

## **Conclusion of Working Group 4:**

# **ECOLOGICAL CHANGE - CONCEPT & APPLICATION: DEFINING GAPS AND PRIORITIES**

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This group took a very broad perspective and concentrated upon generic issues of monitoring objectives, design of monitoring programmes and monitoring techniques. Specific details or problems of particular habitat types were purposefully not discussed. Such an approach was adopted in view of the recognition of the broad problems, often at a conceptual level, of establishing effective monitoring programmes for the provision of management information. Discussion also centred on the usefulness of the **Ramsar Convention** as a vehicle for conserving wetlands and for encouraging national governments to establish effective monitoring programmes. Thus, the following summary is of a generic nature and is seen as a preliminary step in the development of programmes and individual techniques for assessing the extent of ecological change at all wetlands, not just those listed as internationally important.

## **THE NEED TO MONITOR WETLANDS**

At an international level wetlands are recognised as being important under the criteria developed through the Ramsar Convention. Contracting Parties to the Convention list internationally important wetlands; however, there is no independent vetting of the listed wetlands to determine whether they fully meet the criteria for listing, or to ascertain that once listed, their ecological

character and value is maintained. Vetting may be seen as a desirable process, but it has not been accepted as an integral part of the Convention because of concerns over national sovereignty. Despite this shortcoming in the listing process, the Convention does require (under Article 3.2) Contracting Parties to maintain the basic ecological character of listed wetlands and if the site has changed, is changing or is likely to change, then this must be addressed. This is potentially a powerful tool to encourage monitoring and the maintenance of the ecological character of a listed wetland. In practice, however, this potential is not fully realised as decisions on the significance of actual or likely change are the prerogative of the Contracting Party.

The Ramsar Convention does recognise that changes in ecological character need to be addressed and in some cases remedial action taken. Unfortunately, there are no technical guidelines for doing this. Such guidelines are needed and should be firm and precise and form the basis of statistically valid and rigorous monitoring programmes that not only address the extent of change, but also the significance of the change. The current Ramsar Monitoring Procedure is more of a diplomatic appraisal exercise and cannot pass for a truly thorough and independent assessment of the state of the wetland being monitored. Furthermore, the monitoring can only be undertaken with the express permission of

the Contracting Party concerned. Thus, despite international designation, it is not possible to effectively and independently monitor the status of recognised important wetlands.

Listing of wetlands under the Ramsar Convention obliges the Contracting Party to address the issue of ecological change at all wetlands and not only those listed as internationally important. This is an important obligation, but there is little real indication that this is being done. Past effort seems to have been directed almost entirely at listed sites, to the possible detriment of non-listed sites. Monitoring is required if these sites, many of them identified as being of international importance in international wetland inventories, are to be maintained and their natural values sustained. Monitoring at a technical and statistically valid level against an agreed and predetermined baseline is required for all wetlands and not just those inscribed on the Ramsar list.

## **DESIGN OF MONITORING PROGRAMMES**

The listing of a site under the Ramsar Convention implies that there is a contract to maintain the ecological character of that site. This could be done by using the criteria for listing the site as a baseline, augmented by a common data sheet that includes a succinct description of a basic set of parameters that could form the basis of a monitoring programme. These parameters should emphasise the water regime (including qualitative and quantitative aspects), the biological characterisation and the main physico-chemical factors that affect these, and the current and expected human uses and management processes (incorporating potential improvements and restoration requirements).

The information on the common data sheets should provide the broad baseline

against which changes in ecological character can be compared. This is the starting point for designing a monitoring programme, identifying the all important objectives and establishing hypotheses to be addressed. The information on the data sheets needs to be based on thorough ecological assessments and supported by statistical assessments of the extent of seasonal and annual variation. These data sheets need to be regularly updated and available for public scrutiny.

Monitoring techniques were identified at different phases of the underlying socio-economic processes that often lead to change in ecological character of wetlands. Firstly, at the policy/planning phase, monitoring should address the development of socio-economic policies, the efficacy of the environmental impact assessment process, the allocation of budgets within state and local authorities (e.g. for agricultural drainage) and the design of land/water authority work programmes. Secondly, at the implementation phase, on-site monitoring of cause and effect is required with attention to development activities (e.g. digging of drainage canals, etc.), specific environmental parameters and indicators of change. Thirdly, at the post-implementation phase, continued monitoring of the effects of development activities and the effectiveness of the monitoring programmes in the earlier phases is required to identify necessary counter measures or mitigation steps.

Problems encountered in developing effective monitoring programmes are often most acute at the early phase of assessing policy and budget allocations. Whilst little specific training may be needed for such monitoring great difficulties can be encountered in obtaining access to relevant information in a systematic and timely manner. Such monitoring is outside the technical aspects so often considered in environmental monitoring programmes.

However, it is at this first phase that decisions are made that will affect the ecological status of wetlands, often for years to come. It is essential, therefore, that steps to obtain relevant and timely information are developed. At one level, contact and access to political figures could assist, whilst at another, changes in the political process to allow effective access to information through freedom of information legislation are needed.

Effective monitoring of the underlying economic and other factors that detrimentally affect wetlands often suffers from a lack of sufficient staff. NGOs all too regularly carry out such tasks without having access to adequate staff or financial resources. Similarly, government agencies with watchdog roles are often seen as being under-resourced or limited by restrictive legislation. Unless these resource problems are resolved monitoring at all phases of development could prove extremely difficult. Under a scenario of scarce resources, the most effective monitoring approach will most likely be at the policy/planning phase - which is the antithesis of many current programmes.

