

Wetland inventory, assessment and monitoring: Practical techniques and identification of major issues

Introduction and review of past recommendations

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Abstract

A review of recommendations from previous international conferences and workshops on wetland inventory, assessment and monitoring is provided. This lists the main recommendations from each meeting and summarises them as:

- Collection of long-term data on wetlands;
- Standardisation of techniques, guidelines and manuals;
- Provision of training;
- Reviewing gaps and co-ordination of data collection;
- Developing and making greater use of networks; and
- Developing means to audit existing effort.

In many cases, however, the recommendations have not been enacted and little progress made. An exception is the inventory project that was developed under the Mediterranean wetland program known as MedWet. This program received institutional and financial backing and was able to achieve its objectives through participation of technical experts from a number of countries and organisations. The lessons learnt from these experiences are given as examples in developing further programs.

Keywords: wetland inventory, wetland assessment, wetland monitoring, Ramsar Convention

Introduction

Inventory, assessment and monitoring are vital components of effective wetland management. Together they provide the essential data and information that support management decisions (Dugan 1990, Finlayson 1996a). Furthermore, they provide feedback on management actions and implementation of principles and frameworks to ensure that they deliver the information

necessary for managers and other decision makers (Finlayson 1996b). With the recognition that inventory, assessment and monitoring cannot be treated separately from management processes, increasing attention has focused on the design and implementation of effective and integrated programs.

For inventory, a global review of wetland inventories (GRoWI) for the Ramsar Convention has recommend future good practice and priorities (Finlayson & Davidson 1999, Finlayson et al 1999). For assessment, the Ramsar Convention in conjunction with the Environmental Research Institute of the Supervising Scientist, Australia, has developed a framework for conducting wetland risk assessment as an integral component of management planning processes (van Dam et al 1999). For monitoring, general principles and frameworks have been developed, for example under the Ramsar Convention (Finlayson 1996b) and the Mediterranean wetland initiative (MedWet) (Finlayson 1996c, Grillas 1996, Tomàs Vives & Grillas 1996).

The aims of this workshop, held as a part of the 2nd International Conference on Wetlands and Development (Dakar, Senegal, 10–14 November 1998) were to review past and current projects, and to develop recommendations for further implementation of wetland inventory, assessment and monitoring.

The main objectives were to:

- promote the inventory, assessment and monitoring of wetlands, through discussion of practical approaches, methodologies and techniques;
- identify the working tools needed to improve delivery of wetland inventory and assessment; and
- identify priorities for wetland inventory and assessment in support of biodiversity conservation in Africa.

Previous conference recommendations

Several major wetland conferences during the last 10 years have produced recommendations for improved wetland inventory, assessment and monitoring. Those that are most relevant to the objectives of this workshop are summarised below.

Managing Waterfowl Populations (Matthews 1990) — IWRB, Astrakhan, Russia (former USSR), 2–5 October 1989

This conference was convened by the International Waterfowl and Wetland Research Bureau (IWRB) at the invitation of the USSR State Committee for Environment Protection. Six technical sessions were held to discuss the distribution, status and management, with an emphasis on hunting, of waterfowl. The conference was attended by more than 150 wetland scientists and marked a turning point in open contact between scientists from both sides of the ‘Iron Curtain’ that divided Europe at the time. Recommendations specific to waterbird inventory, assessment and monitoring are listed below:

- Collect long-term data on waterbird populations for an understanding of population processes and as a basis for conservation actions;
- Provide regular feedback of data and information to participants involved in surveys;
- Standardise and promote procedures used for data collection;

- Develop a manual for sampling waterbird populations and hold training workshops;
- Address gaps in regional waterbird data sets with relevant national and local personnel.

Managing Mediterranean wetlands and their birds for the Year 2000 and beyond (Finlayson et al 1992) — IWRB, Grado, Italy, 3–10 February 1991

This conference was convened by the International Waterfowl and Wetland Research Bureau (IWRB) at the invitation of the Regione Friuli-Venezia Giulia, Italy. Specific technical sessions and workshops were used to develop a strategy to stop and reverse wetland loss and degradation in the Mediterranean (*A strategy to stop and reverse the wetland loss and degradation in the Mediterranean basin* 1992). The conference was attended by approximately 280 wetland experts from 28 countries and principally addressed wetland management issues. Recommendations specific to wetland inventory, assessment and monitoring are listed below:

- Develop an inventory and assess all water resources of the Mediterranean;
- Strengthen monitoring procedures for Ramsar sites.

