the commodity of water is derived, rather than only a competing user of water. Thus judicious management of wetlands, such as use of wetlands to improve water quality, can be a solution to IRBM rather than a restriction.
40. IRBM can be seen as an opportunity to promote the wise use of wetlands since it establishes a forum for dialogue where the benefits of wetlands can be demonstrated. It also provides an opportunity to question the wisdom of proposed infrastructure developments, such as dams, that might have a negative impact on wetlands⁷ (see also Resolution VIII.2, *The report of the World Commission on Dams (WCD) and its relevance to the Ramsar Convention*).

6 Barbier, E., Acreman, M.C. & Knowler, D. 1997. *Economic valuation of wetlands: a guide for policy makers and planners*. Ramsar Convention, Gland, Switzerland.

7 *Dams and development: a new framework for decision-making*. Report of the World Commission on Dams, Cape Town, South Africa, 2000

41. Where river basin authorities or similar bodies are not already in place, it will be necessary to initiate a process for defining water allocation, which will include creation of a forum for stakeholder interaction⁸.
42. In developing a management planning process for a wetland site, it is important that wetland managers take into account the wider context of basin-scale, aquifer or coastal zone management processes for the region in which their wetland occurs, and interact with these processes so as to ensure that the needs of the wetland are recognized and fully incorporated in this wider planning and management.

IV. The functions of wetland management planning

43. The most important functions of a wetland management planning process and a management plan are:

Function I. To identify the objectives of site management

This is the single most important function of the planning process. It is essential that management objectives be defined for each important feature of the ecological character of the site and for all other important features related to the functions and values of the site, including socio-economic, cultural and educational values. In other words, those responsible for developing the management plan must be clear about what they are trying to achieve.

Function II. To identify the factors that affect, or may affect, the features

The ability to achieve wise use and conservation objectives for wetlands will always be influenced to some extent by a number of factors, including trends, constraints and obligations, in fact anything that has influenced, is influencing, or may influence the features of the site for which objectives are set. It is essential that all the important factors should be identified, and that their impact on the site, particularly on the features of its ecological character, be considered. For the most significant factors, it may be necessary to undertake Environmental Impact Assessments (EIA) as part of the planning process.

Function III. To resolve conflicts

On most sites there will be some conflicts of interest and difficulty in identifying priorities. It is essential that the planning process should be recognized as a forum for resolving conflicts and establishing commitments for the future.

Function IV. To define the monitoring requirements

A function of monitoring, in the context of management planning, is to measure the effectiveness of management. It is essential to know, and to be able to demonstrate to others, that the objectives are being achieved. Thus, monitoring must be recognized as an integral component of management

⁸ See Resolution VIII.1, *Guidelines for the allocation and management of water for maintaining the ecological functions of wetlands*.

and planning. It should be designed to identify and manage change in ecological character of the site⁹.

Function V. To identify and describe the management required to achieve the objectives

In most cases where habitats or species require safeguarding, some action, i.e. management, will be necessary. Having established that a plan identifies the objectives of management, it follows that it must also identify, describe, and estimate the cost of the action required.

Function VI. To maintain continuity of effective management

Continuity of effective management and monitoring is essential. Management processes must be adapted to meet a wide range of varying factors. Although management will change as circumstances require, the purpose of management should remain more or less constant. This is why continuity of effective management must be maintained, and not simply the continuity of any specified process. Continuity of monitoring is as important as is continuity of management.

Function VII. To obtain resources

Management planning must identify and quantify the resources required to manage a site, and this should include the preparation of a detailed budget. This information can then be used to support and justify bids for resources. It is often difficult, particularly in developing countries, to allocate funds for the implementation of management plans, but it is essential that the management plan identify mechanisms for financing management. These mechanisms may include generating income on the site, for example, through tourism, harvesting of reeds, fishing, etc., and/or the establishment of a Trust Fund for the site or other long-term funding mechanism. In many cases it may be necessary to assess the capacity of the organization responsible for implementing the management plan at an early stage in its preparation. Shortfalls identified in the capacity assessment should be addressed in the Action Plan section (see Section XVII of these guidelines).

Function VIII. To enable communication within and between sites, organizations and stakeholders

Communication is essential within organizations, and also between organizations and individuals. Management plans and the management planning process are a means of presenting information in a structured and accessible format that will inform others about the site, the aims of management, and the management processes. Planning and management for the maintenance of ecological character are largely dependent on the availability of information. It is also important that those responsible for developing the plan should be aware of management techniques and procedures developed or improved elsewhere. The communications, education and public awareness (CEPA) components of the plan from its

See also Handbook 6,
Wetland CEPA

⁹ ["For the purposes of implementation of Article 3.2, **change in ecological character** is the human-induced adverse alteration of any ecosystem component, process, and/or ecosystem benefit/service." (Resolution IX.1 Annex A)]

inception to full implementation should be clearly defined (see Resolution VIII.31).

Function IX. To demonstrate that management is effective and efficient

Those responsible for developing the plan must always be in a position to demonstrate that they are making the best use of resources and that management will be effective. In other words, the plan should provide the basis for any cost benefit analysis. It is also important that the need for accountability is recognized.

Function X. To ensure compliance with local, national, and international policies

See also Handbook
2, National Wetland
Policies

It is essential that the management plan recognizes and is compliant with a wide range of policies, strategies, and legislation. Occasionally policies may be contradictory, and consequently one of the functions of a plan must be to integrate the various policies. A National Wetland Policy and related national biodiversity plans and policies provide the context and framework for the development of a site management plan (see Ramsar Handbook no. 2, *Guidelines for developing and implementing National Wetland Policies*, for further guidance). In particular the plan should contribute to the implementation of the National Wetland Policy and/or national biodiversity strategy and other related plans and policies.

V. Stakeholders, including local communities and indigenous people

44. Wetland management, and particularly the planning process, should be as inclusive as possible. Legitimate stakeholders, particularly local communities and indigenous people, should be strongly encouraged to take an active role in planning and in the joint management of sites. It is highly desirable that positive steps be taken to ensure that gender issues, including women and their interests, are fully taken into account at all stages in the process. If necessary, appropriate incentives to ensure full stakeholder participation should be identified and applied. Further guidance on involving local communities and indigenous peoples in the participatory management of wetlands is contained in the guidelines adopted by Ramsar Resolution VII.8 (Ramsar Wise Use Handbook [7]).
45. A 'stakeholder' is taken to mean any individual, group or community living within the influence of the site, and any individual, group or community likely to influence the management of the site. This will obviously include all those dependent on the site for their livelihood.
46. Stakeholder interests can have considerable implications for site management, and will place significant obligations on managers. Public interest, at all levels, must be taken into account. Wetland managers must recognize that other people may have different, and sometimes opposing, interests in the site. It is essential that these interests be safeguarded wherever possible, but this must not be to the detriment of the features of the ecological character of the site. Any use of the site must ultimately meet the test of compatibility with the wise use and conservation purpose

and objectives, and this is of added significance where the site has been designated as a Wetland of International Importance.

See also Handbook 7,
Participatory skills

47. The involvement and understanding of local communities and indigenous peoples in the management of wetlands is of particular importance where the wetland is under private ownership or in customary tenure, since then the local communities are themselves the custodians and managers of the site, and in these circumstances it is vital that the management planning process is not seen as one imposed from outside upon those who depend on the wetland for their livelihoods.

Consultation with, and participation by, stakeholders

48. It is particularly important that stakeholders be informed at the earliest possible stage about an intention to produce a management plan, but at this stage this should not be confused with formal negotiation. The most important early message is that everyone will be consulted and involved and that all interests will be given proper consideration. Management planners must convey the message that they are open-minded and will deal as objectively as possible with all issues. Relevant stakeholders should include not only local communities but also local government (including all sectors whose decisions can affect the management planning process and its objectives) and the private sector.
49. Consultation and negotiation should be about presenting ideas or proposals for discussion and seeking views about specific issues. A structured planning process should generate ideas and proposals – unfocused discussion is rarely conclusive and can be counterproductive. Before any consultation, managers must know what they are attempting to achieve, and should define those areas that are open to negotiation. For issues that are open to discussion, a range of well-considered options should be given. Every effort must be made to be inclusive and to achieve consensus, supporting the wise use of resources without compromising the natural integrity of the unit. In some cases, especially when management is not the direct responsibility of local communities or indigenous peoples, the process will be ‘citizen-assisted’ rather than ‘citizen-driven’, because management decisions will ultimately rest with the responsible agency.
50. Before embarking upon a plan, it will be necessary to collect or collate all available relevant information about the site in order to describe its ecological character and its functions and values, including all relevant socio-economic, cultural and educational features. Professionals in the natural and social sciences should be involved to ensure effective collection of all relevant data. Local people and other stakeholders are usually an important source of information, and they should be involved through appropriate and proven techniques that are sensitive, *inter alia*, to gender and cultural issues, in the data and information collation stage of the process.
51. Once data collation and the preparation of the descriptive sections of the plan are complete, the process moves on to preparing management objectives concerning the maintenance of the ecological character and other aspects of interests to stakeholders. The protection of the features of the ecological character is the prime concern for a Ramsar site, and should not

be considered negotiable. However, it is important to bear in mind that these features are very often present because they are, and will need to be, maintained by local people. It is very important when introducing the concepts of designation and management planning to stakeholders that they do not gain the impression that the process will curtail legitimate activities, unless such activities could threaten important features or are potentially unsustainable.

52. Once the obligations are known, planners can then move on to identify the management requirement. At this stage, negotiation with stakeholders becomes essential. While the objectives concerning the maintenance of the ecological character should not be negotiable, it is often possible to identify a range of alternative management approaches that would meet them whilst at the same time assisting in achieving other objectives of interest to different stakeholders.
53. Finally, management plans should be regarded as public documents, and all stakeholders should be given access to the plan.

VI. The precautionary approach as applied to environmental management

54. When considering the carrying capacity of a site for any human use, activity or exploitation (i.e., its sustainability), the best available evidence should indicate that the activity will not be a threat to the features of the ecological character of the site.
55. Contracting Parties are, when implementing their wetland management planning process, invited to take into consideration the precautionary approach, as established in Principle 15 of the 1992 Rio Declaration on Environment and Development adopted by the United Nations Conference on Environment and Development (UNCED), which affirms that

“In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.”

VII. Management planning is a process

56. Management planning must be regarded as a continuous, long-term process. It is important to recognize that a management plan will grow as information becomes available. Planning should begin by producing a minimal plan that meets, as far as resources allow, the requirements of the site and of the organization responsible for managing the site, and no more.
57. All available information should be collated and assessed (see paragraph 50 above). Any shortfall of relevant information must be recorded, and projects should be planned to correct this deficiency. In time, as further information is collected and resources become available, the plan can grow, and may eventually meet all site management requirements.

58. The planning process is adaptable and dynamic. It is essential that the plan change, or evolve, to meet changing features, factors and priorities, both within and outside the site.
59. The overall management planning process for Ramsar Sites and other wetlands is supported by the substantial range of the Convention's tools and guidances compiled in the Ramsar Wise Use Handbooks. Of particular relevance to the different stages of the management planning process are:

Identification and designation of wetlands

- Definitions of "ecological character" and "change in ecological character" ([in Resolution IX.1 Annex A] [Handbook 1]
An Integrated Framework for wetland inventory, assessment and monitoring (IF-WIAM) (Resolution IX.1 Annex E) [Handbook 13]
A Framework for Wetland Inventory (Resolution VIII.6) [Handbook 15]
Enhancing the information on Wetlands of International Importance (Ramsar Sites) (Resolution VIII.13)
Revised Strategic Framework and guidelines for the future development of the List of Wetlands of International Importance (Annex B, Resolution IX.1) [Handbook 17]

Wetland assessment

- An Integrated Framework for wetland inventory, assessment and monitoring (IF-WIAM)* (Resolution IX.1 Annex E) [Handbook 13]
Wetland risk assessment framework (Resolution VII.10) [this Handbook]
'Guidelines for incorporating biodiversity related issues into environmental impact assessment legislation and/or processes in strategic environmental assessment' adopted by the Convention on Biological Diversity (CBD), and their relevance to the Ramsar Convention (Resolution VIII.9) [Handbook 16]
Gaps and harmonization of Ramsar guidance on wetland ecological character, inventory, assessment and monitoring (Resolution VIII.7)
Guidelines for the rapid assessment of inland, coastal and marine wetland biodiversity (Resolution IX.1, Annex Ei) [*Ramsar Technical Report 1*]

Wetland monitoring

- A Framework for designing a wetland monitoring programme* (Annex to Resolution VI.1) [this Handbook]
[*A Framework for processes of detecting, reporting and responding to change in wetland ecological character* (Resolution X.16; Handbook 19)]

In situ Wetland management

- New Guidelines for management planning for Ramsar Sites and other wetlands* (Resolution VIII.14) [this Handbook]
Guidelines for establishing and strengthening local communities' and indigenous people's participation in the management of wetlands (Resolution VII.8) [Handbook 7]
Participatory Environmental Management (PEM) as a tool for management and wise use of wetlands (Resolution VIII.36)
Guiding principles for taking into account the cultural values of wetlands for the effective management of sites (Resolution VIII.19) [this Handbook, Appendix I]
[*Guidance on responding to the continued spread of highly pathogenic avian influenza* (Resolution X.21; Handbook 4)]

Ex situ Wetland management

- An Integrated Framework for the Ramsar Convention's water-related guidance* (Resolution IX.1, Annex C) [Handbook 8]

- Guidelines for integrating wetland conservation and wise use into river basin management* (Resolution VII.18 [& Resolution IX.1 Annex C i]) [Handbook 9]
Guidelines for the allocation and management of water for maintaining the ecological functions of wetlands (Resolution VIII.1) [Handbook 10]
[Guidelines for the management of groundwater to maintain wetland ecological character (Resolution IX.1 Annex C ii) [Handbook 11]]
Principles and guidelines for integrating wetlands into Integrated Coastal Zone Management (Resolution VIII.4) [Handbook 12]
The Report of the World Commission on Dams (WCD) and its relevance to the Ramsar Convention (Resolution VIII.2)
The Ramsar Convention and conservation, production and sustainable use of fisheries resources (Resolution IX.4) [this Handbook, Appendix II]

VIII. Inputs, outputs, and outcomes

60. Managers must differentiate between inputs, outputs and outcomes.

Inputs	=	Resources
Outputs	=	Policies, management plans, management
Outcomes	=	Condition of the features of the ecological character of the site and other management objectives

61. These terms are defined as:
- i) **Inputs.** The resources provided for site management, for example, finance, staff and equipment.
 - ii) **Outputs.** The consequential by-products of management or the management planning process. For example, policies are developed for the various management activities, management plans are prepared, interpretation is provided, and a management infrastructure is developed and maintained. Often, outputs are used as a means of assessing whether management is appropriate. Organizations will claim that they have successfully managed their sites because they have achieved a number of outputs. This can be very misleading because it is possible to carry out a wide range of management activities and still fail to protect the ecological character features and/or, for example, to enlist the full support and involvement of local communities. One of the worst mistakes that can be made in ecosystem management is to believe that a feature is being successfully protected when, in reality, it is not.
 - iii) **Outcomes.** This is the purpose of management. These are the favourable conditions of the ecological character features, such as habitats and species on the sites, which in turn may depend upon the effective management of particular socio-economic parameters, such as ensuring sustainable fisheries or adequate marketing of rice production and/or equitable distribution of the benefits of tourism. It

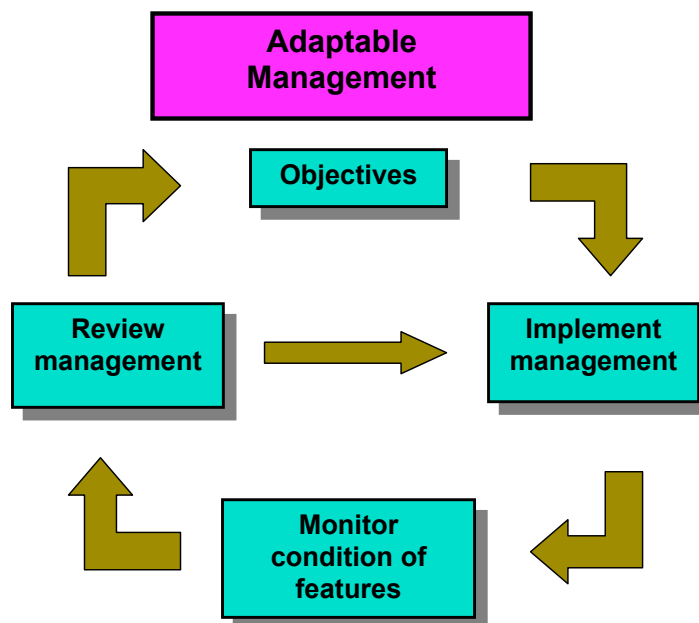
will often be necessary to undertake restoration management followed by maintenance management to ensure that the required conditions or processes are maintained. The condition of features must be defined and quantified. If this is not done, it will not be possible to judge whether the required conservation or sustainable use outcomes have been achieved.

62. The only means of judging whether or not inputs and outputs are adequate is by considering the outcomes of management. When this has been done, and only then, it will be possible to determine whether the management is appropriate.

IX. Adaptable management

63. In order to safeguard sites and their features, managers must adopt a flexible approach that will allow them to respond to the legitimate interests of others, adapt to the ever-changing political climate, accommodate uncertain and variable resources, and survive the vagaries of the natural world.
64. The adaptable management process as incorporated in the Ramsar planning approach is as follows (see Figure 2):
 - i) A decision is made about what should be achieved (i.e., quantified management objectives are prepared for the important features).
 - ii) Appropriate management, based on the best available information, is implemented to achieve the objectives.
 - iii) The features are monitored in order to determine the extent to which they meet the objectives.
 - iv) If objectives are not being met, management is modified.
 - v) Monitoring is continued to determine if the modified management is meeting the objectives, and step iv) is repeated for any further adjustments, as necessary.

Figure 2. The adaptable management cycle



65. In exceptional circumstances, it may be necessary to modify the objectives.
66. The adaptable management cycle is usually repeated at predetermined intervals. The interval should be established to take into account the nature and in particular the fragility and rate of change of the site features. However, many countries and organizations will impose a mandatory cycle. In all cases, the cycle should be repeated at any time when emergencies or unforeseen threats become apparent.
67. This adaptable approach enables wetland managers to:
 - i) learn through experience;
 - ii) take account of, and respond to, changing factors that affect the features;
 - iii) continually develop or refine management processes; and
 - iv) demonstrate that management is appropriate and effective.

X. Management units, zonation and buffer zones

68. In general, the management planning process and management plan should cover the entire site. However, where a wetland site is composed of more than one discrete sub-site separated by areas of other land use (for example, discrete wetlands along the floodplain of a major river), separate management plans for each sub-site may be appropriate. However, such individual sub-site plans must fit under the umbrella of an overview plan that should be prepared before those for the sub-sites.
69. Likewise, where the wetland is very large, it may be helpful to divide the site for management planning purposes into several contiguous zones or regions, and to develop separate management plans for each of these zones, again under the umbrella of an overall plan prepared in advance.
70. Several other types of zonation may be appropriate for application to different sites, depending on their characteristics and their relationship to other land uses in the surrounding area. Ramsar Sites range from only the area of wetland itself to the inclusion of substantial areas of surrounding non-wetland habitats, often with multiple land-uses. This great variety of what is included within the boundaries of Ramsar Sites means that any zonation scheme applied under the Convention must be sufficiently versatile and flexible to cover this variety of site characteristics.
71. When the Ramsar site itself does not include a buffer zone, it is generally appropriate for management planning purposes to identify and establish such [a] buffer zone around the core wetland area defined within a Ramsar site or other wetland. The buffer zone should be that area surrounding the wetland within which land use activities may directly affect the ecological character of the wetland itself, and the objective for land use within the buffer zone should be one of sustainable use through ecosystem management, consistent with the maintenance of the ecological character of the wetland. When a wetland site is composed of discrete sub-sites, a buffer zone should be defined for each, including, where appropriate, all the area between the sub-sites.
72. The location of a buffer zone in relation to the core wetland area of a designated Ramsar site will vary depending upon what ecosystems are

included within the site boundaries. Where the designated site is only the wetland itself, then for management purposes a buffer zone should be defined in the surrounding area outside the designated site. In contrast, where the site encompasses the wetland and its surroundings, the buffer zone should extend to the boundaries of the designated site, and then a 'core area', perhaps the wetland ecosystem itself, defined within the site.

73. As described in Section III, the dependence of wetlands on water supply from outside the wetland means that for the purposes of wetland management planning the river basin or catchment area of the coastal zone should be viewed in effect as a buffer zone for the wetland, since water and land-use in these extended areas indirectly affect the ecological character of the wetland. However, particularly in the case of a wetland within a very large river basin, basin-scale or coastal zone management may be seen as a third, outer zone for management purposes, and a more limited buffer zone immediately surrounding the wetland may still be a necessary management planning tool.
74. The Biosphere Reserve zonation concept, in which the site may include up to three zones - core zone, buffer zone (for research and training) and transition zone (for sustainable use) - is potentially applicable to all Ramsar Sites, and should be applied whenever feasible and appropriate. Its application is particularly important where a site is designated as both a Ramsar site and Biosphere Reserve, and here the relationship between the Ramsar site boundary and the zonation established for the Biosphere Reserve should be clearly established.
75. Although many Ramsar Sites are within protected areas, where the primary land-use within the site is wetland conservation, many are, like Biosphere Reserves, multiple use sites. In the latter, the management objectives for the use of the core wetland are broadly to ensure that the ecological character of the wetland is maintained or enhanced so as to continue to provide its values and functions for people's livelihoods and for biodiversity conservation.
76. Any zonation scheme should recognize the existing multiple uses of Ramsar Sites and their surroundings, and ensure that management objectives for the core zone are designed primarily to maintain the ecological character of the wetland, as well as that those for any form of surrounding buffer zone are consistent with this maintenance of the ecological character. Clear, separate but complementary and mutually supportive management objectives should be established for each zone.
77. Another approach to zonation, and one that is not mutually exclusive to the 'core/buffer zonation' approach, is that of establishing zonation for a particular use of a site. An example could be the use and development of a wetland for ecotourism. Here zonation would be used to establish in which parts of a site ecotourism access can occur, where ecotourism infrastructure should be placed (e.g., the sensitive siting of a visitor centre), and from which parts of a site ecotourism should be excluded owing to the sensitivity of those parts of the ecosystem to disturbance. Such zonation schemes will generally cut across the core and buffer zones.
78. The experience of the Man and the Biosphere Programme, under which zonation is recognized as an important part of the delimitation and

Management options

Biosphere Reserves: Zonation as a management tool

Biosphere Reserves, some of which are also Ramsar Sites, are areas of terrestrial and coastal ecosystems that are internationally recognized within the framework of UNESCO's Man and the Biosphere (MAB) Programme. Collectively, they constitute a World Network of 553 reserves in 107 countries (as of January 2010). Detailed information on the MAB Programme is available from <http://www.unesco.org/mab>.

