10th Meeting of the Conference of the Parties to the Convention on Wetlands (Ramsar, Iran, 1971)

"Healthy wetlands, healthy people"

Changwon, Republic of Korea,
28 October-4 November 2008

Agenda item XV **Ramsar COP10 DR 15**

Draft Resolution X.15

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

Submitted by the Scientific & Technical Review Panel (STRP)

1. AWARE of the suite of technical and scientific guidelines and other materials prepared by the Scientific and Technical Review Panel (STRP) to support Contracting Parties in their implementation of wetland conservation and wise use;

2. NOTING that the 9th meeting of the Conference of the Contracting Parties (COP9) instructed the STRP to prepare further advice and guidance for consideration by Contracting Parties at COP10 that would focus upon the immediate and high priority tasks set out in Annex 1 to Resolution IX.2; and

3. THANKING the STRP for its work in preparing the advice and guidance annexed to this Resolution as part of its high priority work during the 2006-2008 triennium;

THE CONFERENCE OF THE CONTRACTING PARTIES

4. WELCOMES the guidance on "Describing the ecological character of wetlands, and harmonized data formats for core inventory" provided in the annex to this Resolution, and URGES Contracting Parties to make good use of it as appropriate, adapting it as necessary to suit national conditions and circumstances, within the frameworks of existing regional initiatives and commitments and in the context of sustainable development;

5. CONFIRMS that the summary description and structure of core data fields for wetland inventory included in the annex to this Resolution update and wholly supersede the earlier guidance on this matter adopted as Table 2 in the annex to Resolution VIII.6;

6. URGES Contracting Parties to draw this guidance to the attention of relevant stakeholders, including in particular those responsible for the management of Ramsar sites and other wetlands;

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7. REQUESTS Contracting Parties and those responsible for the management of Ramsar sites to apply this guidance in the preparation of descriptions of the ecological character of Ramsar sites, including as part of their management planning processes, such that these descriptions provide a basis for detecting and reporting change in ecological character as required by Article 3.2 of the Convention text, and ALSO REQUESTS Contracting Parties to provide any completed descriptions of the ecological character of Ramsar sites to the Secretariat as a supplement to the information provided in the Information Sheet on Ramsar Wetlands (RIS);

8. INSTRUCTS the Scientific and Technical Review Panel to include in its work plan for the 2009-2012 period the development of further guidance on describing ecological character, to include to the extent practicable:

   i) further operational guidance for practitioners on completing the ecological character description sheet for sites;
   ii) guidance and information on using relevant conceptual models;
   iii) cross-references, where available, from each relevant description sheet data field to worked examples, case studies or other sources of potential, actual or *de facto* standards for completing the fields; and
   iv) a review of practical implementation experiences, with lessons learned; and

9. INSTRUCTS the Ramsar Secretariat to disseminate widely this guidance on "Describing the ecological character of wetlands, and data needs and formats for core inventory" annexed to this Resolution, including through amendment and updating of the Ramsar Wise Use Handbooks.

Annex

Describing the ecological character of wetlands, and harmonized data formats for core inventory

CONTENTS

1. The ecological character concept and the need for methods for describing ecological character

1. The text of the Ramsar Convention includes in Article 3.2 the requirement 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". Through a series of COP decisions (principally the Strategic Plan adopted in 1996 and Resolution VIII.8 in 2002), the requirement in Article 3.1 to "promote the conservation" of Ramsar sites has been equated to "maintenance of the ecological character" of these sites.

2. Furthermore, the current description of "wise use" (paragraph 22 of Resolution IX.1 Annex A) makes explicit the link between maintenance of ecological character and wise use, such that the concept of maintaining ecological character can and should be applied to all wetlands, rather than only designated Ramsar sites:

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

3. The current definition of "ecological character" (paragraph 15 of Resolution IX.1 Annex A) is:

> "Ecological character is the combination of the ecosystem components, processes and benefits*/services that characterise the wetland at a given point in time."
>
> *Within this context, ecosystem benefits are defined in accordance with the MA [Millennium Ecosystem Assessment] definition of ecosystem services as "the benefits that people receive from ecosystems".