Old world and new world wetlands (Mitsch 1994) — Intecol Wetland Conference, Columbus, USA, 13–8 September 1992

This conference was organised by the School of Natural Resources, The Ohio State University, USA, on behalf of the International Society of Ecology (Intecol). A total of 905 wetland experts attended to discuss a variety of wetland topics as outlined in more than 500 papers. Several formal resolutions were adopted at the conference and those relevant to wetland inventory, assessment and monitoring are listed below:

- Develop and adopt an international classification system and guidelines for national wetland inventories;
- Establish an international committee to develop these (IWRB/IUCN/Ramsar) and promote their use.

Waterfowl and wetland conservation in the 1990s — A global perspective (Moser et al 1993) — IWRB, St Petersburg Beach, Florida, USA, 12–19 November 1992

This conference was convened by the International Waterfowl and Wetlands Research Bureau (IWRB) at the invitation of the United States Department of the Interior, Fish and Wildlife Service. Six technical workshops were held to review specific wetland and waterbird topics and provide guidance to IWRB as it developed its workplan for 1993–95. The conference was attended by approximately 240 wetland experts from 54 countries. Recommendations specific to wetland inventory, assessment and monitoring are listed below:

- Continue and extend the International Waterbird Census and collect information on waterbird habitats;
- Coordinate international data and overviews by continuing and extending the International Waterbird Census and collect information on waterbird habitats;
- Disseminate the results of monitoring waterbird populations and wetlands;
- Develop a set of criteria and a manual for measuring ecological change;

- Prepare materials for and undertake training courses on monitoring ecological change;
- Review existence of and fill gaps in national wetland inventories;
- Develop techniques and manuals for data collection and making inventories more useful;
- Develop techniques for socio-economic assessments of wetlands;
- Develop a communications network for inventory and monitoring experts.

International conference on wetlands and development (Prentice & Jaensch 1997) — Wetlands International, Kuala Lumpur, Malaysia, 9–13 October 1995

This conference was organised by the Asian Wetland Bureau (AWB), the International Waterfowl and Wetland Research Bureau (IWRB), and Wetlands for the Americas (WA), and hosted by the Ministry of Science, Technology and the Environment, the Selangor State Government and the Institute of Advanced Studies, University of Malaya. Four technical workshops were held to address global issues of wetland conservation and management in a changing world. About 290 delegates from 60 countries participated. Recommendations specific to wetland inventory, assessment and monitoring are presented below:

- Establish links for open exchange of monitoring information between agencies and NGOs;
- Develop guidelines and standards for monitoring ecological change in wetlands;
- Develop means of evaluating and auditing wetland monitoring programs;
- Develop and maintain databases of monitoring programs in different regions;
- Provide technical support and training for design of monitoring programs;
- Develop standardised techniques and manuals for monitoring specific threats to wetlands.

Common recommendations from previous conferences

Recommendations from these meetings have been broadly consistent and can be grouped under six common themes:

- Collection of long-term data on wetlands;
- Standardisation of techniques, guidelines and manuals;
- Provision of training;
- Reviewing gaps and co-ordination of data collection;
- Developing and making greater use of networks; and
- Developing means to audit existing effort.

The consistency of the recommendations may be partly attributable to a degree of consistency of attendance and participation of personnel from or associated with Wetlands International (formerly IWRB). However, as the conferences were held in different geographic locations it is likely that many other, and different, interests were also represented: the bulk of participants were not the same. Further, the nature of the meetings, as reflected in their titles, has profoundly broadened from a focus on waterbirds, to waterbirds and their habitats, and then to wetlands and their management. The outcomes thus represent a decade of developing

interest in wetlands and an increasing awareness that wetland inventory, assessment and monitoring was either needed or, where it existed, was inadequate.

Implementation of previous recommendations

There is, however, little evidence that all these recommendations listed above have been widely implemented, if at all. Whilst many of the recommendations are worthy they have proved to be unrealistic and possibly over-ambitious given the past and present levels of institutional capacity and capability on the ground. Unfortunately it seems that the rhetoric and *bon homie* of the conferences (and their workshops) have been difficult to translate into on-the-ground action after the conference. Realistic recommendations with clear mechanisms for implementation are needed. This need was also apparent in the Ramsar Convention review of wetland inventory (Finlayson & Davidson 1999, Finlayson et al 1999).

A major exception to the general lack of implementation is provided by the Mediterranean wetlands program MedWet, which has contributed substantively to standardising techniques for wetland inventory (Costa et al 1996) and monitoring (Tomàs Vives 1996). MedWet has its origins in the conference *Managing Mediterranean wetlands and their birds for the year 2000 and beyond* (Finlayson et al 1992) held in Grado, Italy in 1991 (see above). Like other wetland conferences, the Grado conference presented a large number of recommendations, culminating in a far-reaching and controversial statement known as the Grado Declaration (see Finlayson et al 1992).