To carry out the complementary activities of nature conservation and use of natural resources, Biosphere Reserves are organized into three interrelated zones, known as the core area, the buffer zone and the transition area. These are defined by MAB as:

The core area which needs to be legally established and given long-term protection to the landscape, ecosystem and species it contains. It should be sufficiently large to meet these conservation objectives. There may be several core areas in a single Biosphere Reserve to ensure a representative coverage of the mosaic of ecological systems. Normally, the core area is not subject to human activity, except research and monitoring and, in some cases, traditional extractive uses by local communities.

A buffer zone (or zones) which is clearly delineated and which surrounds or is contiguous to the core area. Activities are organized here so that they do not hinder the conservation objectives of the core area but rather help to protect it, hence the idea of 'buffering'. It can be an area for experimental research, for example to discover ways to manage natural vegetation, croplands, forests, fisheries, to enhance high quality production while conserving natural processes and biodiversity, including soil resources, to the maximum extent possible. In a similar manner, experiments can be carried out in the buffer zone to explore how to rehabilitate degraded areas.

An outer transition area, or area of cooperation extending outwards, which may contain a variety of agricultural activities, human settlements and other uses. It is here that the local communities, conservation agencies, scientists, civil associations, cultural groups, private enterprises and other stakeholders must agree to work together to manage and sustainably develop the area's resources for the benefit of the people who live there. The transition area is of great economic and social significance for regional development. Although presented schematically as a series of concentric rings, the three zones are usually implemented in many different ways to accommodate local geographic conditions and constraints. This flexibility allows for creativity and adaptability, and is one of the greatest strengths of the concept.

A joint work programme established in 2001, and updated in 2004, recognizes the mutual interest in the activities of the Ramsar Convention and MAB particularly in the areas of the identification and designation of sites, site management planning, assessment and monitoring, and communication, education and public awareness. As of January 2010, 123 Ramsar Sites are wholly or partially also Biosphere Reserves.



The Egyek-Pusztalócs Marshes, a Ramsar site within the Hortobágy Biosphere Reserve in Hungary that includes the main wetland habitats of the Reserve. Photo: Tim Jones

management of Biosphere Reserves as multiple use sites, is that zonation plays an important role in minimizing user conflicts by separating potentially conflicting activities whilst ensuring that legitimate land uses can continue with minimal conflict.

79. The establishment of a zonation scheme should involve full stakeholder participation from the earliest stage, since it is in 'drawing the lines' between zones that many conflicts can materialize. Establishing zonation and management objectives for each zone (and hence what activities should and should not be permitted within each zone) is an important part of the process of establishing a close involvement of local communities, indigenous peoples, and other stakeholders in the management of the wetland.
80. Some general rules should be applied when establishing zones, regardless of their type and purpose:
 - i) zonation should be established with the full involvement of stakeholders, including local communities and indigenous peoples;
 - ii) a full and detailed rationale should be made to explain the basis for establishing and delineating zones, and this is particularly important when establishing the limits of buffer zones;
 - iii) a concise description of the functions and/or restrictions applied within each zone must be prepared as part of the management plan;
 - iv) zones should be identified with a unique and, if possible, meaningful code or name: but in some cases, a simple numerical code may be adequate;
 - v) a map showing the boundaries of all zones must be prepared;
 - vi) where possible, zone boundaries should be easily recognizable and clearly identifiable on the ground: physical features (for example, fence lines and roads) provide the best boundaries, and boundaries based on dynamic features, such as rivers, mobile habitats, and soft coastlines, must be identified with some form of permanent marker; and
 - vii) on large, uniform sites, or in areas of homogeneous habitat crossed by a zone boundary, fixed permanent markers with locations mapped using a Global Positioning System (GPS) should be used.

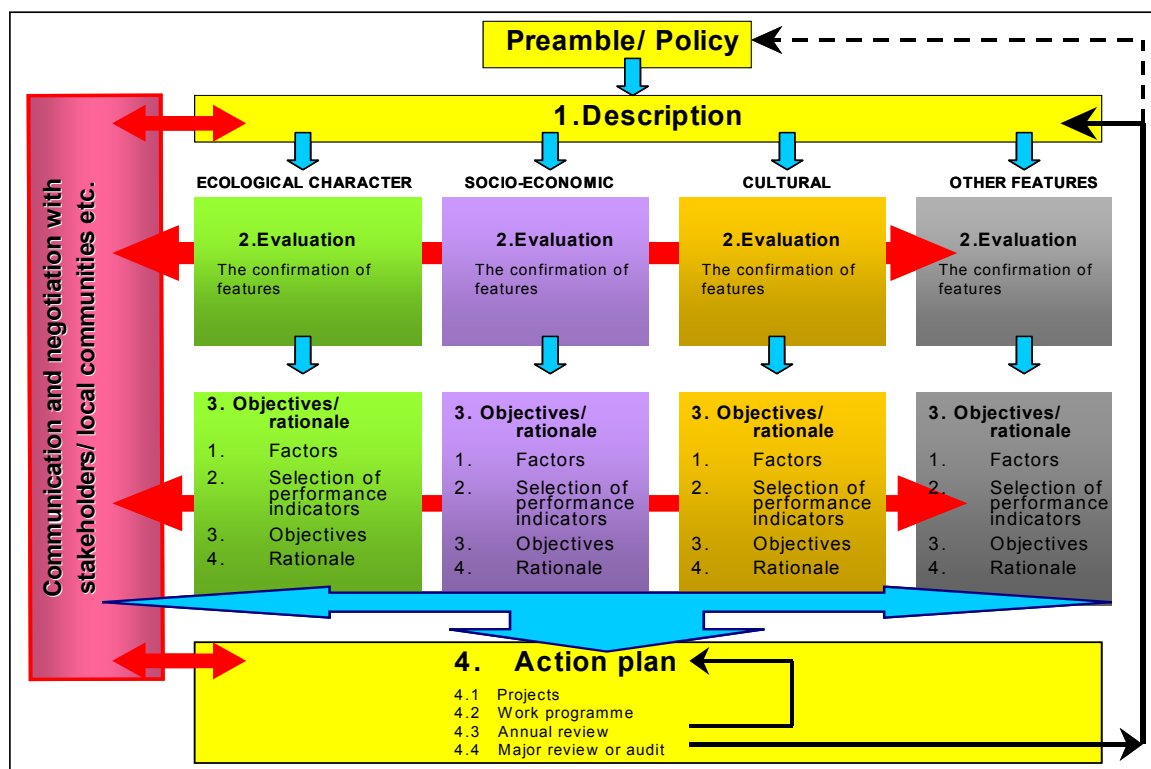
XI. Format of the management plan

81. The format of the management plan, as recommended in these guidelines, should comprise five main sections, reflecting the main steps in the management planning process:
 - a) Preamble/policy
 - b) Description
 - c) Evaluation
 - d) Objectives
 - e) Action Plan
82. Note that the steps of this process are repeated several times through the plan – they are applied to ecological character, socio-economic interests,

cultural values, and any other features of interest. In general, it is good practice to begin with ecological character, but there is no implied hierarchy.

83. The recommended structure and content of each of these sections is further described below and illustrated in Figure 3.

Figure 3. Recommended structure and content of a management plan for a Ramsar site or other wetland.



XII. Preamble / policy

84. The preamble is a concise policy statement that should reflect, in broad terms, the policies and/or practices of supranational, national, or local authorities and other organizations and traditional management systems, including, for example, non-governmental bodies, local communities or private owners' resource management arrangements that are concerned with the production and implementation of the management plan. The preamble should also recall the broad Ramsar Convention requirements; namely the maintenance of the ecological character of sites on the Ramsar List of Wetlands of International Importance, the wise use of all wetlands, the establishment of nature reserves at wetlands, whether or not they are included in the Ramsar List, and international cooperation where appropriate to the management of the site, in particular in the case of shared wetlands and water systems.

XIII. Description

85. The description is an important part of the management planning process. It provides the information used to fuel the rest of that process.

86. The description is fundamentally a collation and synthesis of existing data and information. The identification of any shortfall of relevant data and information is also a key function of this part of the process (see paragraphs 50 and 57 above).
87. In many cases, not all information needed for the basis of management planning will be available. Collection of more detailed data on these features and/or the factors influencing them, in order to fill any identified essential gaps, may be necessary, but care should be taken to ensure that only additional information essential for the establishment of management objectives for the site is the subject of further data collection.
88. The description should be regularly reviewed and updated, so as to incorporate new sources of data and information, including updates from time-series monitoring.
89. For Ramsar Sites, particular attention should be given to the description of the features of the site which have formed the justification for its designation under each of the applied Ramsar *Criteria for Identifying Wetlands of International Importance*.
90. All relevant data may be located and arranged under the headings provided in the 'Information Sheet on Ramsar Wetlands (RIS)' as amended by COP8 (Resolution VIII.13) [and by COP9 Resolutions IX.1 Annex B, IX.6, IX.21 and IX. 22], used by Contracting Parties for the designation of Ramsar Sites. It follows that the description in the RIS should clearly describe the overall ecological characteristics of the site, and identify the specific ecological character features for which the site has been designated and which need to be maintained in favourable conservation status through the management planning process. In addition, all other entries in the RIS which are not strictly related to the ecological character should also be carefully considered and incorporated in the description. It should be noted that whilst the information compiled in the RIS can form a starting point for the site description, the level of detail of information required for site management planning processes will generally go beyond that necessary in the RIS for site designation. [The 'Ramsar ecological character description sheet' will be of further help in this (see Section B of this Handbook above).]
91. However, it is important that the information derived from the existing data is presented in the plan description in a concise manner and in a language and presentation that is easy for all stakeholders to understand, rather than full of detailed scientific terms and jargon of interest only to scientific and technical experts in those particular subjects.
92. The plan description should make reference to, but should not contain sensitive data on, rare or endangered species - this should remain confidential.
93. The plan description should also include information on any particular local features or characteristics of the site, especially its values and functions for people, that may be helpful in establishing priorities and setting management objectives.

See also Handbook
17, Designating
Ramsar Sites

94. All descriptions should include a bibliography containing references that provide an 'audit trail' to all papers, reports, journals, books, etc., and unpublished sources used during the preparation of the plan.

XIV. Evaluation

95. Evaluation is the process of identifying or confirming the important features or foci for management planning. Figure 3 indicates that evaluation of important features should be undertaken for each of four major areas of interest, and the evaluation process must be applied to each in turn. For Ramsar Sites and other wetlands, evaluation should be undertaken for ecological character features, as well as for socio-economic features, cultural features, and any other important features identified.
96. Evaluation criteria must be developed for each feature of interest. A list of criteria, with examples, recommended for evaluating ecological character features is provided below, along with an indicative list for socio-economic and cultural criteria which should be further developed for each site to take into account its specific socio-economic and cultural characteristics.

Evaluation of ecological character (habitats, species and natural processes)

97. The important features of the ecological character (habitats, populations, and processes) of a site, as [now defined by Resolution IX.1 Annex A, and elaborated in the Annex to Resolution X.15], provide a focus for the planning process. The main purpose of this section of the management plan is to provide a list of the features and to confirm their status. The status of features that have been previously recognized should be confirmed. An evaluation process is required for features where there has been no previous, or formal, recognition of the features.
98. The evaluation process should utilise the guidance adopted by the Convention for wetland inventory and assessment which provide tools for evaluation of ecological character and the status of wetlands.
99. In some cases, the presence of the important ecological character features on a site will have been recognized prior to planning. For example, the site may contain legally protected species or habitats. It is essential that the legal status of such features be recognized.
100. The list of criteria below is recommended for the evaluation of ecological character features. The list is not intended to be fully comprehensive, nor is there any suggestion that it will be appropriate to all features on all sites. Only the relevant or useful criteria should be used, and additional criteria should be added as circumstances require.
101. Note that the criteria often overlap or are interdependent. For example, it is difficult to discuss fragility without considering rarity. Fragile features are, by their nature, generally rare.
102. The criteria should always be regarded as having negative as well as positive aspects. For example, high levels of biological diversity (i.e., habitat or species richness) are usually regarded as of high importance, but such assumptions should be evaluated with care, and in the context of the general biodiversity characteristics of particular wetland types and their

location, since high diversity can be the consequence of human intervention in a habitat that is naturally species-poor rather than a naturally occurring phenomenon.

103. The recommended criteria for evaluating ecological character features are as follows.

Criterion 1 for evaluating ecological character features: Size

104. In most cases, the importance of a feature will increase with size. However, size as a criterion must always be linked to other qualities. Small areas of high-quality habitat can often be more highly valued than large areas of low-quality habitat.
105. Size is of particular importance where habitats are fragmented and populations isolated. The viability of small, and isolated, features and sites is usually questionable. Very small populations are often extremely vulnerable and can become extinct simply through chance, despite appropriate management. Nevertheless, such places may, at times, represent the last remaining examples of a habitat or population and may therefore be significant in the maintenance of overall biological diversity.

Criterion 2 for evaluating ecological character features: Biological diversity

106. The maintenance of biological diversity is usually regarded as one of the most important aims of nature conservation and the sustainable use of biological resources. This is largely because one of the most obvious, and serious, effects of human intervention on the environment has been the destruction of habitats and extinction of species. Consequently, management is frequently carried out in order to maintain, or even improve, site diversity. However, it must be recognized that there are occasions when high diversity is undesirable. For example, cut, over-drained, or otherwise modified peat bogs will contain a greater diversity of communities and species than an intact, natural bog.
107. High diversity is sometimes a feature of dynamic or disturbed habitats, giving rise to an opportunity for seral vegetation succession. Where this instability is natural, the resultant high diversity is highly valued. Conversely, where the disturbance is a consequence of human intervention, the value of the resultant diversity is doubtful.

Criterion 3 for evaluating ecological character features: Naturalness

108. Naturalness is one of the most important criteria applied to ecological character features. In general, the more natural a feature is, the greater the value of its ecological character. However, very few, if any, wetlands in the world can be regarded as wholly natural, and it is recognized that even highly modified habitats can be extremely important for wildlife.

Criterion 4 for evaluating ecological character features: Rarity

109. Rarity is the one aspect of biodiversity conservation that has generally received most attention, and, as a consequence, managers are usually aware of the most rare and endangered habitats and species on their sites. These will feature prominently in any management plan. Often it is the presence

of rare habitats or species that leads to the selection of sites for protection management – for Ramsar Sites, through the application of Ramsar Criterion 2 concerning threatened species and ecosystems.

Criterion 5 for evaluating ecological character features: Fragility

110. To a greater or lesser extent, all ecological character features demonstrate a degree of fragility. Fragility should always be considered within a time scale, and the degree to which the damage is permanent is a crucial consideration. Fragility is almost invariably linked to rarity; fragile features are, or soon become, rare.
111. Fragility should not always be dismissed as a negative factor. Many natural communities rely on disturbance for their survival. These usually ephemeral communities often occur during the early successional stages of dynamic habitats. Intentional disturbance is often a necessary and legitimate part of management aimed at setting back succession for the purpose of maintaining community vigour, as in the case of burning or grazing to enhance grasslands.
112. Species may also be fragile, most often as a result of habitat change or destruction. Some have such specialized and complex requirements that a seemingly obscure or minor change can have devastating effects.

Criterion 6 for evaluating ecological character features: Typicalness

113. Sites are usually selected and valued because they contain the best, or at least a good, example of a particular feature, for example through Criterion 1 for the identification and designation of Ramsar Sites. The qualities that render a feature exceptional are most often the unusual or rare. It is also important, however, that the typical and commonplace should not be undervalued. This criterion is particularly useful for providing the justification for safeguarding the typical features in an area.

Criterion 7 for evaluating ecological character features: Potential for improvement and/or restoration

114. Most features are, to a greater or lesser extent, imperfect. This criterion is used to assess the potential for improvement or restoration. Severely degraded features may have varying degrees of potential for improvement; some will have none at all, while others will have potential for total recovery, given appropriate management. The need to identify this potential is crucial. There can be no justification for wasting resources in attempting to manage a degraded feature when the underlying reasons for the damage cannot be reversed.
115. The *Principles and guidelines for wetland restoration*, adopted by COP8 Resolution VIII.16, provide further guidance on the selection of wetlands appropriate for restoration. (See [Section F[re-check this x-ref after doing HB19] on restoration in Handbook 19].)

Evaluation of other features of importance on wetland sites

116. In addition to the ecological character features, most sites will contain other features of equal importance, for example, cultural, socio-economic,

Additional information

Valuing wetlands: Guidance for valuing the benefits derived from wetlands ecosystem services (Ramsar Technical Report 3)

To assist Contracting Parties in having economic valuation information readily available for decision-making on wetlands, Ramsar's COP8 (2002) requested the Convention's Scientific and Technical Review Panel (STRP) to prepare guidance on practical methods for wetland valuation. Ramsar's Technical Report 3 *Valuing wetlands: Guidance for valuing the benefits derived from wetlands ecosystem services* provides this guidance and updates information on available methodologies from those in the 1997 book *Economic valuation of wetlands: a guide for policy makers and planners*.

The report outlines a framework which will assist readers in conducting an integrated assessment of wetland ecosystem services, setting out the following five key steps in undertaking a wetland valuation assessment:

- Step 1: Analysis of policy processes and management objectives (*why undertake the valuation?*).
- Step 2: Stakeholder analysis and involvement (*who should do the valuation, and for whom?*).
- Step 3: Function analysis (identification & quantification of services) (*what should be valued?*).
- Step 4: Valuation of services (*how should the valuation be undertaken?*).
- Step 5: Communicating wetland values (*who needs to know the assessment results?*).

Subsequent sections provide more detailed guidance on each of these steps and the range of available methods for their application. This guidance is supplemented by case studies from around the world exemplifying where different aspects of wetland valuation have supported decision-making.

The preparation of this guidance was led by Rudolf de Groot and Mishka Stuip of Wageningen University and the Foundation for Sustainable Development (FSD) in the Netherlands, with input from the Convention's STRP and Secretariat. It is available in PDF format (1.6MB), published jointly as Ramsar Technical Report No. 3 (available for download from www.ramsar.org/pdf/lib/lib_rtr03.pdf) and as No. 27 in the Convention on Biological Diversity's CBD Technical Series.



geological and geomorphological features, landscape and palaeo-environmental features. It is important that these features be given appropriate attention and that the full management planning process be followed for each. This is particularly important in relation to ensuring the involvement and input of all stakeholders (see Section V).

117. The evaluation should focus on the values and functions, goods and services provided by the wetland in support of human well-being and on the presence of cultural features, both cultural artefacts and structures

and their religious and faith significance, especially for local communities and indigenous peoples. Geological, geomorphological and landscape significance should also be evaluated in this section of the plan.

118. Some wetlands can also have additional features that do not fall under ecological character or socio-economic or cultural features, and these should also be identified and evaluated. An example would be the importance of a wetland for scientific research or long-term monitoring.
119. In evaluating socio-economic features of the wetland, it is appropriate to apply the techniques of economic valuation of wetlands and draw on information provided by these techniques. For further information on economic valuation, see the 1997 Ramsar publication on *Economic valuation of wetlands: a guide for policy makers and planners* [and the 2006 Ramsar Technical Report 3 *Valuing wetlands: Guidance for valuing the benefits derived from wetlands ecosystem services*].
120. An indicative list of socio-economic values and functions of wetlands is given in Box 1. Note that not all these features will be applicable to all wetlands.

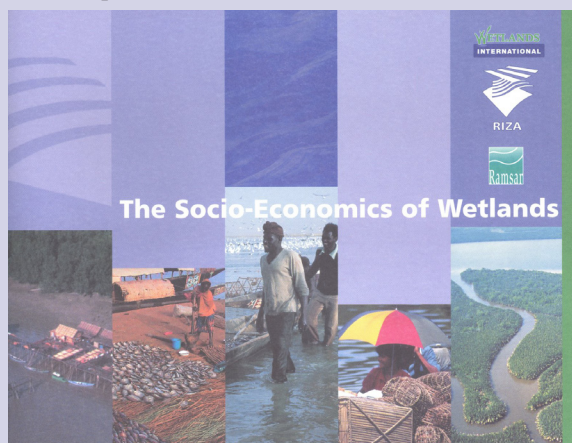
Additional information

The Socio-Economics of Wetlands

by M.A.M. Stuij, C.J. Baker, and W. Oosterberg

“Although the potential for wetlands to enrich human life and support (often spectacular) ecosystems is generally acknowledged, the protection of these values is often considered to be in conflict with what appear to be more profitable economic uses. In the face of hard economics and the need for governments to show tangible development achievements, it has often been difficult to present persuasive evidence to help combat unsustainable development options.”

In response to this difficulty, as described by Delmar Blasco, former Secretary General of the Ramsar Convention, and Bart Fokkens, Director of the Wetland Development and Restoration Department, RIZA, in the Foreword, Wetlands International and RIZA (Institute for Inland Water Management and Waste Water Treatment) have produced an attractive 36-page pamphlet entitled *The Socio-Economics of Wetlands*, launched at Ramsar COP8 in November 2002.



Sections of the colorful brochure cover what wetland values are, how they can be taken into account in decision-making, and how they can be translated into incentives; in addition, six brief case studies, figures and illustrations, and a list of references are included.

The pamphlet can be downloaded in PDF format from <http://www.wetlands.org/publication.aspx?id=5e202853-6f99-463f-b12a-98543220a67a> or purchased from NHBS (<http://www.nhbs.com>) for £10.