On-site monitoring of ecological change and its apparent causes should also be expanded. In doing this, effort should be made to maximise the advantages from current surveys etc. (e.g. add effective analyses of habitat change to the international waterfowl census surveys) rather than simply opt for entirely new programmes. Most importantly, the information from such surveys should be transferred as quickly as possible to the most relevant local and state authorities whether or not they actually participate in the surveys.

## MONITORING TECHNIQUES

Monitoring programmes should address both specific sites and the broader land-  
scape level of wetland conservation.

Thus, they need to be based on the results of national and international wetland inventories. The inventory databases need to be compatible with other data sources and also regularly updated. In fact, the updating of the database should be an integral component of the monitoring programme. Planning for further inventories or updating of past inventories should not be done without incorporating steps to ensure the information is readily accessible and available through standardised data formatting and storage systems.

Monitoring of wetland sites should primarily be a technical exercise, but needs to take account of the type of wetland and site specific aspects (e.g. local values and regional representativeness). Whilst an overall wetland monitoring programme with broad conservation objectives at a landscape level may be desired it is also necessary to establish monitoring objectives for individual wetlands. When monitoring, it is necessary to take into account the best available baseline information and to initiate steps to expand this if it is not sufficiently rigorous, hence the need to enhance baseline data sets through well considered inventories.

Inventories are not only a necessary prerequisite for monitoring but are also ongoing in their own right. As inventories can offer different levels of detail and data collection it may be useful to adopt a phased approach to collecting information:

- collation of existing information;
- collection of further information covering site characteristics and values, land uses and disturbances, in situ and ex situ threats, and proposed conservation measures; and
- collection of more detailed information primarily in relation to mapping and data storage needs and including relating spatial information in a GIS format.

The key issue in compiling the inventory is the usefulness of the data for management (which includes monitoring) purposes. The information contained within the inventory should be considered as the first result that provides the spring-board for setting the objectives for the effective monitoring of change in ecological character.

The significance of the extent of ecological change first has to be based on a comparison with a valid baseline, then assessed (and reassessed at regular intervals) in terms of the value of the site at a local and regional level. An expert evaluation of the significance of the change needs to be based on the best available conservation knowledge, and gaps in information and understanding of ecological processes identified. After such an evaluation, management strategies that take into account the underlying economic, social and political causes need to be formulated. Unless the management strategies take into account the basic underlying causes of the change in ecological character, there is little likelihood of effective remediation once change has been detected.

Monitoring of ecological change should address the apparent environmental causes in unison with the underlying economic, social and political causes. The data collected from a monitoring programme should not only be objective, but also available within realistic time frames for management options to be canvassed and explored. Early warning techniques for ecological change should be coupled with reviews and assessments of economic and political decisions.

Techniques that enable early warning of likely change in ecological character include the following: species inventories and community dynamics; ecotoxicity of a broad spectrum of organisms; rapid assessment and screening of key parameters; bioindicators; biological assessment of

genetic, biochemical, physiological, immunological etc. processes; and remote sensing correlated with key ecological parameters. These techniques all have different applications and strengths for temporal and spatial monitoring and need to be applied after careful consideration of the monitoring objectives (i.e. the objectives are agreed before the technique is chosen).

## **ADMINISTRATION AND INTERNATIONAL COORDINATION**

Monitoring of listed Ramsar sites is the responsibility of national governments with reports on ecological status being submitted to the triennial meetings of the Contracting Parties to the Convention. The Bureau of the Convention may conduct a monitoring procedure at a specific site with the agreement of the national government concerned. However, the Ramsar procedure, whilst called a monitoring procedure, is far from being a thorough technical assessment of the site concerned. Rather, it is a cooperative mission designed to assist in the development of effective management procedures. Other international conservation organisations also provide comment on specific sites, but there is no overall nor ongoing assessment of the condition of wetlands at an international level. Some information is available from the IWRB-coordinated international waterfowl census and the various international wetland inventories.

Training for wetland monitoring is now a well recognised need and efforts have been initiated by IWRB to fill part of the current gap. Training at a regional and local level is required in the following areas: lobbying and advocacy to influence policy development; policy assessment and appraisal; integration and interpretation of data including the use of statistics; and the development of manuals suitable for field staff

charged with monitoring and data interpretation. This effort needs to be extended beyond the very technical emphasis currently adopted by IWRB.

International and regional organisations could well play a valuable role in coordinating demonstrations of the application of effective monitoring techniques and programmes. Such demonstrations should not only concentrate on techniques, but also show the importance and value of carefully planned and executed monitoring programmes for management purposes.

Throughout Middle Europe ecological change in wetlands is occurring primarily as a result of drainage, eutrophication and pollution, inappropriate forestry (deforestation and afforestation) and agricultural management, and canalisation (increased discharge rates). These problems are important at both national and regional levels, with many spilling across sovereign borders; in this context, international coordination should be expanded and strengthened. However, it is recognised that current attempts to address such issues have not been overly effective, partly as a consequence of concerns over national sovereignty. Monitoring of habitat changes at an international level in Middle Europe will require a carefully executed diplomatic component under current political conditions.

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# ZOBODAT - [www.zobodat.at](http://www.zobodat.at)

Zoologisch-Botanische Datenbank/Zoological-Botanical Database

Digitale Literatur/Digital Literature

Zeitschrift/Journal: [Stapfia](#)

Jahr/Year: 1994

Band/Volume: [0031](#)

Autor(en)/Author(s): Finlayson C. Max

Artikel/Article: [Conclusion of Working Group 4: Ecological Change + Concept & Application: Defining Gaps and Priorities 157-161](#)