4. Whilst a definition of "ecological character" is helpful, it is also important to be able to describe the particular ecological character of a wetland as a key element of an effective management planning process, including monitoring, as is set out in the wetland management planning guidance in Ramsar Wise Use Handbook 16 (3rd ed.). It also follows that if human-induced adverse change in the ecological character of a designated Ramsar site is to be detected and reported under Article 3.2 of the Convention text, a baseline description of ecological character is needed against which to assess change.

5. The lack of guidance to Contracting Parties and wetland site managers on methods for describing ecological character was recognized in annex 2 to Resolution IX.2 (paragraph 52), which requested the Scientific and Technical Review Panel (STRP) to prepare "guidance for the description of the ecological character of wetlands".

6. The guidance developed in response and provided here therefore moves beyond the *definition* of the concept to a treatment of the *constituent parts of what goes to make up* ecological character, and this can be applicable to any wetland in the context of documenting core aspects of an inventory of wetlands (see Resolution VIII.6) and to completing the Information Sheet on Ramsar Wetlands (RIS) for any given Ramsar site.

7. This work is key to the establishment of baselines against which Article 3.2 and relevant Convention indicators and other assessments (and reporting on these) will operate. It follows that, in order to make consistent and simplify the provision of information on Ramsar sites, which is closely linked to related core inventory and ecological character descriptions (see Section 2 below), revisions to the structure and content of the Information Sheet on Ramsar Wetlands (RIS) may prove to be appropriate and could

potentially simplify the RIS data and information needs. Substantive review and recommendations on this matter are not included in this guidance, but will be the subject of further work to be undertaken by the STRP concerning different aspects of overall Ramsar data and information needs, and data and information management for Ramsar sites (see also [COP10 DR14] *A Framework for Ramsar data and information needs*).

8. The development of this guidance has also found that, for harmonization of data and information collection purposes, there is a need to make some modifications to the structure, content and titling of the core fields for wetland inventory as adopted in the annex to Resolution VIII.6. A revised set of recommended core inventory data fields, compared with those for ecological character description, is provided in Section 6.

9. The preparation of the guidance on describing ecological character has also permitted some reflection on the Convention's definition of ecological character (paragraph 3 above), referred to above. While it is certainly correct that the concept should embrace ecosystem components, processes and services, the definition makes clear that ecological character consists not simply of a *list* of these, but includes the additional idea of what they represent *in combination*. The dividing-line between what is counted as a component, or a process, or a service, may not always be sharply distinguished. For example, "water regime" is included in "components" in the scheme provided below, but might also be regarded as a "process". Long debate on this would not be fruitful, however, since these categorizations are pragmatic expedients, and the key principle is that ecological character is a holistic rather than a reductionist concept.

10. In any guidance on ecological character description, there will be a need to map out the various different purposes for, and uses of, this description and how these differ from the purposes of core wetland inventory, as well as RIS and Article 3.2 reporting. For example, the uses of an ecological character description identified during the ongoing Australian work of developing ecological character descriptions (described below) include:

    i) providing the basis for a summary ecological character description in the RIS;
    ii) informing management planning; informing monitoring; and
    iii) providing information to assist in implementing legislation such as EIA legislation that relates to Ramsar sites.

2. A summary framework of data and information for core inventory, ecological character description, Ramsar site designation and Article 3.2 reporting

11. There are close relationships between the types of data and information which are, and need to be, collected for the purposes of core inventory, ecological character description, Ramsar site designation, and Article 3.2 reporting.

12. Figure 1 provides a comparative framework of the major types of data and information required for each of these purposes. To this could be added a column for data and information needed for management plans, and the STRP anticipates reviewing this aspect in its future work.

13. All four of these purposes require a description of ecological character for the site, and through harmonization of these data and information fields this would then need to be done only once for all four purposes, hence avoiding a significant duplication of effort that

may otherwise occur at present. Three of the purposes need similar administrative and locational details. Core inventory and the RIS need some conservation activity information, and although the level of detail might be different, again the same structure of data fields can be used.

14. The unique section of data and information needed for the RIS is its statement of the international importance of the wetland, made against each of the Criteria applied in the designation of the site, and the data and information provided to justify the application of these Criteria (Ramsar Wise Use Handbook 14 *Designating Ramsar sites*, 3rd edition 2007). This distinction between the description of the international importance of a Ramsar site and the description of its overall ecological character has not always been kept clear.