BOX 1.[A] Indicative list of [ecosystem services] for the evaluation of socio-economic features of wetlands for management planning

(derived from [Appendix 2] of CBD's [Voluntary guidelines on biodiversity-inclusive environmental impact assessment], see Resolution [X.17] [and Handbook 16 in the present series])

Regulating services responsible for maintaining natural processes and dynamics

Biodiversity-related regulating services

- maintenance of genetic, species and ecosystem composition
- maintenance of ecosystem structure
- maintenance of key ecosystem processes for creating or maintaining biodiversity

Land-based regulating services

- decomposition of organic material
- natural desalinization of soils
- development / prevention of acid sulphate soils
- biological control mechanisms
- pollination of crops
- seasonal cleansing of soils
- soil water storage capacity
- coastal protection against floods
- coastal stabilization (against accretion / erosion)
- soil protection
- suitability for human settlement
- suitability for leisure and tourism activities
- suitability for nature conservation
- suitability for infrastructure

Water related regulating services

- water filtering
- dilution of pollutants
- discharge of pollutants
- flushing / cleansing
- bio-chemical/physical purification of water
- storage of pollutants
- flow regulation for flood control
- river base flow regulation
- water storage capacity
- ground water recharge capacity
- regulation of water balance
- sedimentation / retention capacity
- protection against water erosion
- protection against wave action
- prevention of saline groundwater intrusion
- prevention of saline surface-water intrusion
- transmission of diseases
- suitability for navigation
- suitability for leisure and tourism activities
- suitability for nature conservation

Air-related regulating services

- filtering of air
- carry off by air to other areas
- photo-chemical air processing (smog)
- wind breaks
- transmission of diseases
- carbon sequestration

Provisioning services: harvestable goods

Natural production:

- timber
- firewood
- grasses (construction and artisanal use)
- fodder & manure
- harvestable peat
- secondary (minor) products
- harvestable bush meat
- fish and shellfish
- drinking water supply
- supply of water for irrigation and industry
- water supply for hydroelectricity
- supply of surface water for other landscapes
- supply of groundwater for other landscapes
- genetic material

Nature-based human production

- crop productivity
- tree plantations productivity
- managed forest productivity
- rangeland/livestock productivity
- aquaculture productivity (freshwater)
- mariculture productivity (brackish/saltwater)

Cultural services providing a source of artistic, aesthetic, spiritual, religious, recreational or scientific enrichment, or nonmaterial benefits.

Supporting services necessary for the production of all other ecosystem services

- soil formation,
- nutrients cycling
- primary production.
- evolutionary processes]

[B]. Ecosystem services provided or derived from wetlands	
(taken from the Millennium Ecosystem Assessment's Synthesis report on wetlands: <i>Ecosystems and human well-being: wetlands and water synthesis: a report of the Millennium Ecosystem Assessment</i>)	
PROVISIONING	
Food	production of fish, wild game, fruits, and grains
Fresh water ^a	storage and retention of water for domestic, industrial, and agricultural use
Fiber and fuel	production of logs, fuelwood, peat, fodder
Biochemical	extraction of medicines and other materials from biota
Genetic materials	genes for resistance to plant pathogens, ornamental species, and so on
REGULATING	
Climate regulation	source of and sink for greenhouse gases; influence local and regional temperature, precipitation, and other climatic processes
Water regulation (hydrological flows)	groundwater recharge/discharge
Water purification and waste treatment retention	recovery, and removal of excess nutrients and other pollutants
Erosion regulation	retention of soils and sediments
Natural hazard regulation	flood control, storm protection
Pollination	habitat for pollinators
CULTURAL	
Spiritual and inspirational	source of inspiration; many religions attach spiritual and religious values to aspects of wetland ecosystems
Recreational	opportunities for recreational activities
Aesthetic	many people find beauty or aesthetic value in aspects of wetland ecosystems
Educational	opportunities for formal and informal education and training
SUPPORTING	
Soil formation	sediment retention and accumulation of organic matter
Nutrient cycling	storage, recycling, processing, and acquisition of nutrients
^a While fresh water was treated as a provisioning service within the MA, it is also regarded as a regulating service by various sectors.	

121. Landscape and wilderness qualities are often overlooked in management plans when they apply to protected areas. For sites where habitat management and maintenance is important, and there are few human-made structures, the management of the habitat will usually also cover most landscape issues. For most natural protected areas, landscape management will be concerned with minimising, or removing, the influence of people where this is regarded as visually damaging.

122. In the case of sites where there are significant anthropogenic artefacts with historical, cultural or religious values, these should also be safeguarded through the management planning process. Such features could be included in a plan's section on landscape, but their protection and maintenance is probably best achieved by regarding them as features of interest, and dealing with them as any other feature.



Archaeologists working in a fragile wetland site in Somerset, England, uncovering a trackway built in 3600 BC across the marshes. Photo: courtesy, Somerset Levels Project

123. [A suggested typology of wetland-related cultural activities and values] is provided in Box 2.

124. For further guidance on the identification and incorporation of cultural issues and features, including cultural artefacts and cultural landscapes, see the *Guiding principles for taking into account the cultural values of wetlands for the effective management of sites* annexed to Resolution VIII.19 (see [Appendix I]), and *Culture and wetlands: a Ramsar guidance document*, produced by the Ramsar Culture Working Group in 2008 and available for download from the Convention website at http://www.ramsar.org/cda/ramsar/display/main/main.jsp?zn=ramsar&cp=1-63-412-416_4000_0__.

XV. Objectives

125. Through undertaking the evaluation, a list of the important site features will have been identified. The next step is to prepare management objectives for each of these features.

126. An objective is an expression of something that should be achieved through management of the site. Objectives should have the following characteristics:

BOX 2. [Suggested typology of wetland-related cultural activities and values, for evaluation in wetland management planning]	
(derived from [<i>Culture and wetlands: a Ramsar guidance document</i> - launched at COP10 by the Ramsar Culture Working Group, 2008])	
<p>[1. Habitation</p> <ul style="list-style-type: none"> 1.1 Cultural landscapes 1.2 Cultural heritage sites 1.3 Settlements and structures <ul style="list-style-type: none"> 1.3.1 Ancient sites and structures (up to 1599) 1.3.2 Traditional and modern settlements and structures 1.4 Wetland archaeology 1.5 Infrastructure <ul style="list-style-type: none"> 1.5.1 Terrestrial transportation networks 1.5.2 Water management facilities and networks <p>2. Primary uses of wetland resources</p> <ul style="list-style-type: none"> 2.1 Agriculture <ul style="list-style-type: none"> [2.1.1. Rice cultivation]* 2.1.2 Other wetland related agriculture 2.2 Stock-breeding 2.3 Fishing and aquaculture <ul style="list-style-type: none"> 2.3.1 Artisanal fisheries 2.3.2 Commercial fisheries 2.3.3 Extensive aquaculture practice [2.3.4 Intensive aquaculture facilities] 2.3.5 Sports fishing 2.4 Management of forest wetland types <ul style="list-style-type: none"> 2.4.1 Wood products 2.4.2 Non-wood forest products 2.5 Hunting <ul style="list-style-type: none"> 2.5.1 Subsistence hunting 2.5.2 Sports hunting 2.6 Salt extraction <ul style="list-style-type: none"> 2.6.1 Artisanal/traditional salinas 2.6.2 Industrial facilities [2.7 Mining and quarrying] <ul style="list-style-type: none"> [2.7.1 Sand and gravel extraction] [2.7.2 Gold mining] [2.7.3 Other mineral extraction] 2.8 Water use <ul style="list-style-type: none"> 2.8.1 Irrigation 2.8.2 Domestic use 2.8.3 Water transfer infrastructure 2.8.4 Industrial use (energy production) 2.8.5 Other water uses (water mills, saw mills etc) 2.9 Use of other wetland natural resources <ul style="list-style-type: none"> 2.9.1 Biomass extraction 2.9.2 Sustainable use of medicinal plants 	<p>[3. Secondary use of wetland resources</p> <ul style="list-style-type: none"> 3.1 Food processing <ul style="list-style-type: none"> 3.1.1 Traditional methods of food preservation 3.1.2 Culinary heritage 3.2 Craftsmanship <ul style="list-style-type: none"> 3.2.1 Artefacts <ul style="list-style-type: none"> 3.2.1.a Artefacts of ancient origin (up to 1599) 3.2.1.b Traditional and modern artefacts 3.2.2 Handicrafts and tools <ul style="list-style-type: none"> 3.2.2.a Handicrafts and tools of ancient origin (up to 1599) 3.2.2.b Traditional and modern handicrafts and tools 3.2.3 Transportation means (boats etc) <ul style="list-style-type: none"> 3.2.3.a Ancient transportation means (up to 1599) 3.2.3.b Traditional and modern transportation means 3.3 Traditional building construction <ul style="list-style-type: none"> 3.3.1 Dwellings 3.3.2 Utilitarian buildings 3.3.3 Public buildings 3.4 Wetland-based traditional marketing 3.5 Tourism – eco-tourism and cultural tourism 3.6 Leisure and sports <ul style="list-style-type: none"> 3.6.1 Nature appreciation 3.6.2 Hiking and mountain climbing 3.6.3 Rafting and kayaking 3.6.4 Sailing and boating 3.6.5 Diving 3.6.6 Speleology 3.7 Social practices and methods 3.8 Festivals, celebrations and events <p>4. Knowledge, belief systems and social practices</p> <ul style="list-style-type: none"> 4.1 Scientific research and education 4.2 Traditional knowledge <ul style="list-style-type: none"> 4.2.1 Oral traditions and expressions 4.2.2 Languages, dialects and special terms 4.2.3 Gender, age and social class-related roles 4.2.4 Practice of traditional medicine 4.3 Spirituality and belief systems 4.4 Artistic expression <p><small>**Square brackets denote items whose inclusion was questioned by a small number of consultees in their responses to drafts of the guidance document - see Chapter 5 of the document itself for a discussion of this.]</small></p>

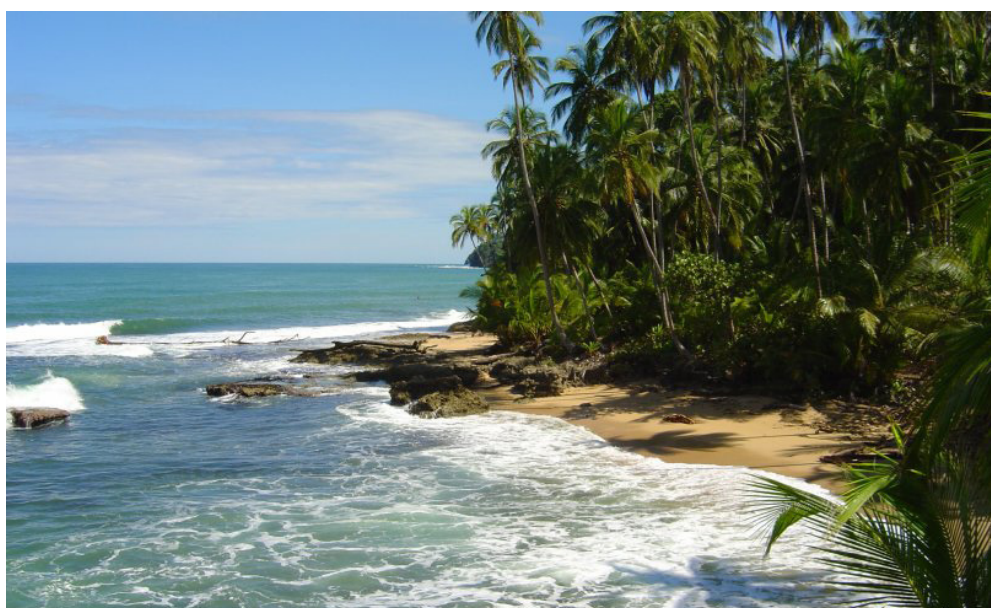
- i) **Objectives must be measurable.** Objectives must be quantified and measurable. If they are not measurable, it will be impossible to assess through monitoring whether they are being achieved.
- ii) **Objectives should be achievable, at least in the long term.** This is a very obvious, but often forgotten, characteristic – there can be little purpose in pursuing unattainable objectives.
- iii) **Objectives must not be prescriptive: they define the condition required of a feature and not the actions or processes necessary to obtain or maintain that condition.** Objectives are an expression of purpose. A differentiation should be made between the purpose of management and the management process, because the management undertaken to safeguard a feature will vary according to the condition of that feature. For example, in the case of a derelict feature, recovery management may be applied until the feature reaches the desired condition, at which time maintenance management can be substituted. These two management approaches can be fundamentally different, or may simply vary in intensity.

Preparing measurable objectives

127. There are three key steps in the process of preparing measurable objectives:

- i) Describe the condition that is required for a feature.
- ii) Identify the factors that influence the feature, and consider how the feature may change as a consequence.
- iii) Identify and quantify a number of performance indicators for monitoring progress in achieving the objectives for that feature.

128. The process of applying the three steps is outlined below.



Coastal sites, such as the Gandoca-Manzanillo Ramsar Site in Costa Rica shown here, provide valuable protection against storms, one of the many wetland services that can be used for the evaluation of socio-economic features of wetlands for management planning. *Photo: Julio Montes de Oca, UICN/ORMA*

Step 1. Describe the condition that is required for a feature

129. Most current management plans avoid describing the conditions required of the features. Typically, the plan will discuss maintaining or improving a feature, but will not explain what is to be maintained or how it will be established that it has improved. In order to judge whether or not the objectives are being achieved, there must be a clear description of the conditions that are required for the features.
130. The first step is to provide a description, using plain language, of the conditions that the plan is attempting to obtain or maintain. This is perhaps the long-term vision for the feature. There is no need to focus too strongly upon quantification at this stage – that should be done at a later point in the process.
131. A useful approach for habitats and species, which can be applied anywhere, has been developed by the European Union for Natura 2000 conservation sites. It is a generic approach towards defining the condition in which it is wished to maintain a feature. The European Union requires that features on European sites be maintained at “favourable conservation status”.¹⁰
132. Habitats are in favourable conservation status when:
- i) they are stable or increasing in area;
 - ii) they are sustainable in the long term;
 - iii) the condition of typical species is also favourable; and
 - iv) the factors that affect the habitat or its typical species are under control.
133. Species are in favourable conservation status when:
- i) the population is viable in the long term;
 - ii) the range is not contracting;
 - iii) sufficient habitat exists to support the species in the long term; and
 - iv) the factors that affect the habitat, or its typical species, are under control.
134. These generic definitions of favourable conservation status for habitats and species are simply an expression of what would be wished of any habitat or species that requires management and could be applied to any feature on any site. Clearly, the generic statement must be developed into one with rather more meaning for particular features of the site, but this is an excellent starting point.
135. Similar statements about “favourable status” should also be developed for features related to human activities and/or practices within the site and/or the buffer zone, in particular in relation to their sustainability and the carrying capacity of the site.

Step 2. Identify the factors that influence the feature, and consider how the feature may change as a consequence

136. The ability to achieve objectives will always be influenced by factors. Factors include policies, strategies, trends, constraints, practices, conflicts of interest

¹⁰ Further information about the EU Natura 2000 sites and the Habitats and Birds Directives can be found at [http://ec.europa.eu/environment/nature/legislation/index_en.htm].

and obligations, in fact anything that influences, or may influence, the features. In terms of the Convention, these are essentially those activities that are causing, or are likely to cause, change in ecological character. It is important that both negative and positive factors be considered, since both will have implications for management.

137. The conservation management of habitats and species is mainly about controlling factors, and in particular the consequences of human intervention, past, present and future, and the conflicts of interest among different stakeholders. When attempting to safeguard natural habitats, managers have to control, as far as possible, damaging human activities or influences and to encourage those that contribute to long-term conservation. For example, hunting, timber extraction, and burning are often controlled. For habitats which have been created or modified by human influence, and have become valued as conservation sites, managers often maintain human influence, though they usually call this management (for example, the controlled burning or grazing of grassland to prevent it from reverting to scrub).
138. Uncontrollable factors that may or may not be of human origin must also be taken into account. For example, climate change and invasive species can alter stability and frustrate the ability to measure, predict or sustain desired conditions, and avoidance or control may be impossible. Early recognition of these management limitations can facilitate the development of contingency measures.
139. The influence of factors should be considered for each feature in turn, and then consolidated for statement in the plan as necessary. For example, one factor may influence several features identified for the site, and establishing an appropriate management intervention for that factor needs to take into account the possibility of it having simultaneous positive and negative influences upon different features.
140. Factors, both positive and negative, can be identified and grouped under the following headings:
 - i) Internal natural factors
 - ii) Internal human-induced factors
 - iii) External natural factors
 - iv) External human-induced factors
 - v) Factors arising from legislation and tradition
 - vi) Factors arising as a result of conflicts/communality of interest
 - vii) Physical considerations and constraints
 - viii) Institutional factors
141. Examples, both positive and negative, of these categories of factors with implications for ecological character features are given below.
 - i) **Internal natural factors** - include natural succession in vegetation and variations in water level caused by precipitation.
 - ii) **Internal human-induced factors** - include the spread of invasive alien species, on-site pollution, and inappropriate, or unsustainable, agricultural practices (for further guidance on managing invasive alien

species, see Resolution VIII.18]; and for further guidance on wetlands and sustainable fisheries management, see Appendix II]).

- iii) **External natural factors** - include factors arising outside the wetland, such as positive or negative impacts of climate change and variations in currents or sea level (for further guidance on mitigating the impacts of climate change and sea-level rise through wetland management, see Resolution [X.24]).
- iv) **External human-induced factors** - include diversion of water supply, changing natural pattern and variability of water flows, effective water allocation regimes, increased or decreased sedimentation caused by upstream engineering works, and pollution.
- v) **Factors arising from legislation, tradition** - include legal and traditional rights and obligations placed on the managers of the site. Legal obligations can arise from national or local legislation or international commitments, with national and local laws likely to be the more important factor. Traditional and culture issues may include grazing, fishing, and logging rights and/or religious aspects (see Ramsar's *Guidelines for establishing and strengthening local communities' and indigenous peoples' participation in the management of wetlands*, Resolution VII.8, *Guiding principles for taking into account cultural values of wetlands for the effective management of sites*, Resolution VIII.19 [see Appendix I of this Handbook] [and *Culture and wetlands: a Ramsar guidance document*, produced by the Ramsar Culture Working Group]).
- vi) **Conflicts/communality of interest** – includes the likely opposition or support of different stakeholders, depending on whether they see the management plan as contributing to maintain their benefits or not, or providing an opportunity to develop their interests.
- vii) **Physical considerations and constraints** - include physical factors, such as inaccessibility, which may affect the achievement of management objectives.
- viii) **Institutional factors** – includes any limitations to the capacity and authority of organisations responsible for plan implementation, and the inter-relationship (or lack of it) between the organisations or agencies responsible for wetland conservation and wise use and those responsible for other sectors directly or indirectly affecting the wetland, at local, regional (sub-national) and national scales.

The relationship between factors and features

- 142. Once the factors have been identified, the effect that they will have on the feature must be considered. The influence of factors should be considered for each identified feature in turn.
- 143. Features will change as a consequence of the factors, and it is important that the direction of change and any potential indicators of change should be identified. This relationship between factors and the selection of appropriate performance indicators is very important. It is not possible to measure everything on a site; managers must focus, therefore, on monitoring those indicators that are most likely to change.

144. It is essential that both the features and the factors which influence these features be monitored.

Operational limits

145. The purpose of operational limits is to define a range of values for each factor which will be considered acceptable and tolerable levels.
146. The most significant factors provide a focus for surveillance or monitoring. These factors will have a positive or negative impact on the ability to manage features. Acceptable levels should be defined for any factors known to have a significant impact on the features. For example, it is often necessary to set a level of tolerance for an invasive alien species, which could be anything from total exclusion to accepting the presence of a species providing the population remains below a given limit. Other examples could include biological limits, such as a limit on the extent of scrub cover in wet grassland, and limits on human activities such as hunting or fishing.
147. Operational limits require an upper or a lower limit, or sometimes both. In reality, though, both upper and lower limits are seldom applied to the same factor. Upper limits are usually applied to undesirable factors - they define the maximum tolerance - and lower limits are applied to positive factors.
148. In most instances it will not be possible to set precise, scientifically defined limits. This should not be considered a major issue, however. Operational limits are an early warning system, acting as a trigger for action, reached long before there is any significant threat to the long-term viability of the feature. If scientific information is not available, then professional experience comes into play.
149. Key questions concerning operational limits for factors are:
- i) to what extent can a negative factor be allowed to influence a feature before there is any need for concern; and
 - ii) to what extent is it necessary to ensure that positive factors are maintained.
150. It should be remembered that limits, like objectives, are not fixed forever – they can be revised later if experience, or new scientific information, suggests that it is expedient to do so.
151. An example to illustrate the process and links between identifying a feature, a factor affecting it, an objective for its management, and the setting of operational limits is given in Box 3.

Monitoring of factors

152. It is essential that the factors which are influencing or may influence the features are monitored or recorded. (See also Section D.)
153. Factors which have been quantified and are subject to the operational limits described in the preceding paragraphs must be monitored. For example, the degree of tolerance of an alien invasive species in a habitat will be expressed as an upper limit. Once a limit has been set, the invasive species must be monitored to ensure that its population does not exceed the limit. When and if the limit is exceeded, management or control will be implemented.

BOX 3. An example of the management planning process for identifying features, factors, objectives and operational limits.

Feature: an important population of a globally threatened endemic fish species (for which the site was selected for Ramsar designation under Criteria 2 and 7).

Factor: the fish species is targeted for capture by recreational fisherman, which may be threatening the viability of the fish population.

Objective: the maintenance of a viable population of the fish species, through the establishment of controls on the recreational fishery.

Operational limits (adopted under the management plan following consultation and agreement with local stakeholders):

- a) a limit on the number of fisherman allowed to catch the fish (through establishing a permit system);
- b) a limit on the number of fish of this species that may be taken (e.g., each fisherman may take only three individuals during one fishing season, with all others to be released); and
- c) a limit on the minimum size of fish of this species that may be taken (e.g., only adult fish longer than 20 cm may be taken, with all others to be released).

154. Recording or surveillance will be required when the relationship between a feature and a factor is unclear. For example, one of the factors that will affect grassland is grazing by wild animals. When the impact of the animals on the vegetation is unknown, it will not be possible to identify the appropriate stocking levels. In this case, a recording programme is required to record, in a structured and consistent manner, the number of grazing animals. In time, it may be possible to establish what the stocking levels should be, and move from surveillance to monitoring.

