

**Conclusions and recommendations**  
**4th International River Restoration Conference**  
**Venice, San Servolo Island, 15-21 June 2008**

**Introduction**

This summary paper on conclusions & recommendations of the 4<sup>th</sup> International Conference on River Restoration aims at identifying the key issues for river restoration for the near future, as they were noted during key note presentations and workshops. Individual sections elaborate in statements on the state-of-the-art in river restoration today and the key aspects for the future, and on the interaction between the EU and river restoration. The paper concludes with an elaboration on the envisioned role of the ECRR and its activities in contributing towards preparing river restoration for the future

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**State-of-the-art in river restoration**

From the multitude of abstracts read and presentations heard, past and present features of river restoration practices can be characterized in an number of statements:

- Often the term “river restoration” does not concern with ecological restoration, the terminology of river restoration is misused for other purposes;
- River restoration is more research oriented instead of focusing on the practical implementation;
- Predominantly river restoration is tackled on a small-scale, focusing on the river, more rarely on (part of) the floodplain, while hardly ever on the river basin. It is often unsure whether local restoration efforts tackle the impact of relevant larger-scale regional factors on the right location;
- Only occasionally clear descriptions of reference situation are used to elaborate or define envisioned future ecological “wish” conditions to be aimed for after completion of river restoration activities;
- Rarely objectives to produce targetable and measurable outcomes for river restoration are defined in advance;
- Often the broad possibilities featured by river restoration meet with entrenched practices and mind-setting: commonly implementation of river restoration is dominated by engineering towards modifying hydro-morphological processes;
- Increasingly river restoration faces a policy delivery gap: growing organizational complexity, tighter procedures and control enforced by government authorities and funding agencies oppose the need for divergent risk strategies;
- During the latest decades new policy drivers linking to river restoration surface, e.g. risk management, flood safety;
- In implementing river restoration, predominantly an explanation is given of selected species development instead of an interpretation whether or not movement in the “right”, predefined, integrated ecological objectives. In this, descriptions of local changes prevail, commonly supported by statistical analysis “before” and “after” intervention;

## **River restoration ready for the future**

The presentations and discussions of the conference participants however also demonstrated that as a result of the expansion of river restoration projects being implemented during the last 10-15 years, an increased learning from practice can be observed. There is a progressively growing awareness and knowledge among stakeholders of the need to use new approaches. More and more national policies become available and/or are under implementation, while there is more attention for the regional differences within Europe. Last but not least, there is an increased awareness and understanding of opportunities and benefits related with river restoration among the various stakeholder levels. More specifically, a number of more specific observations on the future to river restoration are formulated:

- River restoration should target at restoring complete ecosystems and ecosystem processes, in which, as in undisturbed nature, dynamism is a key feature, expressed as the self-sustaining capacity of river and stream ecosystems and their capacity to respond to imposed external environmental changes. In this, hydro-morphological processes remain a key factor in steering ecosystem processes and ecosystem quality;
- Uncertainty is inherent in ecosystem processes, guided by changing environmental conditions and human activities. On the one hand the capability to predict the effects of interventions needs to be improved, but on the other hand the understanding and level of acceptance of uncertainty in restored ecosystem processes as well;
- A pre-intervention, preferably quantified, definition of ecological success criteria is necessary to assess the success level of river restoration;
- In defining ecological success criteria, historic standards may be largely inappropriate due to the need to take external changes into account (climate change, human population growth, land use changes, economic developments, etc.). Therefore, design rivers for the future with respect for the past, with the understanding that only selected services can be realistically restored;
- River restoration should aim at tackling or contributing to solving regional impact factors, from the river to the basin via the floodplain. Key targets in these are restoring of lateral and longitudinal connectivity, both aquatic and terrestrial;
- River restoration remains to be based on scientific processes and predictions to anticipate outcomes and guide design. Meanwhile, research should shift more towards supporting practical on-the-ground implementation;
- With increasing scale, river restoration should be based on multidisciplinary, adaptive management approaches and the acceptance of non-stationarity. With increased scale, public involvement in planning, monitoring & appraisal, social processes and interactions between stakeholders are increasingly important. Engaging the range of stakeholders in decision-making processes and most specifically the 'public' in all its diversity is the major challenge. A better analysis of the possible conflicts and synergies between ecological and social functions of river restoration projects allows a better understanding of the needs of nature and the use of people;
- In planning and assessment, river restoration should use approaches including multi-criteria analysis, cost benefit analysis, economic evaluation. This requires also the elaboration of pre-interference restoration appraisal plans, as well as adequate (long-term) multi-level monitoring, including the monitoring of restored processes and distinguishing effects from natural variability from intervention impact. Monitoring could vary from in-depth scientific monitoring at a few selected sites, to expert opinion and small scale local stakeholder monitoring.