15. The comparative analyses of the structure and content of the data and information for Ramsar site designation in relation to core inventory and ecological character description outlined below have shown that all current RIS information fields, with the exception of the international importance statement, relate to one or other of the data and information fields for core inventory and ecological character description. However, the present sequence and grouping of information fields in the RIS, and the nomenclature used, differ in a number of respects from those in the ecological character description and core inventory fields.

16. Thus in many instances the data and information categories required are the same for these different purposes, 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 this guidance 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.

17. It is largely dependent on each Contracting Party's priorities and chosen purposes whether the relevant data and information is collected first for core wetland inventory, for ecological character description (e.g., for management planning purposes), or for the preparation of an RIS for Ramsar site designation. As indicated above, whichever the first purpose applied, much of the data and information collected can be used for the other purposes. Thus, for example, completion of the ecological character description should directly provide the information (in summarized form) for core inventory and the RIS. Reports made under Article 3.2 would also be drawn directly from the data and information in the ecological character description.

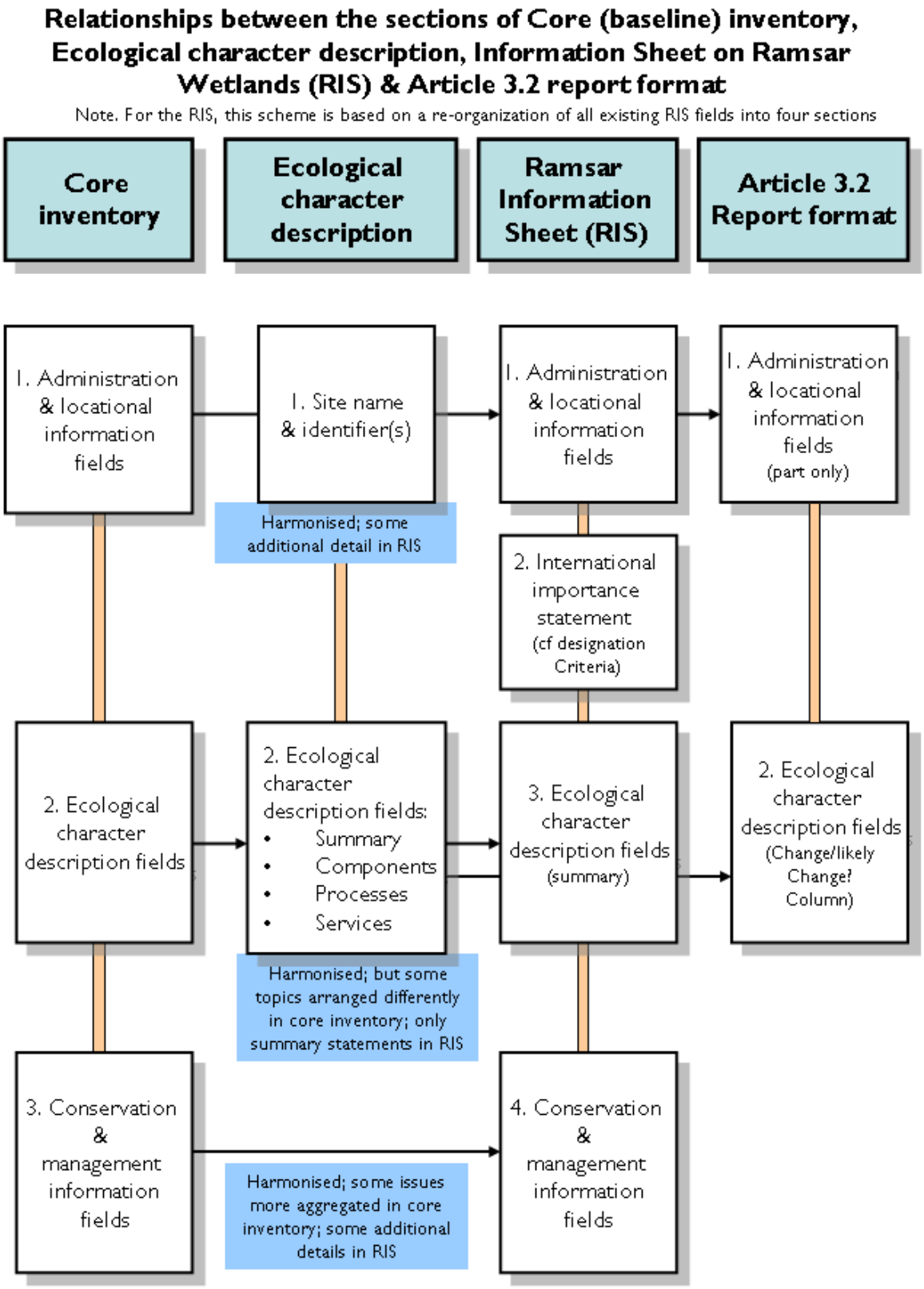

Figure 1. A summary framework for data and information needs for core inventory, ecological character description, Ramsar site designation, and Article 3.2 reporting

3. How guidance on wetland ecological character description and harmonization with core inventory has been developed

18. To develop harmonized general guidance on wetland ecological character description, core inventory and related processes, a number of cross-tabulation comparison analyses were developed, including comparisons between:

    i) core inventory fields (Resolution VIII.6) and RIS data and information fields;
    ii) RIS data and information fields and the fields in a "framework for describing the ecological character of Ramsar wetlands" published in 2005 by the government of the State of Victoria (Australia);
    iii) the fields in Victoria's "framework for describing the ecological character of Ramsar wetlands" and the RIS fields;
    iv) core inventory fields (Resolution VIII.6) and the fields in Victoria's "framework for describing the ecological character of Ramsar wetlands"; and
    v) Victoria's "framework for describing the ecological character of Ramsar wetlands" fields and those in the draft (1 August 2007) Australia Commonwealth government's "National Framework and Guidance for Describing the Ecological Character of Australia's Ramsar Wetlands".