Environmental Impact Assessments (EIA)

155. The preceding section explains why the important factors must be identified and monitored, and recommends that their impact on the wetland features must be considered in the management plan. Minor, or easily controllable, factors can be dealt with as set out above. However, any major proposals for development or land use changes, on or off the site, may require that an Environmental Impact Assessment be undertaken before the site management plan can be completed. In circumstances where there is more than one proposal, the EIA should take into account the cumulative impact of the proposals.
156. In addition, any new factors, including development proposals, on or off the site, that are likely to have a significant impact on the ecological character of the site, should be subject to a full EIA. A monitoring system should be set in place to ensure that unforeseen impacts are detected, and a process to address negative impacts put in place before the project commences.
157. An EIA may conclude that a development proposal is likely to have a significant negative impact on all or part of the site. If, for overriding reasons, the project is still planned to go ahead, minimization of damage, mitigating measures, and/or compensating measures should be established.

See also Handbook
16, Impact
Assessment

158. For further guidance on impact assessment for wetland sites, see Resolution VII.16 and the guidance adopted by Resolution [X.17].

Step 3. Performance indicators, limits and monitoring

159. Objectives must be quantified and measurable. This stage in the planning process identifies the performance indicators that will be used to provide evidence about the condition of a feature.

160. Because it is not possible to measure the totality of a feature, there is a need to focus on a limited range of performance indicators. For example, under a management objective of maintaining water quality, this feature is made up of many components including salinity, pH, conductivity, dissolved oxygen concentration, nutrient concentration, heavy metal concentration, etc. Not all of these are likely to be easy or cost-effective to monitor, but an appropriate performance indicator for water quality, because it meets the four criteria below, would be nutrient concentration.

161. In general, performance indicators:

- i) are characteristics, qualities or properties of a feature that are inherent and inseparable from that feature;
- ii) should be indicators of the general condition of a feature, and should be informative about something other than themselves;
- iii) must be quantifiable and measurable; and
- iv) should provide an economical method for obtaining the evidence required to enable the current condition of a feature to be determined.

162. Some general examples of performance indicators for the species and habitat components of ecological character features are:

i) **Performance indicators for species:**

a) *Quantity:*

The size of a population, for example:

- the total number of individuals present
- the total number of breeding adults
- the population at a specified point in an annual cycle
- the extent or distribution of a population

b) *Quality:*

- survival rates
- productivity
- age structure

ii) **Performance indicators for habitats:**

a) *Quantity:*

- size of area occupied by the habitat
- distribution of the habitat

b) *Quality:*

- physical structure
- individual or groups of species indicative of condition
- individual or groups of species indicative of change

163. Performance indicators for socio-economic and cultural features should also be identified and incorporated into the management plan.

Specified limits

164. Specified limits represent thresholds for action and should trigger an appropriate response. They define the degree to which the value of a performance indicator is permitted to fluctuate without creating any cause for concern. Thus, ideally, two values are required, an upper limit and a lower limit. Unfortunately, it is not always possible to define both limits.
165. The key to understanding limits is an appreciation of what should happen when a limit is exceeded.
166. In order to define what happens when a limit is exceeded, it is necessary:
- i) to check the monitoring project and the data collected to ensure that there are no errors. If everything is in order, proceed to the next step. If not, amend the monitoring project.
 - ii) if a change has taken place and the limit has been exceeded, to find out why the change has occurred. Changes happen because of the impact of a factor, or factors, or the lack of appropriate management. Where the factors, or failure of management, are known, it may be necessary to carry out remedial management to deal with the factor or improve existing management.
 - iii) when a change has taken place and the reason is unknown, to establish a research project to identify the cause.
167. Limits for ecological character features should be developed in recognition of the natural dynamics and cyclic change in populations and communities. In reality, there are very few features for which the natural fluctuations are fully understood. For a population, the lower limit might be the threshold beyond which a population will cease to be viable. The upper limit could be the point at which a population threatens another important population, or where a population becomes so large that it compromises the habitat that supports it.
168. Even if a viability threshold is known, it would be very unlikely that a manager would set a limit close to a point of possible extinction. A sufficient safety margin must always be allowed to account for the possibility of unexpected changes or unforeseen impacts. In many ways, limits can be regarded as limits of confidence. When the values of all performance indicators fall within the limits, it can be confidently considered that the feature is at favourable conservation status; when the limits are exceeded, that confidence disappears.
169. Limits for ecological character features may be closely related to suitable use and carrying capacity limits. Thus, limits of human activities/interventions should also be clearly established and monitored.

Monitoring performance indicators

170. Whenever performance indicators are established they must be monitored. That is their entire purpose. The measurement of the performance indicators

provides the evidence that is used, in part, to determine the condition of the features.

171. For further guidance on indicators and monitoring, including designing a wetland monitoring programme, see Resolution VI.1 and Ramsar's *Wetland Risk Assessment Framework*, including guidance on early warning indicators (Resolution VII.10). (See Sections D and E).

Recommended structure for presenting objectives

172. Once appropriate indicators and a monitoring programme have been identified, the remaining task is to write a succinct and easily understood objective statement.
173. For each feature, begin with the description of the condition required for the feature, followed by the operational limits and the selected performance indicators, with defined limits.

XVI. Rationale

174. The rationale section of the plan is devoted to identifying and describing, in outline, the management considered necessary to maintain the site features in (or restore them to) favourable status. Decisions in this section are based on a second assessment of the factors. This time, the discussion focuses on seeking management solutions in order to bring the factors under control. Control can mean the removal, maintenance or application of factors. For example, grazing is an obvious factor for wet grassland habitats. Options to be considered here could include removing, reducing, maintaining current levels, increasing, or introducing grazing.
175. On all sites there will be a number of other responsibilities, obligations, and tasks that will need to be addressed, but which arise for reasons other than the management of features. It is important that these other obligations be included in the management plan, particularly since they can have substantial resource implications.

Compliance with legal and other obligations

176. Operational objectives need to be prepared to ensure compliance with legal and other national obligations (for example, health and safety regulations). These are not strictly objectives in the same sense as the objectives which are defined for the features. They are, in fact, prescriptions, or the operations that must be carried out in a site to ensure that the prime feature objectives are met. However, for most sites it is difficult, and would be extremely cumbersome, to attempt to associate all activities with the individual feature objectives. This would be particularly repetitive when an activity is being carried out in respect of many of the features.

Management of site infrastructure and major operational and logistical support services

177. This section of the management plan is devoted to the development of operational objectives and associated management projects to ensure that an infrastructure adequate to meet the purposes of the site is provided. It will also include objectives for major operations and for support services.

For example, for many sites it will be necessary to maintain a network of access routes within the site in order to undertake the management actions to implement the plan.

XVII. Action plan (management projects and review)

Management projects

178. This section is a continuation of the rationale. In the rationale, the need for, and the nature of, possible management will have been discussed. The outcome should be an outline of the management processes considered most appropriate to safeguard each feature. The function of the management project is then to describe in detail all the management work that will be associated with each feature.
179. For each management project, it is important that the following issues be given attention:

When	when the work will be carried out and for how long
Where	where on the site activities will take place
Who	who will do the work and how much time will be required
Priority	what priority is given to the project
Expenditure	how much the work will cost

180. Once the management projects have been developed, for operational purposes it can be appropriate to compile the suite of management projects into an annual Operational Plan which is designed to guide and assist in monitoring implementation.

Planning for visitors, tourism and recreation

181. Objectives, prescriptions and management projects should be developed for public access and tourism based upon an approach similar to that used for features. Public access and tourism are taken in their widest meaning and include anyone who visits the site for any reason other than official purposes. Access and tourism can make a significant contribution towards the costs of managing Ramsar Sites. Ramsar Sites can attract significant numbers of visitors, and this can often be of considerable benefit to the local, and even national, economy. There should be a positive presumption in favour of providing access and appropriate facilities for visitors.
182. All activities carried out in a Ramsar site require planning, and the provision of interpretation is no exception. Interpretation is concerned with providing information in an attempt to enhance the visitors' experience and to help them understand, and thus appreciate, the value of the protected area's environment and its features. Interpretation is an essential tool that can be used for a variety of purposes. Interpretation is not an end in itself but a means, through influencing others, of helping to achieve organizational and site-specific objectives.

See also Handbook 6,
Wetland CEPA

183. For further guidance, see the Convention's [2009-2015] Programme on Communication, Education, [Participation] and Awareness (CEPA), adopted by Resolution [X.8] and the Convention's CEPA Web site ([www.ramsar.org/CEPA-Programme/])

Annual or short term reviews

184. A short-term review should be made to confirm that a site is being managed in accordance with the requirements of the plan.

Major review or audit

185. Major reviews or audits should be considered as an essential component of any planning process. The functions of audit are to:

- i) assess whether or not a site is being managed at least to the required standard;
- ii) confirm, as far as possible, that management is effective and efficient; and
- iii) ensure that the status of the site features is being accurately assessed.

186. The audit process is best, though not always necessarily, carried out by external auditors. It is a constructive process which should identify any problems or concerns and seek to provide recommendations for resolving any issues.

187. Reviews and audit will usually be carried out in accordance with a predetermined timetable. The interval between reviews will be a reflection of the confidence that managers have in their ability to protect the site features. For sites with robust features which are easily managed, the interval may be five years or more. However, for fragile sites, where threats are not readily controlled, the interval should be much shorter.

188. On all sites, reviews should be undertaken at any time if new or unforeseen threats become apparent. It is essential that the timing of the planning process be adjusted to meet the requirements of the site.

See also Handbook
19, Addressing
change in wetland
ecological character

189. For sites on the Ramsar List which have been included in the Montreux Record owing to recognized threats to their ecological character, a Ramsar Advisory Mission can be regarded as one form of review and/or audit.

D. Designing a monitoring programme

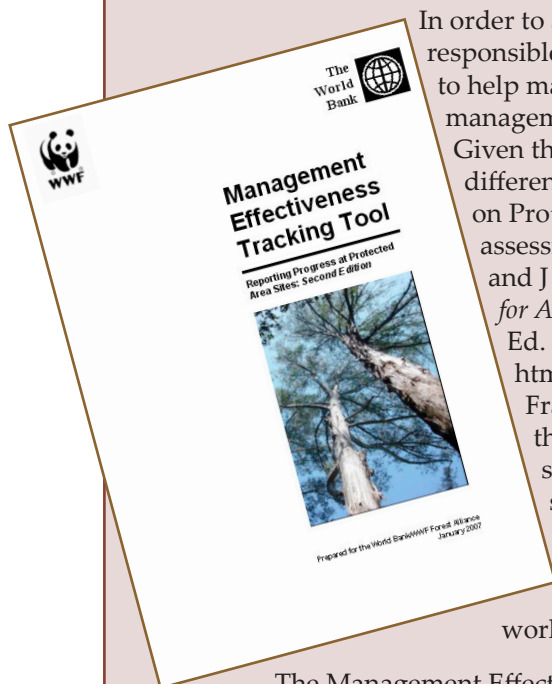
190. **A framework for designing an effective wetland monitoring programme**¹¹(see Figure 4).

- i) In order to detect actual or potential changes in ecological character, regular monitoring is required. Monitoring is defined [in the Ramsar Framework for Wetland Inventory (annex to Resolution VIII.6) as "Collection of specific information for management purposes in

¹¹ The text in paragraph [190] is taken from paragraph 2.10 of the Annex to Resolution VI.1 *Working definitions, guidelines for describing and maintaining the ecological character of Listed sites, and guidelines for operation of the Montreux Record*; [the Resolution itself is reproduced in 'Relevant Resolutions and Recommendations' in this Handbook].

Additional information

Assessing the effectiveness of wetland management planning implementation: management effectiveness frameworks and tracking tools (METT)



In order to assist managers of protected areas, including those responsible for wetlands, a number of tools have been developed to help managers assess and respond to the effectiveness of their management planning processes and their implementation. Given that the wide range of situations and needs require different methods of assessment, the IUCN World Commission on Protected Areas (WCPA) has developed a 'framework' for assessment (Hockings, M, S Stolton, F Leverington, N Dudley and J Courrau (2006); *Assessing Effectiveness – A Framework for Assessing Management Effectiveness of Protected Areas*; 2nd Ed. IUCN, Switzerland, [<http://data.iucn.org/dbtw-wpd/html/bp14-evaluatingeffectiveness/cover.html>]) This Framework aims both to provide some overall guidance in the development of assessment systems and to encourage standards for assessment and reporting. This and the more specific tracking tools provide managers and countries with mechanisms to assess their progress in meeting commitments under both the Ramsar Convention and the Convention on Biological Diversity's Programme of work on Protected Areas and its targets.

The Management Effectiveness Tracking Tool (METT) (http://assets.panda.org/downloads/mett2_final_version_july_2007.pdf) is designed to track and monitor progress towards worldwide protected area management effectiveness. It is aimed at being cheap and simple site level tool to use by park staff, while supplying consistent data about protected areas and management progress over time.

The Tracking Tool aims to:

- Identify progress on management effectiveness of protected areas;
- Provide baseline data on a protected area portfolio and assist with reporting and accountability;
- Identify portfolio trends and priorities for the development of appropriate tools and policies;
- Identify key management issues in a specific protected area and how to resolve these issues; and
- Identify appropriate follow-up steps, particularly at the site level.

The METT has been developed to help track and monitor progress in the achievement of the World Bank/WWF Alliance portfolio. It is now obligatory for all Global Environment Facility (GEF) protected area projects and has been used to develop a basic management effectiveness evaluation tool for several national protected area systems. It has been applied for many 'terrestrial' protected areas worldwide including some wetlands and Ramsar Sites.

In addition, there are several management effectiveness assessment tools which have been developed specifically for marine protected areas (MPA) and which are thus relevant to coastal and nearshore marine Ramsar Sites and other wetlands. These include:

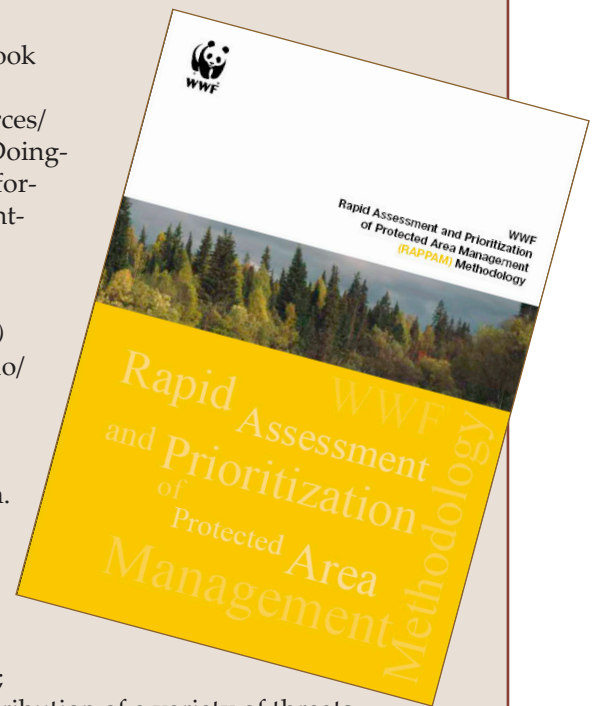
- The World Bank “Score Card to assess progress in achieving management effectiveness for marine protected areas – a short self-assessment tool for managers” (http://www.icriforum.org/mpa/SC2_eng_nocover.pdf?bcsi_scan_EC783A0C3C997A81=0&bcsi_scan_filename=SC2_eng_nocover.pdf); and
- The more detailed IUCN-WCPA marine guidebook *How is your MPA doing?* (http://www.iucn.org/about/work/programmes/marine/marine_resources/marine_publications/?1256/How-is-Your-MPA-Doing-A-Guidebook-of-Natural-and-Social-Indicators-for-Evaluating-Marine-Protected-Areas-Management-Effectiveness)

In addition, another tool, *The Rapid Assessment and Prioritization of Protected Areas Management (RAPPAM) methodology* (see http://www.panda.org/what_we_do/how_we_work/conservation/forests/tools/rappam/) provides protected areas agencies with a country-wide overview of the effectiveness of protected area management, threats, vulnerabilities and degradation. It provides follow-up recommendations, and is an important first step in assessing and improving protected area management.

RAPPAM can:

- Identify management strengths and weaknesses;
- Analyse the scope, severity, prevalence, and distribution of a variety of threats and pressures;
- Identify areas of high ecological and social importance and vulnerability;
- Indicate the urgency and conservation priority for individual protected areas; and
- Help to develop and prioritize appropriate policy interventions and follow-up steps to improve protected area management effectiveness.

The most thorough and effective approach to implementing RAPPAM methodology is by holding an interactive workshop or series of workshops in which protected area managers, policy makers, and other stakeholders participate fully in evaluating the protected areas, analyzing the results, and identifying subsequent next steps.



response to hypotheses derived from assessment activities, and the use of these monitoring results for implementing management. (Note that the collection of time-series information that is not hypothesis-driven from wetland assessment should be termed *surveillance* rather than monitoring, as outlined in Resolution VI.1.)”]

- ii) The Additional Guidance [for the implementation of the wise use concept (Annex to Resolution 5.6)] also points out that monitoring does not automatically require sophisticated technology or high investment and can be carried out at different levels of intensity. It is emphasised that there are many different monitoring techniques available and that each

Contracting Party should select the technique(s) most appropriate to its priorities and available resources.

- iii) A monitoring programme should, ideally, be an integral part of a site-specific wetland management plan, as set out in Resolution VIII.14 (see Section C of this Handbook). However, where a management plan does not yet exist, it is still possible to implement a monitoring programme (though without the framework of a management plan, it will be difficult to implement the results of monitoring effectively).

- 191. When a monitoring programme detects a human-induced change or likely change in the ecological character of a Ramsar Listed wetland, under Article 3.2 of the Convention, the Contracting Party is expected to report this, without delay, to the Ramsar [Secretariat] (see also Handbook [19]).

E. Wetland Risk Assessment Framework

Relevant implementation commitments made by Contracting Parties in COP Resolutions

Resolution VII.10: Wetland Risk Assessment Framework

THE CONFERENCE OF THE CONTRACTING PARTIES

- 13. CALLS UPON Contracting Parties to ensure that their preparation of management plans for sites included in the Ramsar List and other wetlands includes, as an integrated element, early warning indicators as part of a monitoring programme based on the framework adopted by Resolution VI.1

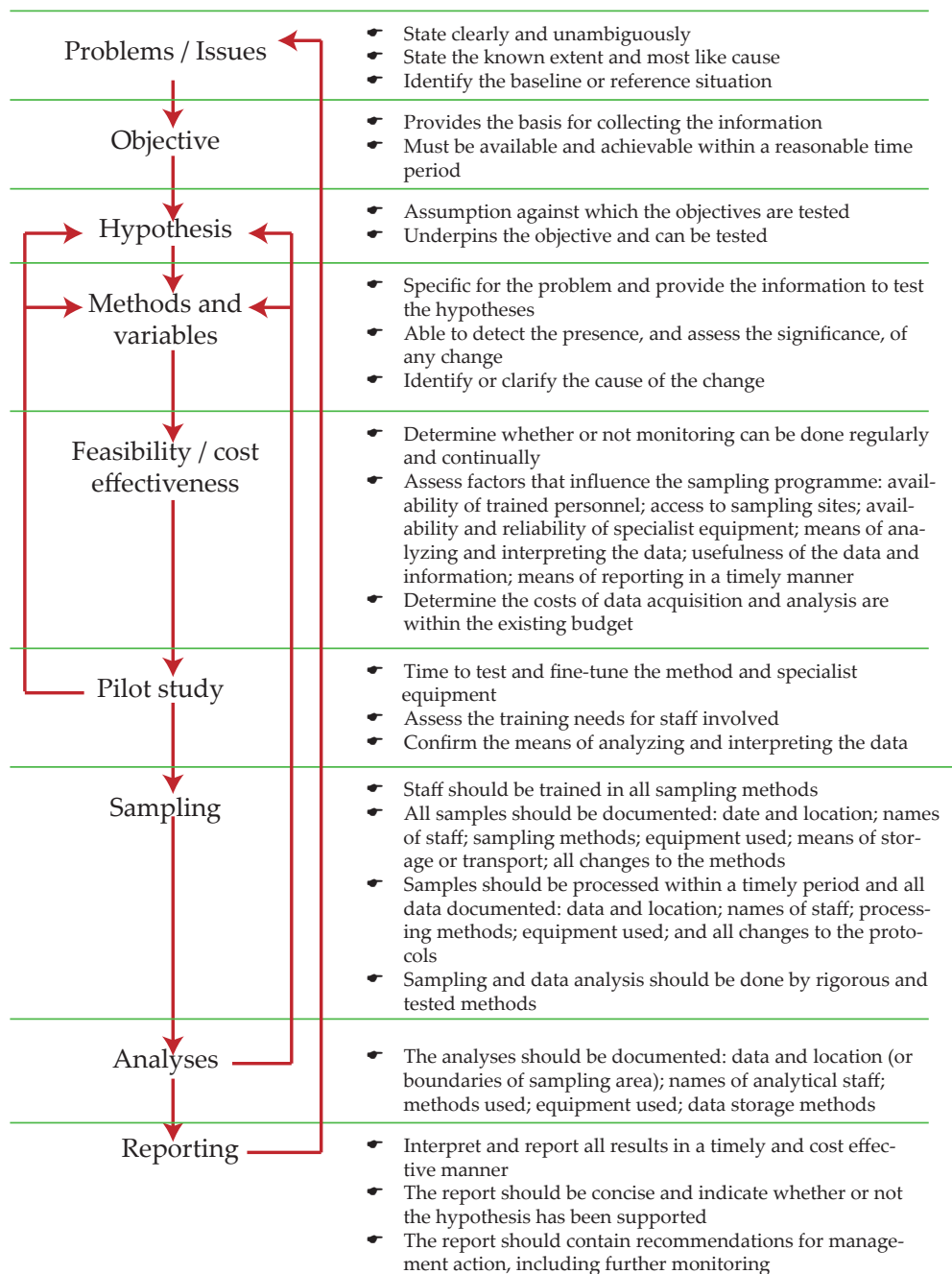
- 192. The Annex to Resolution VII.10 (see “Relevant Resolutions and Recommendations” for the Resolution itself), adopted by Ramsar COP7, provides Contracting Parties with a *Wetland Risk Assessment Framework*. The Annex is reproduced here although readers should note that the paragraph and Figure numbers which follow reflect the current document and not the original.