Unlike other conferences, the Grado symposium was regionally oriented and a program to enact at least some of the recommendations was developed further after the conference was held and the proceedings published. Its implementation was facilitated by the receipt of major project funding from the European Commission. The MedWet inventory, assessment and monitoring initiative, developed through this funding, now operates as just one part of a much broader, and expanding, Mediterranean wetlands program being implemented under the *aegis* of the Ramsar Convention on Wetlands. Above all, the Medwet program demonstrates that all the conference talking can, with the right amount of will and resourcing, be translated into action and delivery. The MedWet inventory methodology is described by Costa et al (2001).

Yet as many of the papers in this proceedings (and the recent global assessment of the state of wetland inventory; Finlayson & Spiers 1999) describe, there remains a very long way to go to achieve adequate and consistent delivery of wetland inventory, assessment and monitoring.

Practical implementation of inventory recommendations

The success of the MedWet program is illustrative, but it should not shield the reality that this success has not been replicated elsewhere. Other regional conferences and workshops have not succeeded in this manner and further wetland inventory, assessment and monitoring is still urgently needed. This was shown by the regional reviews of the Ramsar Convention's inventory project (see reports in Finlayson & Spiers 1999). Thus, if we are to see further improvement in wetland inventory, assessment and monitoring we need to also identify processes that can translate recommendations into action.

In order to promote the discussion of practical techniques for wetland inventory, assessment and monitoring the Dakar workshop was purposefully linked with two other workshops. The first was a component of the Ramsar project to review the global extent of wetland inventory (*Global review of wetland resources and priorities for wetland inventory (GRoWI)*; Finlayson & Davidson 1999, Finlayson et al 1999) which had the dual purpose of reviewing the extent of wetland resources and identifying gaps in wetland inventory and inventory techniques. The

second was a Biodiversity Conservation Information System (BCIS) workshop that began development of a suite of wetland inventory and assessment implementation activities.

These workshops provided a backdrop for our discussion on practical techniques for wetland inventory, assessment and monitoring. However, this background was not overly positive — it had not been possible to present many examples of standardised techniques, nor to provide a reliable estimate of the extent of the global wetland resource (a preliminary minimum estimate was 12.8 million km²). Thus, the workshop on practical techniques commenced with the backdrop of a totally inadequate estimate of the extent, let alone the condition of the global wetland resource.

Thus, as well as hearing about a number of current and recent initiatives on wetland inventory and assessment, the workshop provided an opportunity to test the ideas emerging from the earlier two workshops with a very wide-ranging audience for evaluation, and particularly to learn more about the issues and needs in an African context. As one of the papers in the proceedings (Stevenson & Frazier 2001) outlines, wetland inventory in Africa is scant and patchy, although not necessarily any more or less so than in most other parts of the world (Finlayson & Spiers 1999).

We are pleased to report that a number of the recommendations from the workshop (Finlayson et al 1999) are already being taken forward, notably through implementation by the Ramsar Convention and its partner organisations such as Wetlands International of Resolution VII.20 of the Convention's meeting of the Conference of Parties in Costa Rica in May 1999. This Resolution (see appendix 1) was developed from the recommendations of the GRoWI analyses, the preparation of which were in turn assisted by the discussions in this 1998 Senegal workshop. Substantive steps are now being taken to both develop standardised guidance and protocols for wetland inventory, the database tools to compile and make new inventory information available, and national inventory in several parts of the world.

Although it is a globally daunting task to then undertake the inventory work itself in the many parts of the world where such vital baseline information is lacking, we hope that by the time a future meeting on the topic takes place there will be much progress to report. That would provide both a practical demonstration of capacity-building for the sustainable use of wetlands — and that not all conferences are just hot air.