19. These analyses revealed a number of issues that have been taken into account in the development of the ecological character description field structure provided in Section 4 below. One of these is that some of these schemes did not include a field for recording information on wetland type(s) present (in terms of the Ramsar classification of wetland type), which has been added as an ecological character description field. Similarly, the "pressures, vulnerabilities and trends" field (in the Resolution VIII.6 core inventory fields) has been added in the ecological processes section of the description. In general, however, the content and structure of the ecological character description below has been kept as close as possible to the various existing inventory and ecological character schemes.

20. In developing the framework below, the work by Australia in developing detailed methods for describing the ecological character of their wetlands proved particularly valuable, and Australia is to be congratulated on these initiatives. Further information on these approaches and their guidance for making ecological character descriptions can be found for the State of Victoria's 2005 report at: http://www.dse.vic.gov.au/DSE/nrence.nsf/LinkView/25C78F0422CD4887CA25729D0000B8A048DB09C3A9A254C5CA257297001AE7C0 and for the draft (2007) National Framework and Guidance at: http://www.environment.gov.au/about/publications/index.html.

21. It is clear that no one scheme such as that provided in Section 4 for global applicability can possibly meet all the particular needs and differences of purpose, capacity, and available data and information. It should be used, however, as the basis for development of ecological character descriptions by Contracting Parties that fit their need, capacity and purpose.

4. A framework for describing the ecological character of wetlands

22. Taking account of the analyses described above, a global scheme for describing wetland ecological character in the context of the Ramsar Convention is provided in tabular format

below. Some guidance on implementing the approach is provided below in paragraphs 25-28. For an explanation of purposes relating to Article 3.2 reporting for the inclusion of the "Change/likely change?" column in the ecological character description, see Section 5 below.

23. In addition to the "Change/likely change?" column, a further refinement that Contracting Parties and wetland managers may wish to add, where appropriate and possible, is a further column identifying "Limits of acceptable change, where defined" (see also Section 5 below). This speaks to the role of the ecological character description in management planning, including monitoring, and also to determining when an Article 3.2 report of non-trivial change in ecological character would be needed. Further discussion on limits of acceptable change and trivial/non-trivial change in ecological character is provided in COP10 DOC.27.