Introduction

- 193. The Convention on Wetlands (Ramsar, Iran, 1971) has developed this conceptual framework for wetland risk assessment to assist its Contracting Parties with predicting and assessing change in ecological character of the sites included in the List of Wetlands of International Importance and other wetlands. This Framework provides guidance on how to go about predicting and assessing change in the ecological character of wetlands and promotes, in particular, the usefulness of early warning systems. The Wetland Risk Assessment Framework is presented as an integral component of the management planning processes for wetlands.
- 194. The Ramsar Convention’s processes for assessing and maintaining the ecological character of wetlands comprise many elements and are central to the Convention’s concept of wise use and to the obligations of Contracting Parties under the treaty. These elements include:

Figure 4. Framework for designing a wetland monitoring programme

The framework set out here (taken from the Annex to Resolution VI.1) is not a prescriptive recipe for any particular monitoring programme. It simply provides a series of steps, in a logical sequence, that can be used by wetland managers and planners, working in partnership with local users and managers, to design a monitoring programme based on their particular circumstances and needs. The arrows illustrate the feedback which enables assessment of the effectiveness of the monitoring programme in achieving its objective(s). This framework is based on a text entitled *A Framework for Designing a Monitoring Programme* (Finlayson, 1995) prepared for the *MedWet Methodological Guide for Monitoring Programmes in Mediterranean Wetlands*.



Additional information

How Earth Observation can help wetland managers: the TESEO and GlobWetland experience

The European Space Agency's (ESA), TESEO-wetlands project, 2000-2002 (Treaty Enforcement Service Using Earth Observation) aimed at exploring the capabilities of Earth Observation (EO) technology to support wetland managers in their daily work.



Wetland managers of three different Ramsar Sites, Parque Nacional de Doñana (Spain), Mer Blue Conservation Area (Canada) and Djoudj (Senegal) were directly involved in the project. In particular, they were responsible for defining their information requirements, supporting the development of specific geo-information products to fulfil those requirements and validating and assessing the final results.

Specifically, the following products have been developed for the three Ramsar Sites:

- open water and flooded vegetation monitoring;
- land-cover and land-cover change;
- land use.

The methodological approach used to generate the above products and the operational viewpoint of the user are summarised here.

1. Open water and flooded vegetation monitoring:

Synthetic Aperture Radar (SAR) is an excellent sensor for detecting open water. It presents also excellent capabilities for detecting flooded vegetation, which appears very bright on radar imagery. These characteristics were used to map areas of open water and flooded vegetation over time.

This product can be used by wetland managers to map seasonal changes in water extent on a yearly basis. Wetland managers recognised that a monitoring effort such as this must be carried out regularly during the years. In particular, the information provided by this product during the first few years will be needed to establish a range of normal conditions from which deviations and trends can be detected. Since water is the lifeblood of a wetland, this product is very significant.

2. Land cover and land cover change

The use of EO data for land cover monitoring is well developed, although techniques need to be tailored to specific circumstances. The approach used to Land Cover mapping consisted of exploiting traditional semi-automatic image classification techniques (spectral clustering) applied to multispectral optical data (Landsat 7). For each test site, a Land Cover map for the wetland itself was generated as well as an additional Land Cover map outside the wetland area using a different set of classes.

According to the feedback received from wetland managers, this product gives useful information for wetland inventory and assessment. As more data is collected for each site, cost savings will result by having data banks of ground control points and training areas, and knowledge of the wetland will increase.

For Land Cover Change, a classical image-differencing approach was used that has been known by specialists for a long time. This approach identifies changes by comparing, pixel by pixel, two co-registered images acquired over the wetland area at different times.

Many of the changes identified in the three test sites can be explained by new urban developments, change in the vegetation condition, conversion of natural land and water courses to agriculture or salt fields (e.g., in Doñana), or abandonment of farmlands.

This approach can be used to show historical changes since archive EO data is available from the 1970s. In particular, a regular change analysis can be used as a screening tool to alert wetland stakeholders and managers to areas where change is taking place, identify the general nature of the changes, and help determine when updated Land Cover or Land Use maps need to be produced.

3. Land Use

The Land Use product shows wetlands manager potential threats to the wetland from influences in the remainder of the catchment area, such as industry, residential developments, or transportation. Land Use typically requires EO products with greater spatial detail than does Land Cover. To create this detailed image, we merged data from the HRG sensor of the SPOT-5 satellite (2.5 metre panchromatic) with multispectral Landsat ETM+ data (30 m resolution). The panchromatic image provided details and texture, while the multispectral data showed vegetation information with much greater apparent detail than the original Landsat image. This “pan-sharpened multispectral” image was visually interpreted to create a Land Use map.



Detail of the land use map generated for Doñana. The different gray levels correspond to different land use types ranging from artificial salt fields and irrigated croplands to urban areas and rice fields. Image by Atlantis Scientific Inc., courtesy ESA.

In order to validate all of these products, the TESEO team worked in close collaboration with the wetland managers. In addition, different airborne data collection campaigns were organised over the wetlands in the project and hundreds of photographs were taken. The validation and the final assessment of the products carried out by the users demonstrated both the reliability of the information provided and the benefits that EO technology can bring to wetland managers.

Building on the TESEO experiences, to follow up and extend this approach to a wider range of wetland types, management situations and needs, the ESA initiated the GlobWetland Project in 2003, aimed at providing support to wetland planners and managers for 50 Ramsar Sites, and generating standard products which can be applied in the management of a broad range of wetlands worldwide. This has been followed by a GlobWetland-II project focussing on coastal wetlands in the southern and eastern part of the Mediterranean Basin.

For further information on the project, readers are referred to Ramsar COP8 DOC. 35 *The use of Earth Observation technology to support the implementation of the Ramsar Convention*, available at [http://www.ramsar.org/cda/ramsar/display/main/main.jsp?zn=ramsar&cp=1-31-58-128^17415_4000_0__] on the Convention’s Web site. Further information on the Globwetland project is available on: <http://www.globwetland.org/>.

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European Space Agency
<http://www.esa.int>

- a) the Criteria for identifying Wetlands of International Importance (Resolution VII.11);
- b) the Montreux Record of Ramsar Sites where changes in ecological character have occurred, are occurring, or are likely to occur (Resolution 5.4); and
- c) the *Working definitions, Guidelines for describing and maintaining the ecological character of listed sites, and Guidelines for operation of the Montreux Record* (Resolution VI.1).

See also Handbook 19, Addressing change in wetland ecological character

195. Resolution VI.1, adopted at the 6th Conference of the Contracting Parties to the Convention in 1996, also presented a framework for designing an effective wetland monitoring programme and called for the development of appropriate early warning systems for detecting adverse change and for assessment of the working definitions of “ecological character” and “change in ecological character”. In the triennium that followed, these working definitions were reviewed and amended as shown in Resolution VII.10 which also adopt[ed] this *Wetland Risk Assessment Framework*.

Types of change in ecological character

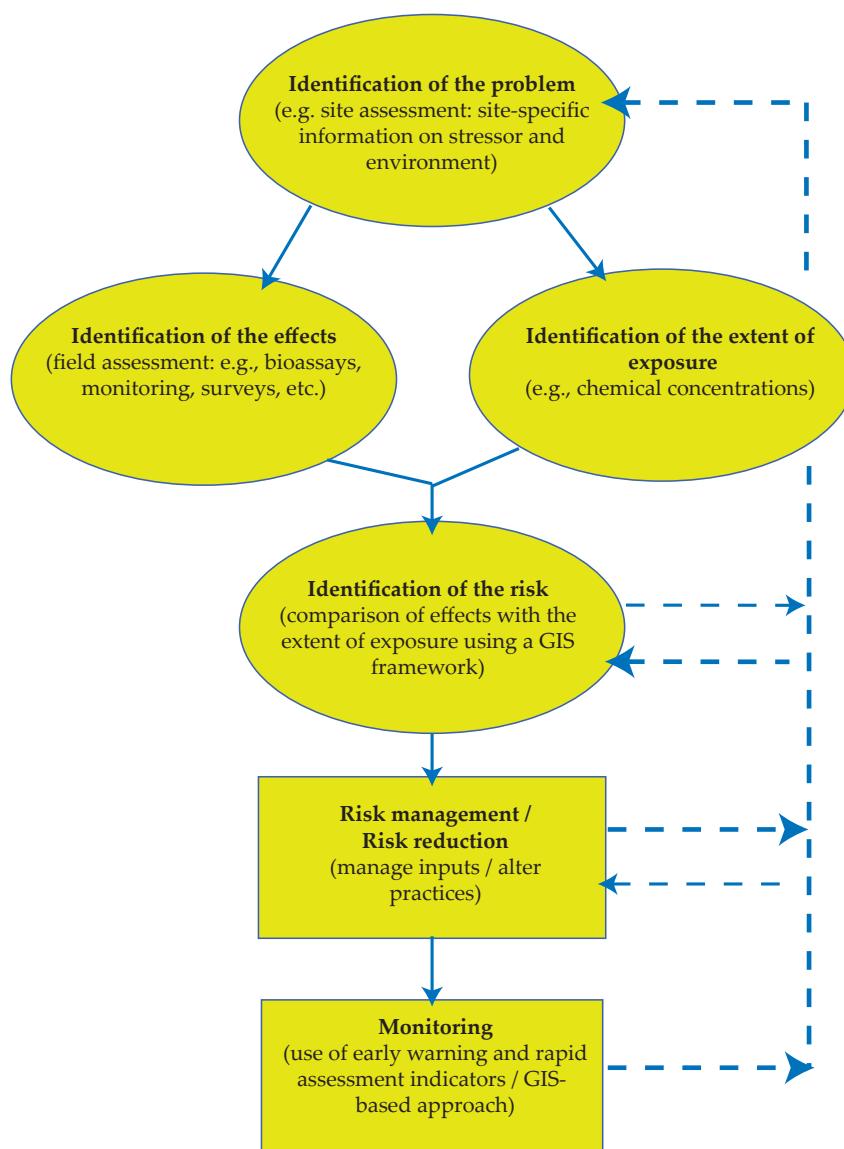
196. The causes of adverse change in the ecological character of a wetland can be grouped in five broad categories:
- a) changes to the water regime;
 - b) water pollution;
 - c) physical modification;
 - d) exploitation of biological products; and
 - e) introduction of exotic species.
197. The relative importance of these causes varies regionally, nationally and even from site to site. In addition, the above causes of change are often inter-linked, and it can be difficult to separate the effects of each of them. A simpler way to view change in ecological character is by the type of change as opposed to the cause of change. In [the context of] the definition of change in ecological character (refer to paragraph [19] of Resolution [IX.1 Annex A] and paragraph 9 of this Handbook), the type of change can be considered under three general headings – biological, chemical and physical.
198. In outlining an appropriate framework and methods for the prediction of change in ecological character of wetlands, site managers are primarily concerned with types of change. Specifically, they are concerned with adverse change caused by human activity.

Wetland Risk Assessment

199. To ensure the appropriate application of early warning indicators, it is essential that the processes of selecting, assessing, analysing and basing decisions on indicator responses be contained within a structured but flexible form of assessment framework. In the context of the Ramsar Convention, a modified ecological risk assessment framework, termed wetland risk assessment, is encouraged. The framework aims to outline how Wetland Risk Assessment can act as the ‘vehicle’ for driving the process of predicting and assessing change in ecological character, with a particular emphasis on the application of early warning techniques.

200. A basic model for wetland risk assessment, modified from a generalised ecological risk assessment paradigm, is shown in Figure 5. It outlines six steps that are described in the following paragraphs.
201. **Step 1 - Identification of the problem.** This is the process of identifying the nature of the problem and developing a plan for the remainder of the risk assessment based on this information. It defines the objectives and scope of, and provides the foundation for, the risk assessment. In the case of a chemical impact, it would include obtaining and integrating information on the characteristics (for example, properties, known toxicity) and source of the chemical, what is likely to be affected, and how is it likely to be affected, and importantly, what is to be protected.
202. **Step 2 - Identification of the adverse effects.** This step evaluates the likely extent of adverse change or impact on the wetland. Such data should preferably be derived from field studies, as field data are more appropriate for assessments of multiple impacts, such as occur on many wetlands. Depending on the extent of adverse change and available resources, such studies can range from quantitative field experiments to qualitative observational studies. For chemical impacts, on-site ecotoxicological bioassays constitute appropriate approaches, whereas for changes caused by weeds or feral animals, on-site observation and mapping may be all that is required.
203. **Step 3 - Identification of the extent of the problem.** This step estimates the likely extent of the problem on the wetland of concern by using information gathered about its behaviour and extent of occurrence elsewhere. In the case of a chemical impact, this includes information on processes such as transport, dilution, partitioning, persistence, degradation, and transformation, in addition to general chemical properties and data on rates of chemical input into the environment. In the case of an invasive weed, it might include detailed information on its entry into an ecosystem, rate of spread and habitat preferences. While field surveys most likely represent the ideal approach, use of historical records, simulation modeling, and field and/or laboratory experimental studies all represent alternative or complementary methods of characterising the extent of the problem.
204. **Step 4 - Identification of the risk.** This involves integration of the results from the assessment of the likely effects with those from the assessment of the likely extent of the problem, in order to estimate the likely level of adverse ecological change on the wetland. A range of techniques exists for estimating risks, often depending on the type and quality of the likely effects and their extent. A potentially useful technique for characterising risks in wetlands is via a GIS-based framework, whereby the results of the various assessments are overlaid onto a map of the region of interest in order to link effects to impact. In addition to estimating risks, such an approach would also serve to focus future assessments and/or monitoring on identified problem areas.
205. **Step 5 - Risk management and reduction.** This is the final decision-making process and uses the information obtained from the assessment processes described above, and it attempts to minimise the risks without compromising other societal, community or environmental values. In the context of the Ramsar Convention, risk management must also

Figure 5. Suggested model of wetland risk assessment



consider the concept of wise use and the potential effects of management decisions on this. The result of the risk assessment is not the only factor that risk management considers; it also takes into account political, social, economic, and engineering/ technical factors, and the respective benefits and limitations of each risk-reducing action. It is a multidisciplinary task requiring communication between site managers and experts in relevant disciplines.

206. **Step 6 - Monitoring.** Monitoring is the last step in the risk assessment process and should be undertaken to verify the effectiveness of the risk management decisions. It should incorporate components that function as a reliable early warning system, detecting the failure or poor performance of risk management decisions prior to serious environmental harm occurring. The risk assessment will be of little value if effective monitoring is not undertaken. The choice of endpoints to measure in the monitoring process is

critical. Further, a GIS-based approach will most likely be a useful technique for wetland risk assessment, as it incorporates a spatial dimension that is useful for monitoring adverse impacts on wetlands.

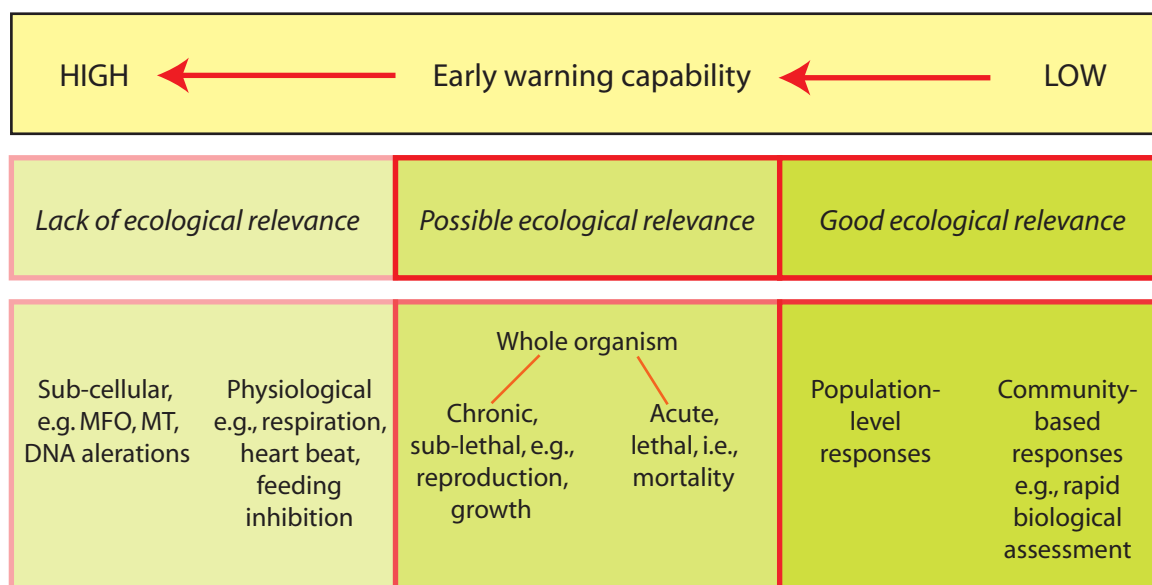
Early warning indicators

207. The underlying concept of early warning indicators is that effects can be detected, which are in fact, precursors to, or indicate the onset of, actual environmental impacts. While such 'early warning' may not necessarily provide firm evidence of larger scale environmental degradation, it provides an opportunity to determine whether intervention or further investigation is warranted. As such, early warning indicators can be defined as 'the measurable biological, physical or chemical responses to a particular stress, preceding the occurrence of potentially significant adverse effects on the system of interest'.
208. Of the five major types of change in ecological character described in paragraph 196 above, chemical change has received by far the most attention in terms of its environmental impacts and their prediction. As a result, the vast majority of early warning techniques have been developed to assess the impacts of chemicals on aquatic ecosystems. It is recommended that further assessments be carried out to identify appropriate indicators for the other major types of change in ecological character. Examples of early warning indicators included in this Framework mostly represent biological and physico-chemical assessment approaches to predict or forewarn of important chemical changes (that is, pollution) on wetlands.
209. The choice of indicators follows a hierarchy of other decisions required by managers in setting up monitoring programmes to assess ecosystem health. Thus, after identifying the issue of concern or potential concern and determining the environmental values to be protected, managers should then be concerned with identifying assessment objectives for protection of the wetland. As an example, the following can be used:
 - a) Early detection of acute and chronic changes, providing pre-emptive information so that ecologically important impacts are avoided.
 - b) Assessing the ecological importance of impact through measurement of biodiversity, conservation status and/or population, community or ecosystem-level responses.
210. To determine effects upon the ecosystem as a whole – or the ecological importance of effects that are observed – measurement of ecosystem 'surrogates' is usually required. Typically these surrogates are communities or assemblages of organisms, or habitat or keystone-species indicators where these have been closely linked to ecosystem-level effects. Information on the ecological importance of adverse effects is best met in programmes that have regional or national coverage and that encompass a full disturbance gradient, that is, covering a range of sites that have not been degraded to those that have been severely degraded. Rapid assessment methods can provide this context.
211. In selecting an indicator it is important to be mindful of the definition of the ecological character of a wetland (refer to paragraph [15] of Resolution [IX.1 Annex A] [...]). It may be useful to select early warning indicators

according to which of the [biological, chemical and physical] components [of the ecosystem] is/are considered more susceptible to change. The three components are intricately linked. Although these interactions exist, the Wetland Risk Assessment Framework provides a process to assist in identifying the most appropriate indicators to assess or predict change.

212. The ecological relevance of an early warning indicator should be considered. However, the concepts of early warning and ecological relevance can conflict. The types of biological responses that can be measured, and their relationship to ecological relevance and early warning capability, is generalised in Figure 6. As an example, biomarker responses can offer exceptional early warning of potential adverse effects, but there exists very little evidence that observed responses result, or culminate in adverse effects at an individual level, let alone the population, community or ecosystem level. Therefore, they cannot be considered ecologically relevant. If the primary assessment objective is that of early detection, then it is likely that it will be at the expense of ecological relevance, while the opposite would probably apply if knowledge of the ecological significance of effects was considered.

Figure 6. Relationship of ecological relevance and early warning capability to measurable biological responses



Ideal attributes of early warning indicators

213. To have potential as an early warning indicator, a particular response should be:
- a) **anticipatory**: it should occur at levels of organization, either biological or physical, that provide an indication of degradation, or some form of adverse effect, before serious environmental harm has occurred;

- b) **sensitive:** in detecting potential significant impacts prior to them occurring, an early warning indicator should be sensitive to low levels, or early stages of the problem;
 - c) **diagnostic:** it should be sufficiently specific to a problem to increase confidence in identifying the cause of an effect;
 - d) **broadly applicable:** it should predict potential impacts from a broad range of problems;
 - e) **correlated to actual environmental effects/ecological relevance:** an understanding that continued exposure to the problem, and hence continued manifestation of the response, would usually or often lead to significant environmental (ecosystem-level) adverse effects;
 - f) **timely and cost-effective:** it should provide information quickly enough to initiate effective management action prior to significant environmental impacts occurring, and be inexpensive to measure while providing the maximum amount of information per unit effort;
 - g) **regionally or nationally relevant:** it should be relevant to the ecosystem being assessed;
 - h) **socially relevant:** it should be of obvious value to, and observable by stakeholders, or predictive of a measure that is socially relevant;
 - i) **easy to measure:** it should be able to be measured using a standard procedure with known reliability and low measurement error;
 - j) **constant in space and time:** it should be capable of detecting small change and of clearly distinguishing that a response is caused by some anthropogenic source, not by natural factors as part of the natural background (that is, high signal to noise ratio);
 - k) **nondestructive:** measurement of the indicator should be nondestructive to the ecosystem being assessed.
214. The importance of the above attributes cannot be over-emphasised, since any assessment of actual or potential change in ecological character will only be as effective as the indicators chosen to assess it. However, an early warning indicator possessing all the ideal attributes cannot exist, as in many cases some of them will conflict, or will simply not be achievable.

Examples of early warning indicators

215. A number of early warning indicators have been developed for the assessment of wetland ecosystems. These are placed into three broad categories:
- a) rapid response toxicity tests;
 - b) field early warning tests; and
 - c) rapid assessments.
216. A general description of these, including potential limitations, is outlined in Table 1. Each of the techniques may meet different objectives in water quality assessment programs. Although the majority of early warning indicators are

of a biological nature, physico-chemical indicators do exist and often form the initial phase of assessing water quality.