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Appendix 1 People and wetlands: The vital link

7th Meeting of the Conference of the Contracting Parties to the Convention on Wetlands (Ramsar, Iran, 1971), San José, Costa Rica, 10–18 May 1999

Resolution VII.20 — Priorities for wetland inventory

1. RECALLING Recommendation 1.5 which called upon Contracting Parties to prepare inventories of their wetlands *as an aid to the formulation and implementation of national wetland policies* to assist in promoting the wise use of wetlands in their territory;
2. RECALLING ALSO Recommendation 4.6, Resolutions 5.3 and VI.12, and Action 6.1.2 of the Strategic Plan 1997–2002 which recognised the value of national scientific inventories for identifying sites suitable for inclusion in the List of Wetlands of International Importance (Ramsar List) under the Convention;
3. AWARE of Action 6.1.3 of the Strategic Plan 1997–2002 which calls upon the Ramsar Bureau and the International Organisation Partners to *utilise information from regional wetland directories, national scientific inventories of wetlands and other sources, to begin development of a quantification of global wetland resources, as baseline information for considering trends in wetland conservation or loss*;
4. NOTING the report entitled *Global review of wetland resources and priorities for wetland inventory* and its recommendations as prepared and presented by Wetlands International to Technical Session IV of this Conference, in response to Action 6.1.3 of the Strategic Plan 1997–2002;
5. APPRECIATIVE of the financial support provided for the preparation of the above report by the Governments of the Netherlands, Norway, and the United Kingdom;
6. NOTING WITH CONCERN the findings of the Wetlands International report that, based on the information gathered within the constraints of this project, few countries, if any, have comprehensive national inventories of their wetland resources, and that it is therefore not possible to provide a baseline of the world's wetland resources with any confidence;
7. RECOGNIZING the priorities for future wetland inventory, both in terms of types and regions, as identified in the report and endorsed by the Second International Conference on Wetlands and Development (Dakar, Senegal, November 1998);
8. CONSIDERING that this Conference has also adopted *Guidelines for developing and implementing National Wetlands Policies* (Resolution VII.6), the *Wetland Risk Assessment Framework* (Resolution VII.10), the *Strategic Framework and guidelines for the future development of the List of Wetlands of International Importance* (Resolution VII.11), and Resolution VII.17 on *Restoration as an element of national planning for wetland conservation and wise use*, all of which, as noted by the previous Resolutions and Recommendations referred to in paragraphs 1 and 2 above, would be greatly assisted by the availability of national scientific inventories;
9. TAKING ACCOUNT of the findings given in the report prepared by the World Conservation Monitoring Centre and presented to COP7 Technical Session IV entitled *Shared wetlands and river basins of the world*; and
10. NOTING the scope of the proposed Millenium Assessment of the World's Ecosystems, currently under development, to deliver valuable related information of relevance to the application of the Convention.

The Conference of the Contracting Parties

11. URGES all Contracting Parties yet to complete comprehensive national inventories of their wetland resources, including, where possible, wetland losses and wetlands with potential for restoration (Resolution VII.17), to give highest priority in the next triennium to the compilation of comprehensive national inventories, in order for related actions such as policy development and Ramsar site designations to be carried out with the best information possible;
12. FURTHER URGES that in undertaking inventory activities Contracting Parties give consideration to affording highest priority to those wetland types identified as at greatest risk or with poorest information in the *Global review of wetland resources and priorities for wetland inventory* report;
13. REQUESTS Contracting Parties to give consideration in their inventory activities to adopting a suitable standardised protocol for data gathering and handling, such as that provided by the Mediterranean Wetlands Initiative (MedWet), and the use of standardised low-cost and user-friendly Geographic Information System methods;
14. ENCOURAGES Contracting Parties with shared wetlands or river basins to work cooperatively in the gathering of inventory and related management information, as urged through the *Guidelines for international cooperation under the Ramsar Convention* (Resolution VII.19);
15. REQUESTS the Scientific and Technical Review Panel, in collaboration with Wetlands International, the Ramsar Bureau, and other interested organisations, to review and further develop existing models for wetland inventory and data management, including the use of remote sensing and low-cost and user-friendly geographic information systems, and to report their findings to the 8th Meeting of the Contracting Parties with a view to promoting international common standards;
16. CALLS UPON Contracting Parties to review the arrangements they have in place for housing and maintaining their wetland inventory data where it exists, and, as necessary, to seek to establish a central repository or to ensure that access to this information resource is possible for all decision-makers, stakeholders and other interested parties, where possible through the World Wide Web and CD-ROM formats;
17. ALSO ENCOURAGES Contracting Parties and other interested organisations and funding bodies to provide the resources to allow Wetlands International to complete and document suitable standardised protocols for data gathering and handling as well as a comprehensive assessment of wetland inventory information, and to develop procedures for regularly updating this information and making it readily available through the World Wide Web and CD-ROM formats;
18. FURTHER CALLS UPON the bilateral and multilateral donors to give priority to supporting the wetland inventory projects submitted by developing countries and those in economic transition, noting, as urged above, the desirability of such projects being undertaken; and
19. DIRECTS the Standing Committee to give special attention to appropriate wetland inventory projects in its consideration of projects submitted to the Ramsar Small Grants Fund.