24. In the description sheet below (Table 1), 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).

Table 1. Ramsar ecological character description sheet

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?
Two or three narrative sentences giving a statement of what is ecologically *distinctive* (not necessarily *important*) about the site, based on the details below. (With reference to the COP 9 definition, this concerns *the combination of* the components, processes and services that *characterise* the wetland (emphasis added)). Note. Supplementing the summary statement with simple conceptual models of the key characteristics of the wetland is encouraged.		[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)		

25. **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.

26. **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.

27. **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).

28. **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.

5. Change in ecological character and Article 3.2 reporting

29. A related aspect of Ramsar implementation concerning wetland ecological character involves detecting and reporting human-induced adverse change in the ecological character of a Ramsar-listed wetland. One of the tasks requested of the Ramsar Secretariat by the Conference of the Parties concerned assisting Contracting Parties when they need to make such a report to the Secretariat through the provision of a simple Article 3.2 reporting format.

30. Since it follows that identifying such a change is based on its detection by comparison with the description of the ecological character of the wetlands, and with any established limits

of unacceptable change in ecological character, the approach developed here is to use the ecological character description format and the additional column for describing "Change/likely change" to make such Article 3.2 reports.

31. Thus using a copy of the completed ecological character format for a given site, with relevant details entered into this column, can act as the simple alert mechanism required to trigger the processes (see [COP10 DR16]) for implementing Article 3.2 requirements and for submitting the Article 3.2 report to the Ramsar Secretariat.

6. Harmonizing the ecological character description and the core fields for wetland inventory

32. Core fields for wetland inventory were agreed by the Parties in 2002 in the annex to Resolution VIII.6. A further aspect of the STRP's work on data and information needs for wetlands, including Ramsar sites (2006-2008 STRP work plan task 52), concerned "harmonization of the layout and information fields of the RIS with the core data fields of the Framework for wetland inventory and the description of ecological character".

33. As noted above, further work by the STRP will address the RIS-related aspects of this task. This section of guidance provides advice only on the harmonization of core inventory and ecological character description fields.

34. The cross-comparison analyses described above in section 3 identified a number of aspects of the original core inventory fields where harmonization of terminologies and structure and content descriptions of data and information fields could be made, in order to facilitate the sharing of data and information between inventory and ecological character description processes.

35. Table 2 provides the revised core inventory fields, and these supersede those in the annex to Resolution VIII.6. Table 3 provides a comparison of how these revised core inventory fields relate to the ecological character description fields from Table 1.

Table 2. Revised core wetland inventory data and information fields

Revised core wetland inventory fields **(Harmonized with Ramsar ecological character description sheet)**
Site name: Official name of site and catchment/other identifier(s) (e.g., reference number)
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)
Location: Projection system, map coordinates, map centroid, elevation
Geomorphic setting: Setting in the landscape/catchment/river basin - including altitude, upper/lower zone of catchment, distance to coast where relevant, etc.
Biogeographical region:
Climate: Overview of prevailing climate type, zone and major features (precipitation, temperature, wind)

Soil: Geology, soils and substrates; and soil biology
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
Water chemistry: Temperature; turbidity; pH; colour; salinity; dissolved gases; dissolved or suspended nutrients; dissolved organic carbon; conductivity
Biota: Plant communities, vegetation zones and structure (including comments on particular rarity, etc.); Animal communities (including comments on particular rarity, etc.); 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)
Land use: Local, and in the river basin and/or coastal zone
Pressures and trends: Concerning any of the features listed above, and/or concerning ecosystem integrity
Land tenure and administrative authority: For the wetland, and for critical parts of the river basin and/or coastal zone
Conservation and management status of the wetland: Including legal instruments and social or cultural traditions that influence the management of the wetland
Ecosystem services: [for a list of relevant ecosystem services, see the Ramsar ecological character description sheet]
Management plans and monitoring programs: In place and planned within the wetland and in the river basin and/or coastal zone (see Resolutions 5.7, VI.1, VII.17, and VIII.14)

Table 3. The relationship between ecological character description and core wetland inventory fields