Table 1: Role and possible limitations of types of early warning indicators

Type of response and role	Potential limitations
<p>a. Rapid response toxicity tests Laboratory toxicity assessment of sensitive whole organism responses (for example, growth, reproduction) with rapid turn-around of results. They are predictive tests that potentially enable timely and flexible management actions (for example determining a safe dilution for discharge of effluents of changing composition) to be implemented.</p>	Ecological relevance of measured sub-lethal responses (for example, growth, reproduction) has generally not been established.
<p>b. Field early warning tests Field measurement of sensitive sub-lethal organism responses through monitoring or assessment. They can provide pre-emptive or preventative information so that substantial and ecologically important impacts are avoided.</p>	Ecological relevance of measured responses (especially biochemical biomarkers) has generally not been established.
<p>c. Rapid assessments Standardised, rapid and cost-effective monitoring of various forms can provide 'first-pass' assessment of the ecological condition of sites over large areas. Broad coverage has potential to identify 'hot spots' and hence pre-empt and prevent similar occurrences elsewhere.</p>	Output is usually coarse and generally only detects relatively severe impacts.

Rapid response toxicity tests

217. These represent laboratory toxicity bioassays designed to provide rapid and sensitive responses to one or more chemicals. They provide an indication that there may be a risk of adverse effects occurring at higher levels of biological organization (for example, communities and ecosystems). Laboratory toxicity tests are of particular use for a chemical or chemicals yet to be released into the aquatic environment (for example, a new pesticide or a pre-release waste water). They provide a basis upon which to make decisions about safe concentrations or dilution/release rates, thereby eliminating, or at least minimising, adverse impacts on the aquatic environment. However, there are major differences in the ecological relevance of responses that can be measured.

Early warning field tests

218. This group comprises a range of techniques that are grouped because they are used to measure responses or patterns in the field and thus provide a more realistic indication of effects in the environment. In contrast to laboratory rapid response toxicity tests, early warning field tests predict and/or assess the effects of existing chemicals. Some of the techniques can also be applied to biological and physical problems.
219. **Direct toxicity assessment.** This is the use of toxicity tests to assess and monitor the consequences of chemicals in aquatic ecosystems (for example, waste water releases, contamination of waterways with pesticides and other

agricultural chemicals). In situ toxicity assessment of a waterbody receiving a pollutant input serves to monitor the effectiveness of predictions based on the rapid response toxicity tests described above (paragraph 217). However, assuming the measured responses are sensitive, results can also provide early warning of potential impacts at higher levels of biological organization.

220. **Phytoplankton monitoring.** Due to their nutritional requirements, their position at the base of aquatic food webs, and their ability to respond rapidly and predictably to a broad range of pollutants, phytoplankton represent perhaps the most promising early warning indicators of change in ecological character of wetlands due to chemicals. In addition, their sensitivity to changes in nutrient levels makes them ideal indicators for assessing eutrophication. They can be used in the types of toxicity bioassays described above, for rapid response toxicity tests and direct toxicity assessment. Such methods are rapid, inexpensive and sensitive, and can be carried out in the laboratory or in the field, using either laboratory cultured algae or natural phytoplankton assemblages. For example, algal fractionation bioassays (AFB) assess the effects of pollutants on the functional parameters (for example, C14 uptake, biomass) within various size fractions of a natural assemblage of algae. Structural indicators, such as species composition and size assemblage shifts have also been found to be particularly sensitive.
221. **Biomarkers.** These can be defined as biochemical, physiological, or histological indicators of either exposure to, or effects of, particular chemicals at the sub-organismal or organismal level. The underlying concept is that changes to the biochemistry, physiology or histology of individual organisms often precede effects at the organismal and therefore, potentially, population, community and ecosystem level. Briefly, aquatic animals are collected from the site(s) of interest and a reference site, and the biomarkers assessed and compared. A modification of this is to place 'caged' micro-organisms in the environment of interest, and to measure biomarker responses following a pre-determined period of time. Biomarkers have been used to predict potential adverse effects of a number of pollutant types, including organic chemicals such as pesticides and petroleum hydrocarbons, heavy metals, and complex mixtures (for example, industrial effluents).
222. Three potentially useful types of biomarkers are mixed function oxidase, vitellogenin which is a biomarker of potential endocrine disruption, and bioaccumulation. Many biomarkers have been demonstrated to give early warning of potential adverse environmental effects of particular chemicals or complex effluents. They provide the most advanced form of biological early warning.

Rapid assessments

223. These are increasingly being used for water quality monitoring, having the appeal of enabling ecologically-relevant information to be gathered over wide geographical areas in a standardised fashion and at relatively low costs. The trade-off in these virtues is that rapid assessment methods are usually relatively 'coarse' and hence are not designed to detect subtle impacts. Desired or essential attributes of rapid assessment include:

- a) measured response is widely regarded as adequately reflecting the ecological condition or integrity of a site, catchment or region (that is, ecosystem surrogate);
- b) approaches to sampling and data analysis are highly standardised;
- c) response is measured rapidly, cheaply and with rapid turnaround of results;
- d) results are readily understood by non-specialists; and
- e) response has some diagnostic value.

See also Ramsar
Technical Report 1

224. A range of rapid assessment approaches is being developed. These include rapid biological assessment using invertebrates, monitoring of birdlife, and remote sensing. These all have particular applications and in many cases still require further development.
225. Physico-chemical monitoring has also been recognized as being a vital component of an integrated assessment programme that utilises biological measures for assessing the condition of waterways. The monitoring of standard physico-chemical parameters can be of use in several ways. Firstly, it provides a record of the physico-chemical characteristics of the waterbody, which when continued over an extended period, provides a record of the variation in the characteristics over time. Secondly, many physico-chemical parameters have the ability to alter the toxicity of particular pollutants. The majority of standard physico-chemical water quality parameters are simple, inexpensive and quick to measure, and should be used to complement any ecotoxicological or biological monitoring study.

Responsiveness of early warning indicators

226. Acceptance of the need for early warning indicators in a monitoring programme implies that information on early change is acted upon and an agreed management plan is in place. The initial stages of this management plan may entail a series of iterations amongst negotiating stakeholders about the type and size of the change that are deemed important, as well as the relative costs of inferring that there is an impact when in fact there is none, and of failing to detect a real impact. These are important statistical parameters that must be agreed, as they stipulate the confidence with which the results of the monitoring are accepted.
227. Inclusion of early warning indicators in a monitoring programme implies a precautionary management approach, that is, intervention before real and important ecosystem-level changes have occurred. Intervention in response to changes in an early warning indicator, therefore, occurs at some conservative and generally arbitrary threshold or trigger value in the measured response.
228. The most powerful impact assessment programmes will generally be those that include two types of indicator, namely those associated with early warning of change and those (regarded as) closely associated with ecosystem-level effects. The 'ecosystem-level'-type indicator might include ecologically important populations (for example, keystone species) or habitat, or communities of organisms that serve as suitable ecosystem 'surrogates'. Indicators used in rapid assessment would also normally serve this role. With both types of indicators measured in a monitoring programme, information provided by 'ecosystem-level' indicators may then

be used to assess the ecological importance of any change observed in an early detection indicator.

229. Just as for early warning indicators, thresholds of change and other statistical decision criteria for the 'ecosystem-level' indicators must also be negotiated and decided upon in advance. Specific decisions on thresholds of change are an issue that can only be dealt with effectively on a site-specific basis, whilst taking account of the ecological values and wise use of the site.



The Columbia Wetlands Ramsar site, Canada, 2007. Photo: Blair Hammond, Canadian Wildlife Service, Environment Canada.

Appendix I

Guiding principles for taking into account the cultural values of wetlands for the effective management of sites

(Annex to COP8 Resolution VIII.19)

General principles

1. This document proposes a number of general principles for identifying, preserving and reinforcing the cultural values of wetlands, which could be supplemented with additional ones at future meetings of the Conference of the Parties as more knowledge and experience are obtained. Some of them may overlap, but this is only natural as cultural values are often related and require an integrative approach.
2. There is a strong link between wetland conservation and benefits to people. In addition, a positive correlation between conservation and the sustainable use of wetlands has been repeatedly demonstrated. Therefore, conservation requires the involvement of indigenous peoples and local communities and cultural values offer excellent opportunities for this.

Guiding principle 1 – To identify the cultural values and relevant associated partners.

Guiding principle 2 - To link the cultural aspects of wetlands with those of water.

Guiding Principle 3 - To safeguard the wetland-related cultural landscapes.

Guiding principle 4 - To learn from traditional approaches.

Guiding principle 5 – To maintain traditional sustainable self-management practices.

Guiding principle 6 – To incorporate cultural aspects in educational and interpretive activities in wetlands.

Guiding principle 7 – To take into account culturally appropriate treatment of gender, age and social role issues.

Guiding principle 8 – To bridge the differences of approach between natural and social sciences.

Guiding principle 9- To mobilise international cooperation in matter of culture issues related to wetlands.

Guiding principle 10 – To encourage research on palaeoenvironmental, palaeontological, anthropological and archaeological aspects of wetlands.

Guiding principle 11 – To safeguard wetland-related traditional production systems.

Guiding principle 12 – To protect historical structures in wetlands or closely associated with them.

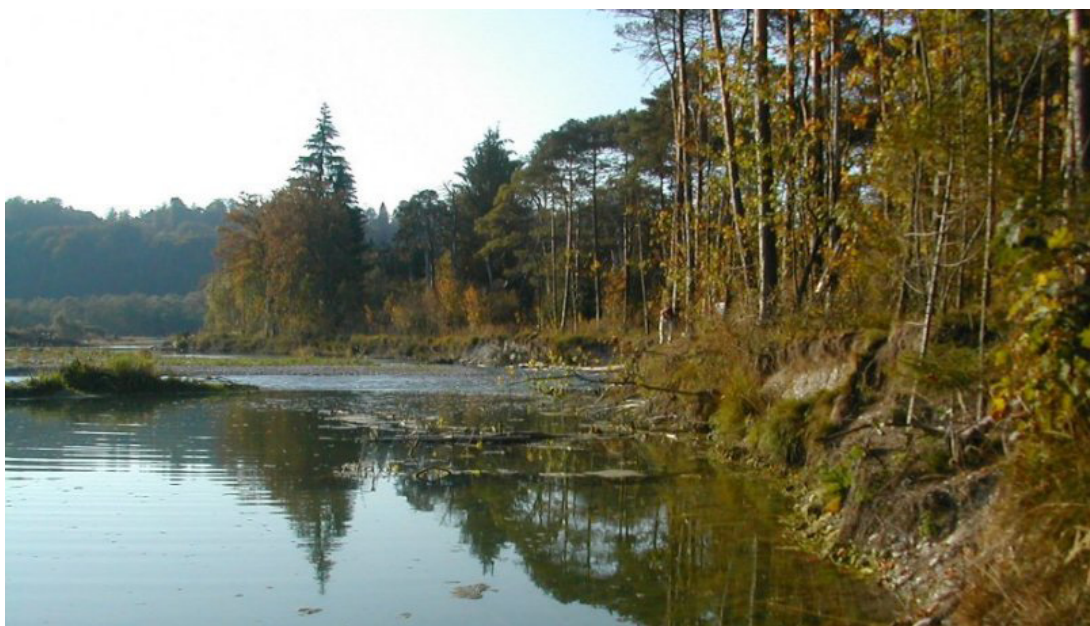
Guiding principle 13 – To protect and preserve wetland-related artefacts (mobile material heritage).

Guiding principle 14 – To preserve collective water and land use management systems associated with wetlands.

Guiding principle 15 – To maintain traditional sustainable practices used in and around wetlands, and value the products resulting from these practices.

Guiding principle 16 – To safeguard wetland-related oral traditions.

- Guiding principle 17 – To keep traditional knowledge alive.
- Guiding principle 18 – To respect wetland-related religious and spiritual beliefs and mythological aspects in the efforts to conserve wetlands.
- Guiding principle 19 – To use the arts to promote wetland conservation and interpretation.
- Guiding principle 20 – To incorporate cultural aspects, where available, in the Ramsar Information Sheet (RIS) for the description of Wetlands of International Importance, whilst ensuring the protection of traditional rights and interests.
- Guiding principle 21 – To incorporate the cultural aspects of wetlands in management planning.
- Guiding principle 22 – To include cultural values in wetland monitoring processes.
- Guiding principle 23 – To consider the use of institutional and legal instruments for conservation and protection of cultural values in wetlands.
- Guiding principle 24 – To integrate cultural and social criteria into environmental impact assessments.
- Guiding principle 25 – To improve wetland-related communication, education and public awareness (CEPA) in the matter of the cultural aspects of wetlands.
- Guiding principle 26 – To consider the possibility of using quality labeling of sustainable traditional wetland products in a voluntary and non-discriminatory manner.
- Guiding principle 27 – To encourage cross-sectoral cooperation.



Restoration of the Pupplinger Au floodplain forest in Germany. *Photo: Tobias Salathé / Ramsar.*

Appendix II

Issues and recommendations for Contracting Parties concerning the management of sustainable fisheries in Ramsar Sites and other wetlands

(Annex to COP9 Resolution IX.4)

Note: these recommendations cover issues in both inland and coastal fisheries in wetlands within the scope of Article 1, and Ramsar Sites within the scope of Article 2.1, of the Convention.

Issue 1: Aquaculture

- Aquaculture is practiced in many Ramsar Sites and in the waters adjacent to such sites and is sensitive to social, economic and technological changes that can impact on the nature of associated wetlands. Aquaculture also carries with it many risks to the environment and to native fisheries resources, and conversion of, for example, natural mangrove systems to aquaculture can greatly reduce the total value of the ecosystem benefits/services for people.

Aquaculture (e.g. pond and cage culture) practices in Ramsar Sites or in areas that are liable to impact on Ramsar Sites should be carefully controlled. Specifically, governments are encouraged to enforce relevant national legislation, apply the provisions of the FAO Technical Guidelines for Responsible Fisheries – Aquaculture Development (FAO 1997); [available on: <ftp://ftp.fao.org/docrep/fao/003/W4493e/W4493e00.pdf>] [...], the Bangkok Declaration and Strategy for Aquaculture Development (NACA/FAO 2000); [available on: <http://www.fao.org/docrep/003/AB412E/ab412e28.htm>].

Sustainable aquaculture may be facilitated through the use of native species and genomes where possible, and the minimization of the use of chemicals and the prioritization of new sustainable technologies for aquaculture.

Issue 2: Rice cultivation

- Rice cultivation is sustainably practised at many Ramsar Sites, and there are opportunities to improve the total yield of such areas by “rice-fish” systems in these and other wetlands cultivated for rice.

The significance of fisheries in sustainable rice cultivation within Ramsar Sites should be further explored and documented and a more efficient combination of “rice-fish” management practices promoted.

Encouragement of the cultivation of native species of fish in association with rice and reducing as much as possible the use of chemicals may enhance the conservation of wetlands.

Issue 3: Management of fisheries

- In some countries, fisheries management based on central governmental control has generally failed to halt the degradation of fisheries resources stocks. A participatory approach is recommended for the inclusion of all stakeholders in the management process.

Participatory management in appropriate sites should be encouraged and facilitated by revising any existing laws and regulations that exclude it, supporting research, and establishing suitable management systems at international, national and basin levels.

- Co-management systems are frequently difficult to establish because of social traditions, land and water use practices, and legislation.

Fisheries legislation and regulations should promote the participation of stakeholders in the formulation of policies for the management of the resource.

- Growing numbers of people using a fishery can mean that the resource is increasingly overfished.

Measures should be adopted to control to the use of fisheries in Ramsar Sites and other wetlands where these are not already in place.

- By-catch of globally-threatened and other wetland-dependent species in fishing gear (such as turtles and waterbirds in gill-nets) continues to threaten the survival of these species.

Measures should be put in place to minimize or prevent by-catch through the use of appropriate fishery techniques.

- Ecologically damaging fishing gear continues to be used in many fisheries.

Where ecologically damaging fishing practices or gear (which may include activities which significantly alter habitat structure, prevent movement of species, or otherwise alter ecological character), are affecting, or are likely to affect, a listed Ramsar wetland, appropriate action should be taken to address the threat of damage to that site caused by such use.

Issue 4: Management of the fisheries resources

- The introduction of alien and/or invasive species in natural fisheries areas poses a growing threat that puts at risk the survival of native species or genomes.

Many inland and coastal fisheries rely on regular stocking programmes: such stocking programmes should preferably use indigenous fish species or genomes.

Contracting Parties are encouraged to adopt effective legal tools and programmes to prevent and minimise the introduction of alien and/ or invasive species within wetlands.

A code similar to the ICES Code of Practice on the Introductions and Transfers of Marine Organisms [available on: <http://www.ices.dk/reports/general/2004/ICESCOP2004.pdf>] and the GEF/UNDP/IMO International Convention for the Control and Management of Ships' Ballast Water and Sediments [available on: http://www.imo.org/Conventions/mainframe.asp?topic_id=867] should be applied rigorously so that Ramsar Sites are not placed at risk through unplanned introductions of aquatic species.

Reasonable practices should be adopted to reduce the risks from unregulated stocking programmes.

Issue 5: Sustainable management of wetland ecosystems for fisheries

- There is a general decline in the environmental health of most inland and coastal ecosystems caused by the impacts of human uses, declines found by the Millennium Ecosystem Assessment (MA) to be already more severe and to be occurring at faster rates in these ecosystems than in others. An area of major concern is the increasing withdrawal of water from inland systems that is affecting the functioning of rivers and the hydrological balance of lakes and coastal waters.

Environmental flow assessments in all rivers and associated wetlands that are threatened by flow-modifying activities such as the construction of dams, levee-ing of river channels, and water abstractions should include specific attention to fisheries resources and fisheries related aspects (see also Resolution VIII.1 and Resolution [X.19] [and Ramsar Wise Use Handbooks 8-11, 4th edition]).

Strategies for the mitigation of negative impacts on the environment from the activities of other users of the aquatic resource should be formulated. Where such impacting uses have ceased, the possibility of rehabilitation of damaged ecosystems should be explored (with reference to COP8 Resolution VIII.16 [and Ramsar Wise Use Handbook 19, 4th edition]).

The establishment of formal conservation and harvest reserves within selected sites of importance to fisheries should be considered.

Issue 6: Conflicts and multi-purpose use

- A number of human uses compete with fisheries for water and aquatic environmental resources, and these risk fisheries sustainability on Ramsar Sites.

Local, national and international mechanisms should be established, as appropriate, whereby allocation of essential resources for the protection of aquatic resources and specifically fisheries resources are negotiated among all users of the resource. Similar mechanisms are needed for the resolution of conflicts between competing uses.

Issue 7: Increasing awareness of the importance of wetland management for fisheries

- There is an urgent need to ensure wider and better understanding of the importance of maintaining both coastal and inland wetlands for the benefit of fisheries maintenance.

Training programmes should be carried out under the Convention's programme on communication, education[, participation] and awareness (CEPA) [Ramsar Wise Use Handbook 6, 4th edition] to promote mutual understanding of the problems of the diverse sectors involved with wetland management and conservation including fisheries.

- Coastal and inland water fishers often operate at a small scale and need support.

Self-motivated initiatives such as community outreach, wildlife monitoring, codes of conduct, certification and education, and awareness-raising should be fostered within fishing communities that are fishing within, adjacent to or in ways which impact upon Ramsar Sites.

Issue 8: Enhancing international cooperation

- Maintenance of fisheries in shared wetlands and seas needs the countries concerned to develop enhanced collaboration.

Countries sharing rivers, coastal lagoons, seas and lakes with significant fisheries should seek to establish common mechanisms for research, information sharing and management of their aquatic resources and specifically fisheries. If possible, such mechanisms should be incorporated into existing institutions, but where no such institutions exist measures should be taken to establish them. [see also Ramsar Wise Use Handbook 20, 4th edition]

Issue 9: Applying existing international agreements

- The application of a number of international agreements and existing guidance can help to ensure that fisheries in or affecting Ramsar Sites and other wetlands are sustainable.

The *Code of Conduct for Responsible Fisheries* (FAO, 1995) [available on: <http://www.fao.org/DOCREP/005/v9878e/v9878e00.htm>] and its various Technical Guidelines should be taken as the guiding principles in regulating marine and freshwater fisheries and aquaculture. Technical guidelines cover: 1. Fishing operations (1996); 2. Precautionary approach to capture fisheries and species introductions (1996); 3. Integration of fisheries into coastal area management (1996); 4. Fisheries management (1997); 5. Aquaculture development (1997); 5. (supplement 1) Aquaculture development: good aquaculture feed manufacturing practice (2001); 6. Inland Fisheries (1997); 7. Indicators for sustainable development of marine capture fisheries. (1999); 8. Responsible fish utilization. (1998); 9. Implementation of the International Plan of Action to prevent, deter and eliminate illegal, unreported and unregulated fishing (2002), and 10. the ecosystem-approach to fisheries.

Management strategies for the conservation of fisheries and aquatic biota especially in relation to Ramsar Sites should take into account any endangered species listed in Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), in accordance with the application of Criterion 2 of the Ramsar *Strategic Framework and guidelines for the future development of the List of Wetlands of International Importance* (Resolution VII.11), as amended by Resolution IX.1 Annex B [see Ramsar Wise Use Handbook 17, 4th edition].

Issue 10: The status of fisheries in Ramsar Sites

- Information on most fisheries pursued in or affecting Ramsar Sites, as supplied in Ramsar Information Sheets, is sparse and generally qualitative. However, the information which does exist confirms that fisheries are practised in many Ramsar Sites or in the larger wetland ecosystems with which Ramsar Sites are associated. It is clear that Ramsar Sites and their associated systems also provide employment to many commercial fishers and subsistence fishers and collectors. Available evidence suggests that inland and small-scale coastal fisheries, including of the types that presently dominate in Ramsar Sites, have declined due to habitat modification, overfishing and other human activities.¹²

12 A key finding of the Millennium Ecosystem Assessment (MA) is that: "The use of two ecosystem services - capture fisheries and freshwater - is now well beyond levels that can be sustained even at current demands, much less future ones. At least one quarter of important commercial fish stocks are overharvested (high certainty). Humans increased the capture of marine fish up until the 1980s by harvesting an ever-growing fraction of the available resource. Marine fish

National and regional programmes for the systematic collection of fisheries data at Ramsar Sites and associated areas should be initiated or reinforced. As a minimum this should include data on weight and size of catch, numbers and effort of fishermen, and social and economic aspects of the fishery.

Issue 11: Coverage of the Ramsar site network for fish

- Since Criteria 7 and 8 for the designation of Ramsar Sites for fish were adopted at the 6th meeting of the Conference of the Contracting Parties (1996), 264 Ramsar Sites have been designated using these Criteria (as of 21 April 2005), although these occur in only 77 of the current 145 Contracting Parties (as of September 2005). It is clear that for fish the Ramsar site network is not yet the coherent and comprehensive national and international network envisaged by the 1999 *Strategic Framework*. Some systems lack representative sites to cover essential habitats for some important fish species.

