

Conclusion of Working Group 3:

MONITORING RIVERS AND FLOODPLAINS

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WHY MONITOR?

The discussion focused at first on general objectives of monitoring programmes for floodplain rivers, namely the assessment of:

- their status quo and extent of natural variability (background monitoring, surveillance monitoring),
- effects of man-made perturbations,
- responses to management impacts.

We agreed that the analysis of the natural, system-characteristic variability is problematic, since all major European river systems have been strongly changed, and many riparian wetlands are still continuously changing, due to historic engineering programmes (river regulation schemes starting in the last century). In this context, the analysis of ecological responses to management programmes or to engineering activities becomes more and more important.

The specific aims of a monitoring programme will be orientated:

- to analyze the functioning of alluvial systems, or
- to define the conservation value (conservation potential, extent of human alterations, habitat requirements of characteristic species), or
- to analyze aspects of resource use (e.g. drinking water supply, self-purification processes), or
- to consider general effects of changes in the drainage basin (e.g. deforestation) on riparian wetlands.

WHAT TO MONITOR?

Appropriate monitoring indicators have to be derived from a basic understanding of the functioning of floodplain ecosystems. The main concepts concerning riparian ecosystems are the "flood pulse concept" and the "hydrological connectivity concept" (see Schiemer, this volume).

We listed the following elements as being specifically relevant to the ecological monitoring of floodplains:

- General landscape characteristics
 - climate
 - geology
 - etc.
- Structure
 - geomorphology
 - patch structure
 - ecotones (pattern, packing)
 - habitat connectivity
 - community structure
- Functions
 - patch dynamics
 - hydrological connectivity
 - processes (nutrients, P/R, sediments)
 - community and population dynamics
- Human impacts
 - hydraulic engineering
 - land use
 - pollution

DESIGNING MONITORING PROGRAMMES

In discussing appropriate indicators, there was general agreement that due to the complexity of floodplain systems it is im-

possible to recommend a fixed scheme of parameters at the present time.

Instead it appears necessary for the planning of monitoring programmes to take an **interdisciplinary approach** including ecologists and hydrologists.

Whilst planning a monitoring programme, it is of great importance to clearly **define its aim and spatial scale**.

It is advisable to **execute pilot programmes**: such preliminary surveys are required to select appropriate integrative indicators and to determine monitoring logistics. Efficient indicator systems should:

- provide a good integrative view of the ecological situation
- reduce redundancy (e.g. vegetation vs hydrology)
- respect the financial and human resources available.

The required indicator system has to combine physiographic ("bottom up") and biotic (integrative, "top down") parameters. "Efficient" i.e. non-redundant indicator schemes call for research on the eco-physiology of characteristic species, both plants and animals, and on the causes of observed patterns in species distribution and community structure in space and time. This requires both a field-based ecological and an experimental approach. The existing experience on floodplain ecology already suggests a number of parameters, which are particularly indicative, e.g. ground-water exchange, sediment accumulation, development of macrophytes, structure of fish communities, etc..

Further research will improve the indicator value of such parameters and enlarge the indicator range.

In conclusion we agreed on the necessity to develop standardized methods and criteria for floodplain evaluation in Europe.

This standardization should include:

- the structuring of programmes according to aims and spatial scale
- the selection of common indicators
- the sampling and analyzing programme (including quality assurance control)
- the compatibility of data evaluation.

In order to develop such a standardisation process, both an initiative and a carrier is required. We suggest that IUCN could function as the carrier.

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