Ramsar ecological character description sheet	Core inventory fields (revised)
Site name: Official name of site and catchment)/other identifier(s) (e.g., reference number)	
	Administrative and locational details
	Site name: Official name of site and catchment/other identifier(s) (e.g., reference number)
	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)
	Location: Projection system, map coordinates, map centroid, elevation
	Biogeographical region
	Land tenure and administrative authority: For the wetland, and for critical parts of the river basin and/or coastal zone

	Ecological character
1. Summary statement	
Two or three narrative sentences giving a statement of what is ecologically *distinctive* (not necessarily *important*) about the site, based on the details below. (With reference to the COP 9 definition, this concerns *the combination of* the components, processes and services that *characterise* the wetland (emphasis added)).	(Not part of core inventory)
2. Ecological components	
2.1 Geomorphic setting: Setting in the landscape/catchment/river basin - including altitude, upper/lower zone of catchment, distance to coast where relevant, etc.	**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)	**Climate:** Overview of prevailing climate type, zone and major features
2.3 Habitat types (including comments on particular rarity, etc.), and Ramsar wetland types	Part of section on **biota:** Plant communities, vegetation zones and structure (including comments on particular rarity, etc.)
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)	[In administrative and locational details section above.]
2.6 Plant communities, vegetation zones and structure (including comments on particular rarity, etc.)	Part of section on **biota:** Plant communities, vegetation zones and structure (including comments on particular rarity, etc.); (See under administrative and locational details above)
2.7 Animal communities (including comments on particular rarity, etc.)	Part of section on **biota:** 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)	Part of section on **biota:** 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)Part of section on **biota:** Animal communities (including comments on particular rarity, etc.);
2.9 Soil: Geology, soils and substrates; and soil biology	**Soil:** Geology, soils and substrates

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	**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	(Incorporated in "Water regime" above)
2.12 Stratification and mixing regime	
2.13 Sediment regime (erosion, accretion, transport and deposition of sediments)	
2.14 Water turbidity and colour	Part of section on **Water chemistry:** Turbidity; colour
2.15 Light - reaching the wetland (openness or shading) and attenuation in water	(Incorporate as appropriate in vegetation and chemistry sections above)
2.16 Water temperature	Part of section on **Water chemistry:** Temperature
2.17 Water pH	Part of section on **Water chemistry:** pH
2.18 Water salinity	Part of section on **Water chemistry:** Salinity
2.19 Dissolved gases in water	Part of section on **Water chemistry:** Dissolved gases
2.20 Dissolved or suspended nutrients in water	Part of section on **Water chemistry:** Dissolved or suspended nutrients
2.21 Dissolved organic carbon	Part of section on **Water chemistry:** Dissolved ortganic carbon
2.22 Redox potential of water and sediments	(Incorporate in chemistry section if appropriate)
2.23 Water conductivity	(Incorporate in chemistry section if appropriate)

3. Ecological processes	
3.1 Primary production (S)*	(Not included)
3.2 Nutrient cycling (S)*	
3.3 Carbon cycling	
3.4 Animal reproductive productivity	(Incorporate as necessary in section on **biota**)
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 and trends concerning any of the above, and/or concerning ecosystem integrity	**Pressures and trends:** Concerning any of the features listed above, and/or concerning ecosystem integrity
4. Ecosystem services	
4.1 Drinking water for humans and/or livestock (P)*	**Ecosystem services:**

4.2 Water for irrigated agriculture (P)*	(Derive summary, to length appropriate, of the aspects documented in the character description sheet as listed in fields 4.1 - 4.27 on the left)
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)*	
(For nature conservation value as an ecosystem 'service' (S), see items under 'components' and 'processes' above)*	
	Conservation and management
	Conservation and management status of the wetland: Including legal instruments and social or cultural traditions that influence the management of the wetland
	Management plans and monitoring programs: In place and planned within the wetland and in the river basin and/or coastal zone (see Resolutions 5.7, VI.1, VII.17, and VIII.14)
	Land use : Local, and in the river basin and/or coastal zone

* Ecosystem Services are categorised as "provisioning" (P), "regulating" (R), cultural (C) or "supporting" (S) according to the categorization in the Millennium Ecosystem Assessment. Some may appear in the "processes" section as well as the "services" section above.