Additional Ramsar Sites should be designated, especially by those Contracting Parties that have not yet designated Ramsar Sites under Criteria 7 and/or 8, to complete the global network of sites of international importance for their fish populations [see Ramsar Wise Use Handbook 17, 4th edition]

landings are now declining as a result of the overexploitation of this resource. Inland water fisheries, which are particularly important in providing high-quality diets for poor people, have also declined due to habitat modification, overfishing, and water withdrawals." (Millennium Ecosystem Assessment, 2005. *Ecosystems and Human Well-being: Synthesis*. Island Press, Washington, DC).

Relevant Resolutions and Recommendations

Resolution 5.7

(adopted by the 5th meeting of the Conference of the Contracting Parties, Kushiro, Japan, 1993)

Management planning for Ramsar Sites and other wetlands

RECALLING that Contracting Parties to the Ramsar Convention designate wetlands within their territory for the “List of wetlands of international importance”, and formulate and implement their planning so as to promote the conservation of listed sites;

AWARE of the need to take appropriate measures after designation so as to promote the conservation of listed sites, as indicated in Annex II to Montreux Recommendation 4.2, which states that “at each listed wetland, consideration should be given to the need for management” and that “if management measures are deemed appropriate, a management plan should be developed and put into action”;

EMPHASIZING the need for each Ramsar site to have its own management plan;

NOTING that Contracting Parties also establish nature reserves on other wetlands which are not designated for the Ramsar List; CONSCIOUS that, while wetlands vary enormously throughout the world, a methodology for management planning, both for Ramsar Sites and other wetlands can provide guidance for Contracting Parties;

NOTING FURTHERMORE that management planning should aim to achieve a balance between conservation and utilization, and should reinforce the Convention’s “wise use” principle;

WELCOMING the initiatives taken by some Contracting Parties to develop methodologies of general relevance and the efforts already made to test their validity;

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CALLS ON Contracting Parties to develop management plans for each wetland designated for the Ramsar List;

REQUESTS Contracting Parties to send copies of examples of such management plans to the Ramsar Bureau, in particular those that relate to sites on the Montreux Record or which illustrate good practice and successful approaches;

REQUESTS Contracting Parties to establish the appropriate legal and administrative structures for the application of such management plans, and to provide funds for the implementation of the plans and for training of the necessary staff;

FURTHER REQUESTS that, as far as necessary, Contracting Parties apply the “Guidelines on management planning for Ramsar and other wetland sites”, attached as an annex to the present resolution;

CALLS ON Contracting Parties to consider using these guidelines to review and, where necessary, update existing management plans;

REQUESTS the Standing Committee and the Scientific and Technical Review Panel, in collaboration with the Convention Bureau and partner organizations, to follow up practical application of these guidelines at specific sites and to consider the need for refinement of these guidelines in the light of experience; and

URGES that funds be made available, from multilateral or bilateral aid sources, through non-governmental channels or from the Convention's Wetland Conservation Fund for the preparation of management plans and the application of these guidelines at wetlands in developing countries.

Resolution VI.1

(adopted by the 6th meeting of the Conference of the Contracting Parties, Brisbane, Australia, 1996)

Working definitions of ecological character, guidelines for describing and maintaining the ecological character of listed sites, and guidelines for operation of the Montreux Record

1. CONSIDERING that Article 3.2 of the Convention states that each Contracting Party "shall arrange to be informed at the earliest possible time if the ecological character of any wetland in its territory and included in the List [of Wetlands of International Importance] has changed, is changing, or is likely to change as the result of technological developments, pollution or other human interference";
2. RECALLING that Recommendation 4.8 instructed the Bureau to maintain a record of listed sites where change in ecological character had occurred, was occurring, or was likely to occur, and that Resolution 5.4 established guidelines for operating the record, to be known as the Montreux Record;
3. FURTHER RECALLING that Recommendation 5.2 emphasized the need for further studies of the concepts of "ecological character" and "change in ecological character", and instructed the Bureau, with the support of the Scientific and Technical Review Panel (STRP) and partner organizations, to report to the present meeting on the results of such studies;
4. NOTING the results of the work carried out by the STRP and during Technical Session B of the present meeting;
5. RECOGNIZING the need for definitions and guidelines to assist Contracting Parties with implementation of Article 3.2 and, in particular, with maintaining the ecological character of listed sites;
6. FURTHER RECOGNIZING the need for revised guidelines to ensure effective operation of the Montreux Record;
7. NOTING that Resolution VI.13 of the present meeting seeks to address the deficiencies in essential baseline data provided by Contracting Parties in the form of Information Sheets on Ramsar Wetlands; and
8. AWARE of the existence of many successful environmental monitoring programmes world-wide (including those which rely on the involvement and enthusiasm of local communities) and of the value of Early Warning Systems to allow Contracting Parties to take sufficiently prompt actions to prevent changes in the ecological character of listed sites;

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9. ACCEPTS working definitions, to be assessed further during the 1997-1999 triennium, of "ecological character" and "change in ecological character", together with the guidelines for describing and maintaining ecological character of listed sites, as contained in the Annex to the present resolution, recognizing that these working definitions are relevant to the management of wetlands in general;

10. REQUESTS the Contracting Parties and the Bureau, with the advice of the STRP, to implement the revised procedure for operation of the Montreux Record, as contained in the Annex to the present resolution;
 11. CALLS ON Contracting Parties to support the development, by the relevant authorities within their territories, of Early Warning Systems for detecting, and initiating action in response to, change in ecological character; and
 12. INSTRUCTS the STRP, in cooperation with the Bureau and partner organizations, and the wider scientific community, to liaise with the Standing Committee, in order to identify the effects of application of the present resolution, especially at specific sites, and to report accordingly to the 7th Meeting of the Conference of the Parties.
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Resolution VII.10

(adopted by the 7th meeting of the Conference of the Contracting Parties, San José, Costa Rica, 1999)

Wetland Risk Assessment Framework

1. RECALLING Article 3.2 of the Convention which states that Contracting Parties “shall arrange to be informed at the earliest possible time if the ecological character of any wetland in its territory and included in the List [of Wetlands of International Importance] has changed, is changing, or is likely to change as the result of technological developments, pollution or other human interference”;
2. FURTHER RECALLING that in response to Article 3.2 of the Convention, the Conference of the Contracting Parties has established the Record of sites included in the Ramsar List where change in ecological character had occurred, was occurring, or was likely to occur (the Montreux Record: Recommendation 4.8) and guidelines for its operation (Resolution 5.4);
3. ALSO AWARE that in response to Recommendation 5.2, the Scientific and Technical Review Panel (STRP) prepared working definitions of ecological character, change in ecological character, and guidelines for describing and maintaining ecological character that were adopted through Resolution VI.1;
4. NOTING that paragraph 9 of Resolution VI.1 called for assessment in the 1997-99 triennium of the working definitions of ecological character and change in ecological character, as well as the guidelines for describing and maintaining ecological character;
5. ALSO NOTING that paragraph 11 of Resolution VI.1 called for the development of early warning systems for detecting, and initiating action in response to, change in ecological character;
6. FURTHER NOTING that in order to formulate advice on the above two matters, an expert workshop was held in April 1998, which reported its findings to the 7th meeting of the STRP which followed immediately thereafter;
7. CONSCIOUS that in the 1997-99 triennium the STRP, as part of its Work Plan, has undertaken a review of the application of the Guidelines on management planning for Ramsar Sites and other wetlands, adopted by Resolution 5.7, and that this has shown little inclusion of monitoring schemes or reliance on early warning indicators for detecting change in ecological character;

8. ACKNOWLEDGING that Technical Session IV of this Conference on “Tools for assessing and recognizing wetland values” had presented to it and considered in detail the annex to this resolution entitled Wetland Risk Assessment Framework; and
9. EXPRESSING ITS APPRECIATION to the authors of the annex to this Resolution for providing their combined advice and guidance, based on their experience, so that Contracting Parties are equipped with specific guidelines to assist them with meeting their obligations under Article 3.2 of the Convention;

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10. ADOPTS as guidance for the Contracting Parties the annex to this Resolution entitled Wetland Risk Assessment Framework;
11. FURTHER ADOPTS the following definitions for ecological character and change in ecological character as recommended by the STRP following their assessment of the working definitions for the same adopted by Resolution VI.1:

Ecological character is the sum of the biological, physical, and chemical components of the wetland ecosystem, and their interactions, which maintain the wetland and its products, functions, and attributes.

Change in ecological character is the impairment or imbalance in any biological, physical, or chemical components of the wetland ecosystem, or in their interactions, which maintain the wetland and its products, functions and attributes.

12. URGES Contracting Parties to note and apply the attached guidance, which provides a basis for assessing the major causes of change in ecological character – changes to the water regime; water quality; physical modification; exploitation of biological products; and introduction of exotic species;
13. CALLS UPON Contracting Parties to ensure that their preparation of management plans for sites included in the Ramsar List and other wetlands includes, as an integrated element, early warning indicators as part of a monitoring programme based on the framework adopted by Resolution VI.1; and
14. ENCOURAGES the STRP to compile, with information submitted by Contracting Parties and from other relevant sources, a report outlining cases where early warning systems for wetlands are in place or are being established, and of the experience gained in maintaining these systems.

Resolution VIII.14

(adopted by the 8th meeting of the Conference of the Contracting Parties, Valencia, Spain, 2002)

New Guidelines for management planning for Ramsar Sites and other wetlands

1. TAKING INTO ACCOUNT Article 3.1 of the Convention, which specifies that “Contracting Parties shall formulate and implement their planning so as to promote the conservation of the wetlands included in the List [of wetlands of international importance]”;
2. ALSO TAKING INTO ACCOUNT Article 3.2, which provides that “each Contracting Party shall arrange to be informed at the earliest possible time if the ecological character of any wetland in its territory and included in the List has changed, is changing or is likely to

change” and that “information on such changes shall be passed without delay” to the Ramsar Bureau;

3. RECALLING Resolution 5.7, which adopted *Guidelines on management planning for Ramsar Sites and other wetlands*; Recommendation 6.13, which called upon the Scientific and Technical Review Panel (STRP) to review the most recent advances in this area; and Resolution VII.12, which reaffirmed the continuing value of these Guidelines;
4. FURTHER RECALLING that in Resolution VII.12 the Contracting Parties instructed the STRP, with support from the Ramsar Bureau, to prepare for consideration at COP8 further guidance with respect to management planning, which reviews the latest approaches to environmental, social and economic impact assessment and cost-benefit analysis, zonation and multiple use, design and maintenance of buffer zones, and the application of the precautionary approach;
5. HAVING BEEN INFORMED that in preparing the further guidance called for in Resolution VII.12, the STRP determined that, to ensure that the overall management planning guidance available to Contracting Parties would reflect recent advances in this area and yet remain coherent and easy to follow, a full revision of the Guidelines as adopted by Resolution 5.7 would be necessary;
6. NOTING that in Resolution VII.12, the Contracting Parties also urged that, by COP8 in 2002, management plans should be in preparation, or in place, for at least three quarters of the Ramsar Sites in each Contracting Party and that these plans, once in place, should be implemented in full; and FURTHER NOTING the indications provided in the National Reports for this meeting of the Conference of the Parties that this is the case for at least 397 Ramsar Sites, or 35 per cent of those included in the Ramsar List;
7. RECOGNIZING that the establishment and implementation of a management plan for a Ramsar site or other wetland is part of an integrated management planning process which helps to decide upon the objectives of site management; identify and describe the management actions required to achieve the objectives; determine the factors that affect, or may affect, the various site features; define monitoring requirements for detecting changes in ecological character and for measuring the effectiveness of management; demonstrate that management is effective and efficient; maintain continuity of effective management; resolve any conflicts of interest; obtain resources for management implementation; enable communication within and between sites, organizations and stakeholders; and ensure compliance with local, national and international policies; and
8. AWARE that the Joint Programme of Work 2002-2003 between the Ramsar Bureau and UNESCO's Man and the Biosphere Programme (MAB) includes actions to review, and as far as possible to harmonize, management planning guidance, including inventory, assessment, monitoring and zonation for Ramsar Sites and Biosphere Reserves;

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9. ADOPTS the *New Guidelines for management planning for Ramsar Sites and other wetlands*, as annexed to this Resolution;
10. STRONGLY URGES Contracting Parties to apply the New Guidelines to establish and implement management planning processes, particularly for those Ramsar Sites within their territory that do not yet have such processes and plans in place;
11. RECOGNIZES that other management planning processes exist, especially where other designations apply to the same areas that are listed as Ramsar Sites, and that these may be valid alternatives for delivering management planning where such approaches adequately

- and fully implement clearly stated conservation objectives to ensure the conservation and wise use of these wetlands;
12. REQUESTS the Ramsar Bureau to develop a field guide for the practical application of the guidelines, recognizing that there may be circumstances that limit the application of the guidelines in full;
 13. NOTES that these guidelines recommend that the management and planning processes include regular review and revision of the management plan, and URGES Contracting Parties to apply the New Guidelines when reviewing and updating existing management plans for Ramsar Sites and other wetlands;
 14. ENCOURAGES Contracting Parties to utilize all the available Ramsar tools and guidance to assist in their management planning processes, including *inter alia* the description and maintenance of ecological character and designing a monitoring programme (Resolution VI.1), the wetland risk assessment and indicators (Resolution VII.10), the guidance on impact assessment (Resolution VIII.9) and on wetland restoration, including identification of sites appropriate for restoration (Resolution VIII.16), and the *Guidelines for Global Action on Peatlands* (Resolution VIII.17);
 15. REQUESTS the Ramsar Bureau to transmit the *New Guidelines for management planning for Ramsar Sites and other wetlands* to the Convention on Biological Diversity (CBD), the World Heritage Convention, the Convention on Migratory Species (CMS) and the African-Eurasian Migratory Waterbird Agreement (AEWA), Eurosite, and other agreements and organizations concerned with the management of wetland ecosystems, particularly with regard to management planning processes for sites of common interest;
 16. REQUESTS the Scientific and Technical Review Panel (STRP), assisted by the Ramsar Bureau and in cooperation with the MAB Programme, the CBD, and other relevant organizations, to review and prepare further guidance on zonation and monitoring programmes and methodologies for Ramsar Sites and other wetlands, including indicators and rapid assessment methodologies and the use of remote sensing;
 17. RECOMMENDS that Contracting Parties, when planning the management of Ramsar Sites and other wetlands, should take into account the wider management implications of activities within river basins and other catchments, applying Resolution VII.18 on *Guidelines for integrating wetland conservation and wise use into river basin management* (Ramsar Handbook no. 4), as well as the guidance adopted by this meeting on integrated coastal zone management (Resolution VIII.4) and on the allocation and management of water for maintaining the ecological functions of wetlands (Resolution VIII.1);
 18. URGES Contracting Parties to take note of the emphasis in the *New Guidelines for management planning for Ramsar Sites and other wetlands* on ensuring the full involvement of all stakeholders in all stages of the management planning process, and to utilize the guidelines adopted by Resolution VII.8 on *Establishing and strengthening local communities' and indigenous peoples' participation in the management of wetlands* (Ramsar Handbook no. 5) and the guiding principles on cultural aspects of wetlands annexed to Resolution VIII.19 to assist in this process;
 19. NOTES that the *New Guidelines for management planning for Ramsar Sites and other wetlands* will, *inter alia*, form the basis of the criteria for the acceptance of sites onto the "San José Record" for the promotion of wetland management adopted by this meeting of the Conference of the Parties (Resolution VIII.15); and
 20. STRONGLY URGES Contracting Parties to utilize the management planning process and the *New Guidelines for management planning for Ramsar Sites and other wetlands* to establish for each
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site on the Ramsar List a monitoring programme, including indicators of ecological character features, and to put into place national mechanisms so as to be informed when the ecological character of a site has changed, is changing, or is likely to change, and FURTHER URGES Contracting Parties to report such matters, without delay, to the Ramsar Bureau in accordance with Article 3.2 of the Convention.

Resolution VIII.18

(adopted by the 8th meeting of the Conference of the Contracting Parties, Valencia, Spain, 2002)

Invasive species and wetlands

1. AWARE that alien species that become invasive continue to pose a major threat to the ecological character of wetlands worldwide, and to wetland species, and that such invasions can cause major social and economic damage and loss;
2. ALSO AWARE that it is predicted that the effects of global climate change will include invasion by alien species into new areas, and that species formerly regarded as benign may become invasive;
3. RECALLING Resolution 5.6 on *Additional guidance for the implementation of the wise use concept*, which includes reference to taking measures to address problems of invasive species, and Resolution VII.14 in which the Contracting Parties urged that steps be taken to identify, eradicate and control invasive species in their jurisdictions; to review and as necessary adopt legislation and programmes to prevent the introduction and movement or trade of new and environmentally dangerous alien species into or within their jurisdictions; to develop capacity to facilitate identification and awareness of alien and invasive species; and to share information and experience, including on best practice management;
4. CONCERNED that little information has been supplied by Contracting Parties in the Ramsar Information Sheets (RIS) prepared for the designation of Wetlands of International Importance concerning the presence, threats and management measures for invasive alien species on Ramsar Sites and that in many cases this information is out of date, and RECALLING that Contracting Parties have resolved to provide an updated RIS for each designated Ramsar site at no longer than six-year intervals (Resolution VI.13);
5. NOTING that guidance adopted by this meeting of the Conference of the Parties, including *New Guidelines for management planning for Ramsar Sites and other wetlands* (Resolution VIII.14) and the Resolution on the guidelines adopted by the Convention on Biological Diversity (CBD) for incorporating biodiversity-related issues into environmental impact assessment legislation and/or processes and in strategic environmental assessment and their relevance to Ramsar (Resolution VIII.9), is relevant to the recognition, prevention, eradication and control of invasive alien species;
6. RECALLING that in Resolution VII.14 the Parties also directed the Scientific and Technical Review Panel (STRP) to prepare wetland-specific guidelines for identifying, establishing priorities for action, and managing alien species which potentially pose a threat to wetlands and wetland species, in cooperation with the Subsidiary Body for Scientific, Technical and Technological Advice (SBSTTA) of CBD, the Global Invasive Species Programme (GISP), and other programmes established under international conventions;

7. AWARE that the STRP has contributed its input to CBD's SBSTTA at its 6th meeting (March 2001) when guidance based on Article 8 (h) of the CBD and Decision V/8 of CBD COP5 on invasive species was extensively reviewed;
8. ALSO AWARE that the CBD-Ramsar 3rd Joint Work Plan 2002-2006 includes collaborative actions with the GISP, IUCN–The World Conservation Union and the World Conservation Monitoring Centre (UNEP-WCMC), to increase the availability of information and guidance on aquatic invasive species and the development of further work, including assessment of inland waters invasive alien species;
9. RECOGNISING that CBD, GISP and IUCN have prepared strategies, reviews of legislation, and toolkits, including case studies for addressing different aspects of invasive alien species, and that these also provide valuable guidance and assistance to Contracting Parties addressing wetland invasive species issues;
10. NOTING that the GISP is developing a further programme of work which will include a focus on assessment, assistance and tools for application at national and regional scales, and provision of further information focusing on aquatic invasive species, in collaboration with the Ramsar Bureau, CBD, IUCN, and other relevant organizations; and
11. WELCOMING the work of the Ramsar Bureau, in collaboration with IUCN, the World Heritage Centre, and others, for the initiation of a communications and awareness-raising project on African wetland invasive species which will disseminate information and advice on good practice and experience to wetland managers;

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12. URGES Contracting Parties to address the problems posed by invasive species in wetland ecosystems in a decisive and holistic manner, making use, as appropriate, of the tools and guidance developed by various institutions and processes, including any relevant guidelines or guiding principles adopted under other conventions;
13. ENCOURAGES Contracting Parties to participate in and contribute fully to the further development of appropriate tools and guidance for addressing these problems;
14. INSTRUMENTS the Ramsar Bureau to continue cooperating as closely as possible with the institutions and processes that are dealing with invasive species issues, particularly those of direct relevance to wetland ecosystems;
15. URGES Contracting Parties to undertake risk assessments of alien species which may pose a threat to the ecological character of wetlands, taking into account the potential changes to ecosystems from the effects of global climate change, and applying the guidance available in Ramsar's *Risk Assessment Framework* (Resolution VII.10);
16. FURTHER URGES Contracting Parties to identify the presence of invasive alien species in Ramsar Sites and other wetlands in their territory, the threats they pose to the ecological character of these wetlands, including the risk of invasions by such species not yet present within each site, the actions underway or planned for their prevention, eradication or control, and, for Ramsar Sites, to report on this to the Ramsar Bureau without delay in line with Article 3.2 of the Convention, so that this information may be included in the Ramsar Sites Database;
17. REQUESTS the Ramsar Bureau to make information provided by Contracting Parties available to the Convention on Biological Diversity and others in support of the implementation of the CBD-Ramsar Joint Work Plan 2002-2006;

18. RECOGNISES that many aquatic invasive species, both inland and coastal and marine species, can spread rapidly and repeatedly throughout entire wetland ecosystems, river basins and coastal and marine zones, such that eradication in one place may not prove effective at preventing further invasions, and URGES all Contracting Parties with shared wetlands, river systems, and coastal/marine zones to cooperate fully in the prevention, early warning in transboundary wetlands, eradication and control of invasive species, applying the *Guidelines for international cooperation under the Ramsar Convention* (Ramsar Handbook 9);
 19. URGES Contracting Parties, in their development and implementation of national strategies and responses to invasive alien species, to recognise that terrestrial invasions by alien species can threaten and affect the ecological character of wetlands including through the lowering of water tables and alteration of water flow patterns, and to ensure that appropriate measures to prevent or control such invasions are in place;
 20. URGES Contracting Parties, prior to moving water between river basins, to examine carefully the potential environmental impacts due to invasive species;
 21. FURTHER URGES all Contracting Parties to work closely with their counterpart national focal points for the Convention on Biological Diversity, the UN Convention to Combat Desertification, the UNESCO Man and the Biosphere Programme (MAB), the International Maritime Organization (IMO), and others in the development and implementation of national policies, strategies and management responses to threats from invasive alien species, and to ensure that prevention, eradication and control of such species are fully incorporated in national legislation and national wetland and biodiversity policies, strategies and action plans, applying the *Ramsar Guidelines for reviewing laws and institutions to promote the conservation and wise use of wetlands* (Ramsar Handbook 3) and *Guidelines for developing and implementing National Wetland Policies* (Ramsar Handbook 2);
 22. REQUESTS the Ramsar Bureau to explore with the secretariat of the CBD and the GISP ways and means for the Ramsar Convention to contribute to the review, for the CBD, on the assessment of the impact of invasive species on inland waters, including on islands, and to make available the results of this review to Contracting Parties and wetland managers;
 23. ENCOURAGES the Ramsar Bureau, in collaboration with IUCN, the World Heritage Centre, and UNESCO's MAB, to further develop and implement communication and awareness-raising work on African wetland invasive species for wetland managers, to disseminate widely its information and awareness products, and to consider developing similar projects in other Ramsar regions; and ENCOURAGES Contracting Parties and donor organizations to consider providing resources for such projects; and
 24. ALSO ENCOURAGES the GISP, IUCN, and others to further develop Web-based sources of information on identification, distribution and management of invasive species and potential invasive species affecting wetlands, and to make these widely available to Contracting Parties and wetland managers so as to assist them in the early detection, eradication and control of invasive species.
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Resolution VIII.19

(adopted by the 8th meeting of the Conference of the Contracting Parties, Valencia, Spain, 2002)

Guiding principles for taking into account the cultural values of wetlands for the effective management of sites

1. ACKNOWLEDGING that the ancient and intimate links of traditional societies to wetlands and water have given rise to important cultural values relevant to wetland conservation and wise use, which have been recognized in the diverse cosmologies of different civilizations and cultures throughout history;
2. FURTHER ACKNOWLEDGING that the specific physical features of wetlands have contributed to particular ways of managing traditional activities through structures, procedures, techniques and specially designed artefacts which are of great cultural significance;
3. RECOGNIZING that peoples' relations with wetlands have given rise to aspects of non-material culture, through folklore, music, mythology, oral traditions, customs, traditional knowledge and popular wisdom, and that their reflection can be found in social practices and the traditional forms of social organization for managing wetland resources, and especially water;
4. FURTHER RECOGNIZING that sustainable traditional uses of wetland resources have frequently created cultural landscapes of significant value to wetland conservation and wise use;
5. AWARE that the cultural values of wetlands have been and still are of great importance to societies living in wetlands and their surroundings, and constitute part of their identity; thus their loss may not only contribute to their alienation from wetlands, but also cause significant negative social and ecological impacts;
6. RECOGNIZING that cultural knowledge of wetlands constitutes a collective legacy for today's societies;
7. AWARE that most of the knowledge about practices, and practices themselves, of traditional wetland management in the diverse cultures have contributed to wetland conservation and wise use over millennia, and continue to contribute to it;
8. FURTHER AWARE that in addition to their spiritual dimension of this knowledge and other aspects of past wetland management, such values can be of considerable socio-economic importance, since they can be used as a resource for sustainable tourism and recreational activities and, through them, contribute to an increase of income and quality of life for the inhabitants;
9. CONSCIOUS of the fact that the adequate recognition of and support for cultural heritage, both material and non-material, is an indispensable component in any process for the sustainable use of wetland resources;
10. RECOGNIZING that there are important weaknesses and gaps in the procedures and methods for identifying, valuing and protecting the cultural heritage of wetlands, as well as in defining and implementing policies related to them;
11. NOTING that the profound and rapid social and economic transformations that have taken place during recent decades have increasingly threatened the adequate preservation of the cultural heritage that is typical of wetlands in many parts of the world;

12. RECOGNIZING that there are various multilateral agreements and organizations that work to recognize and protect cultural values and relationships with ecosystems including wetlands;
13. ACKNOWLEDGING that the Ramsar Convention needs to work in cooperation with multilateral and regional agreements and other bodies addressing the need for resolute action to preserve the cultural heritage, including among others:
 - the Convention Concerning the Protection of the World Cultural and Natural Heritage (Paris, 1972);
 - the Call of Granada (1975) of the Council of Europe on Rural architecture and its landscape;
 - Recommendation 881 (1979) of the Parliamentary Assembly of the Council of Europe on Rural architecture heritage;
 - UNESCO's activities in the promotion of the conservation of cultural heritage;
 - the general principles for conservation proposed by the Vernacular Built Heritage Charter (Jerusalem, 1996), ratified by the XI General Assembly of the International Council of Monuments and Historical Sites (ICOMOS);
 - the various recommendations of the World Intellectual Property Organization (WIPO) for the protection, conservation, legal status, economic exploitation, and international protection of folklore;
 - the Convention on Biological Diversity, in particular concerning its Decision VI/10 of the Conference of the Contracting Parties on the *Outline of the composite report on the status and trends regarding the knowledge, innovations and practices of indigenous and local communities relevant to the conservation and sustainable use of biodiversity*, and the plan and timetable for its preparation; and on *Recommendations for the conduct of cultural, environmental and social impact assessment regarding developments proposed to take place on, or which are likely to impact on, sacred sites and on lands and waters traditionally occupied or used by indigenous and local communities*;
 - the European Landscape Convention (Florence, 2000);
 - the Convention concerning Indigenous and Tribal Peoples in Independent Countries (International Labour Organisation No. 169, 5 September 1991); and
 - the Permanent Forum of Indigenous People.
14. RECALLING that *inter alia* the text of the Ramsar Convention already recognizes, in the third paragraph of its preamble, "that wetlands constitute a resource of great economic, cultural, scientific, and recreational value, the loss of which would be irreparable" and FURTHER RECALLING that COP7 adopted *Guidelines for establishing and strengthening local communities' and indigenous peoples' participation in the management of wetlands* (Resolution VII.8); and
15. NOTING the background documentation and examples on the cultural aspects of wetlands from around the world presented during Technical Session 5 of this meeting of the Conference of the Parties;

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16. TAKES NOTE WITH INTEREST of the list of *Guiding Principles* included in the Annex to this Resolution;
17. REQUESTS that the Ramsar Bureau seek inputs from Contracting Parties, experts and practitioners, and local communities and indigenous peoples from around the world to enhance the information paper on cultural aspects of wetlands (COP8 DOC. 15) and the detailed guidance prepared for consideration by this meeting of the Conference of the Parties, with a view to publishing it as a background document, and to inform COP9 of the progress made;

18. ENCOURAGES Contracting Parties to consider using the list of *Guiding principles* included in the Annex to this Resolution, but only in relation the conservation and enhancement of the cultural values of wetlands;
 19. FURTHER ENCOURAGES Contracting Parties, within their national and legal frameworks and available resources and capacity:
 - a) to consider the compilation and assessment of both material and non-material cultural elements related to wetlands and water, in particular when preparing the Ramsar Information Sheet (RIS) for the designation of new Wetlands of International Importance or when updating the RIS of existing Ramsar Sites, taking into account, as appropriate, intellectual property rights, customary law, and the principle of prior informed consent, in accordance with CBD and WIPO rules;
 - b) to promote the appreciation and revitalization, of these cultural values among populations close to wetlands, and in general among the wider public;
 - c) to include relevant aspects of cultural heritage in both the design and implementation of wetland management plans;
 - d) to make efforts to integrate cultural and social impact criteria into environmental assessments, which could include, *inter alia*, issues of particular cultural concern, such as beliefs and religions, customary practices, forms of social organization, systems of natural resources use, including patterns of land use, places of cultural significance, sacred sites and ritual ceremonies, languages, customary lore/law systems, political structures, roles and customs;
 - e) to carry out such efforts with the active participation of indigenous peoples, local communities and other stakeholders, and to consider using the cultural values of wetlands as a tool to strengthen this involvement, particularly in wetland planning and management;
 20. ENCOURAGES Contracting Parties to recognize cultural and heritage values relating to wetlands in their existing heritage protection, legal framework and policies;
 21. INVITES Contracting Parties to consider conducting appropriate joint educational and training activities with regard to the cultural values of wetlands, as well as to consider developing pilot projects for testing on a local, regional and national scale with a view to further improving the application and/or integration of the *Guiding Principles* in wetland conservation and wise use;
 22. ENCOURAGES Contracting Parties to establish appropriate consultation mechanisms at regional or national levels, in order to consider how the *Guiding Principles* might be applied in developing and promoting the cultural values of wetlands; and
 23. URGES Contracting Parties and the Ramsar Bureau to develop synergies and to avoid duplication of efforts with the relevant multilateral agreements, such as those mentioned in paragraph 13 above.
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Resolution IX.4

(adopted by the 9th meeting of the Conference of the Contracting Parties, Kampala, Uganda, 2005)

The Ramsar Convention and conservation, production and sustainable use of fisheries resources¹³

1. RECOGNIZING the important role that inland, coastal and near-shore marine wetlands play in supporting aquatic species populations and fisheries resources;
2. CONSCIOUS that fishing is of great social, cultural and economic importance throughout the world;
3. RECOGNIZING that fisheries resources are a vital source of food and income for millions of people, which can assist in the further reduction of poverty, and CONCERNED that the Millennium Ecosystem Assessment (MA) has reported that fisheries yields in many parts of the world are declining due to unsustainable harvest, habitat degradation, and loss of fisheries resources spawning and nursery grounds, as well as feeding and refuge areas and NOTING that the different fisheries techniques and related activities within or adjacent to wetlands (from catch to consumption) may impact on other biota;
4. CONCERNED by the loss of fisheries resources and the increasing number of aquatic species recognized in the IUCN Red List as globally threatened, and AWARE of the important role that some Ramsar Sites play in the conservation of endangered aquatic biota;
5. AWARE of the lack of sound scientific data on fisheries resources in many wetlands;
6. RECALLING the relevance of the guidance adopted by the Convention on integrating wetland conservation and wise use into river basin management (Resolution VII.18) and coastal zone management (Resolution VIII.4) to securing the integrated management of wetland ecosystems upon which fisheries resources depend;
7. ALSO RECALLING that in Resolution VIII.2 the Conference of the Parties encouraged “Contracting Parties, wherever possible and appropriate, to take the necessary steps in order to maintain the migration access for indigenous [native] fish and other species past dams”;
8. COMMENDING those Parties that have taken actions to conserve or restore native aquatic species populations and their habitats, such as through habitat restoration, the provision of fish passages past in-stream infrastructure, the control of invasive alien species competitors, the control of unsustainable aquaculture practices and/or the reduction of water pollution impacts;
9. NOTING the comparative ecosystem benefits gained from supplying protein from sustainable fisheries, thereby alleviating agricultural pressure on land and in reducing water pollution;
10. ALSO NOTING the widespread growth in aquaculture, its potential benefits for increasing fish resources and reducing environmental costs, and the need for careful planning and management to avoid negative impacts upon native aquatic species and wetland ecosystems;
11. AWARE of the adoption by the UN Food and Agriculture Organisation (FAO) of the *Code of conduct for responsible fisheries* (1995) and its subsequent associated range of Technical Guidelines, and of the recognition that these give to the need to promote sustainable use of fisheries resources and to mitigate negative impacts of aquaculture practices;

13 “fisheries resources”: fish, crustaceans, mollusks and algae.

12. ALSO AWARE of the ongoing work of the Comprehensive Assessment of Water Management in Agriculture (CA) led by the International Water Management Institute (IWMI) and its relevance to issues of wetlands, capture fisheries and aquaculture;
13. RECALLING that Action 1.2.6 of the Ramsar Strategic Plan 2003-2008 calls for an assessment of “the contribution of Ramsar Sites and other wetlands to the maintenance of fisheries, including utilizing information available from the Millennium Ecosystem Assessment (MA) and other assessment programmes, and [recommendation of] sustainable management practices which can contribute to the WSSD target of, where possible by 2015, maintaining or restoring depleted fish [fisheries resources] stocks to levels that can produce the maximum sustainable yield” and ALSO RECALLING the Programmes of work of the Convention on Biological Diversity on inland waters and coastal and marine biodiversity;
14. RECOGNIZING that coral reefs are amongst the most complex, species-rich and productive of marine ecosystems, covering less than 1% of the ocean’s area yet home to one-third of all marine fish species, that coral reef fisheries are estimated to yield 6 million metric tons of fish catch annually, with one-quarter of the total worldwide fish production being in developing countries with coral reefs, and that they provide a habitat for a significant proportion of marine biodiversity;
15. RECOGNIZING that several environmental benefits/services are provided by mangrove ecosystems including coastal protection, nutrients and sediments retention and carbon dioxide sink, their special relevance as nurseries of various aquatic species, and their protective role to the existing associated ecosystems such as coral reefs and sea grass beds, and HIGHLIGHTING the importance of mangrove ecosystems, including their associated tidal flats, and estuaries as a source of fisheries resources to several coastal communities;
16. AWARE that, according to the FAO World Mangrove Atlas, mangrove areas are being destroyed at a rate of 1% a year, despite their relevance to fisheries production;
17. ALSO AWARE that sea grass beds are vital as spawning grounds, habitat and refuge for many marine species at different stages in their life cycle;
18. RECALLING Resolution VIII.10 which recognized these ecosystems as being under-represented on the Ramsar List;
19. AWARE of the WSSD Plan of Implementation actions concerning the establishment of marine protected areas, the CBD COP7 Decision VII/5 on marine and coastal biological diversity, the CBD Programme of work on protected areas (Decision VII.28), and the recent work of the FAO Committee on Fisheries (CoFi) on the role of marine protected areas (MPAs) in fisheries management; and NOTING the urgent need to address the under-representation of protected areas in marine and coastal habitats and in inland waters through National Plans for Protected Areas;
20. NOTING with satisfaction the financial support provided by IUCN, WWF and the World Fish Centre in the implementation of Action 1.2.6 of the Ramsar Strategic Plan 2003-2008 and their role as advocates and technical advisors in relation to aquatic resources and sustainable fisheries, and FURTHER NOTING their collaboration with the Scientific and Technical Review Panel through the preparation of a ‘Review of Ramsar Sites and Fisheries Maintenance’, to be published as a *Ramsar Technical Report*, and the outline of issues and recommendations concerning wetlands and the conservation and sustainable use of fisheries resources annexed to this Resolution; and

21. ALSO NOTING that Wetlands International and IUCN-The World Conservation Union have established a Freshwater Fish Specialist Group that will provide advice on priority actions for freshwater fish conservation to Contracting Parties, river basin organizations and others;

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22. CONFIRMS that this Resolution covers issues in inland, coastal and marine fisheries in wetlands within the scope of Article 1 and Ramsar Sites within the scope of Article 2.1 of the Ramsar Convention;
23. URGES Contracting Parties to apply as appropriate the recommendations annexed to this Resolution when addressing issues of the sustainable use of fisheries resources in relation to the conservation and wise use of Ramsar Sites and other wetlands;
24. URGES Contracting Parties to review their policy frameworks and institutional arrangements, in line with Resolutions VII.6 on National Wetland Policies and VII.7 on reviewing laws and legislation, so as to ensure that fisheries management authorities and those involved with conserving and/or managing aquatic biodiversity are aware of, complement and support national, subnational and local efforts to implement the Convention;
25. REQUESTS fisheries authorities responsible for managing fisheries within, adjacent to, or associated with Ramsar Sites to ensure that their activities support the maintenance of the ecological character of the Ramsar site (or sites);
26. URGES Contracting Parties and INVITES relevant organizations to use the habitat and species conservation provisions of the Convention to support the introduction and/or continuance of management measures that mitigate the environmental impacts of fishing, including the use of spatial management approaches as appropriate, and ALSO URGES the Ramsar Secretariat to work with other conventions, instruments and organizations concerned with the conservation of biodiversity and the management of natural resources (including FAO at an international and regional level), in order to promote the synergy and alignment of planning and management approaches that benefit the conservation and sustainable management of fisheries resources and recognition of the contribution this makes towards meeting CBD targets, WSSD goals, and Millennium Development Goals (MDGs);
27. ENCOURAGES Contracting Parties to liaise with relevant partners to undertake inventories, assessments and monitoring of fisheries resources which depend on wetlands;
28. REQUESTS those responsible for the management of Ramsar Sites to incorporate into their management planning processes, in line with Resolution VIII.14 on management planning, measures to maintain the ecological benefits/services of wetlands including sustainable fisheries;
29. REQUESTS Contracting Parties to review and, where necessary, enhance national and regional programmes for the systematic collection of ecological and socio-economic data on fisheries, including artisanal fisheries, and data on aquaculture of relevance to Ramsar Sites and associated areas;
30. URGES Contracting Parties to take the necessary steps within their frameworks for integrated river basin and coastal zone management to maintain or reinstate aquatic biota migration pathways, to reduce the impacts of point source and diffuse pollution in all its forms, to establish and implement environmental flow allocations supporting the conservation of aquatic biota, to protect critical spawning and nursery grounds, and to restore relevant habitats where these have become degraded, taking into account the guidance adopted in

Resolutions VIII.1 on water allocation, VIII.4 on Integrated Coastal Zone Management, and VIII.32 on mangrove ecosystems;

31. URGES Contracting Parties carefully to control aquaculture (e.g. pond and cage culture) practices in Ramsar Sites and in areas that are liable to impact on Ramsar Sites and other wetlands so as to prevent adverse changes to the ecological character of wetlands, applying the provisions of the 1997 FAO Code of Conduct and its associated Technical Guidelines for Responsible Fisheries – Aquaculture Development and the 2000 Bangkok Declaration and Strategy for Aquaculture Development (Network of Aquaculture Centres in Asia-Pacific (NACA)/FAO));
32. STRONGLY URGES each Contracting Party to enforce existing policies and legislation to suspend any promotion, creation of new facilities, or expansion of unsustainable aquaculture activities harmful to wetlands, in line with Resolution VII.21 on intertidal wetlands;
33. ALSO STRONGLY URGES Contracting Parties with mangrove ecosystems in their territories, taking into account the provisions of Resolution VIII.32, to review and, as appropriate, to modify any of their national policies and strategies that have or could have harmful effects on these ecosystems, and to implement measures to protect and restore the benefits of these ecosystems for human populations, recognizing their rights, uses and traditional customs and the maintenance of biodiversity, and to cooperate at the international level to agree regional and global strategies for the maintenance of these ecosystems;
34. FURTHER STRONGLY URGES each Contracting Party, in order to maintain the ecological character of wetlands, to review its policies, laws and programmes for regulating the introduction of aquatic biota for aquaculture and the aquarium industry, to control the accidental movement of species for example through ballast water, to avoid introduction of invasive and/or alien species, and to undertake the necessary measures to prevent the introduction or spread of known alien and/or invasive aquatic biota (including invasive alien genes), in line with Resolution VIII.18;
35. URGES each Contracting Party with coral reef, sea grass beds and other associated ecosystems in their territories to implement national programs for the protection of these ecosystems through the establishment of effective protected areas, monitoring programs, awareness programmes and cooperation for innovative coral reef, sea grass beds and associated ecosystem restoration projects;
36. ALSO URGES each Contracting Party to take necessary steps within their policies and national systems of protected areas for establishment and recognition of inland, coastal and marine protected areas as a tool for biodiversity conservation and fisheries resources management;
37. REQUESTS each Contracting Party to take into account the provisions of Resolution VII.36. which highlights the importance of participatory management to be considered in policies, actions and programs for the conservation and sustainable use of fisheries resources;
38. REQUESTS the Ramsar Secretariat to draw attention to the important role of wetlands in fisheries resources conservation and sustainable use through its ongoing CEPA activities, in particular through future World Wetlands Day celebrations and events;
39. REQUESTS the Secretary General to pursue appropriate partnerships with expert bodies or organizations such as The WorldFish Center and FAO that are concerned with fisheries resources/resource conservation and sustainable use, in order for the Ramsar Convention to gain further advice and to fulfill its mandate;

40. REQUESTS the STRP to consider ways and means of elaborating the annex to this Resolution, taking into account the findings of the Millennium Ecosystem Assessment (MA), the Comprehensive Assessment of Water Management in Agriculture (CA), and other relevant assessments, in order to provide further guidance for Contracting Parties on wetlands and their relation to sustainable fisheries; and
41. ENCOURAGES Contracting Parties to assist fishers in gaining access to environmentally friendly technologies for fisheries and related activities.

The Ramsar Convention 'toolkit' for the conservation and wise use of wetlands, 4th ed. (2010)

Convention pillar 1: Wise Use

Handbook 1	Wise use of wetlands Concepts and approaches for the wise use of wetlands
Handbook 2	National Wetland Policies Developing and implementing National Wetland Policies
Handbook 3	Laws and institutions Reviewing laws and institutions to promote the conservation and wise use of wetlands
Handbook 4	Avian influenza and wetlands Guidance on control of and responses to highly pathogenic avian influenza
Handbook 5	Partnerships Key partnerships for implementation of the Ramsar Convention
Handbook 6	Wetland CEPA The Convention's Programme on communication, education, participation, and public awareness (CEPA) 2009-2015
Handbook 7	Participatory skills Establishing and strengthening local communities' and indigenous people's participation in the management of wetlands
Handbook 8	Water-related guidance An Integrated Framework for the Convention's water-related guidance
Handbook 9	River basin management Integrating wetland conservation and wise use into river basin management
Handbook 10	Water allocation and management Guidelines for the allocation and management of water for maintaining the ecological functions of wetlands
Handbook 11	Managing groundwater Managing groundwater to maintain wetland ecological character
Handbook 12	Coastal management Wetland issues in Integrated Coastal Zone Management
Handbook 13	Inventory, assessment, and monitoring An Integrated Framework for wetland inventory, assessment, and monitoring
Handbook 14	Data and information needs A Framework for Ramsar data and information needs
Handbook 15	Wetland inventory A Ramsar framework for wetland inventory and ecological character description
Handbook 16	Impact assessment Guidelines on biodiversity-inclusive environmental impact assessment and strategic environmental assessment

Convention pillar 2: Ramsar sites designation and management

Handbook 17	Designating Ramsar Sites Strategic Framework and guidelines for the future development of the List of Wetlands of International Importance
Handbook 18	Managing wetlands Frameworks for managing Ramsar Sites and other wetlands
Handbook 19	Addressing change in wetland ecological character

Convention pillar 3: International cooperation

Handbook 20	International cooperation Guidelines and other support for international cooperation under the Ramsar Convention on Wetlands
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Companion document

Handbook 21	The Ramsar Convention Strategic Plan 2009-2015 Goals, strategies, and expectations for the Ramsar Convention's implementation for the period 2009 to 2015
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Ramsar
Handbooks
4th edition

Handbook 18

Managing wetlands



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