## **River restoration and the EU**

The embedding of river restoration into an appropriate policy context is crucial to decision-making processes and implementation practices towards reaching defined results. In western Europe, policy such as the WFD has been an effective driver although slow to make its effect felt. In other regions (e.g. Eastern Europe, Latin America) policy exists but government is weak or failing; here the roles of academic institutions and civil society to act as an 'honest broker' to support policy implementation are critical. In most cases there is a gap between policy development and practice, in which learning processes linking the two are lacking.

Commonly agreement exists, both within EU authorities and ECRR delegates, that on the one hand river restoration practices are being supportive to the implementation of various EU Directives, while on the other hand the implementation obligations under the EU Directives often are a driving force for the implementation of river restoration projects. The sustainable maintenance of biodiversity is especially the objective of the combined implementation of the Water Framework Directive (WFD) and the Bird & Habitat Directives (BHD), especially in Natura-2000 sites. Implementation of the WFD deals strongly with the reduction of nutrients and micro pollutants, while river restoration is based on an integrated ecosystem development approach. This difference creates obvious good opportunities, but also some threats with respect to an effective joined implementation of both river restoration measures and the EU directives.

Although there is a common understanding that river restoration is more than an instrument to implement EU Directives' obligations, river restoration practices can contribute to creating habitats (Habitat, Bird Directives, Natura 2000), reduction of flooding (Flood Risk ...), pollution abatement. The EU and related national implementation programmes can therefore be targeted to finance river restoration, especially when river restoration targets are formulated in line with programmes on flood defence, water quality improvement, the Common Agricultural Programme, ecological networks, etc. The ECRR in this could assist EU member states in implementing EU Directives using river restoration where it is the most cost-effective instrument to obtain good ecological quality.

However, questions remain, mainly dealing with river restoration in relation to river basin management, variability in ecological and physio-chemical targets, the protection of wetlands in relation to water quality and quantity status, the position of saturated and unsaturated groundwater zones, and the contribution of restored sites to the environmental cost recovery. Also unclear is how river restoration can best formally be included into the programs of measures under EU directives. While EU directives have a strong legislative basis, there is quite some flexibility possible in the implementation of river restoration measures.

## **The ECRR**

The European Centre for River Restoration is an excellent platform providing both scientists, project managers and decision-takers with the opportunity for a regular refocusing of actual practices and outlook into future human developments and their impact on river restoration.

The network function of the ECRR translates into several proposed strategic fields of activities for the ECRR:

- **Policy support:** The ECRR should be the supportive link between the EU and the professionals who have to apply the WFD and related directives. The ECRR should collect questions and problems from the different member states of the EU and should reflect on these in reports to the EU, proving the achievements of the EU Directives' goals in the light of socio-economic benefits they can provide to the society (economic evaluation as a pillar to prove the goodness of river restoration). More wider the ECRR should also disseminate information on good experiences with river restoration (projects) as a possible solution to these problems, including the communication of common policy vision at international and national platforms like the EU, the 5<sup>th</sup> World Water Forum etc.
- **Cooperation:** the ECRR has a key role in providing support to strengthening the national and international networks. One way to do so is by expanding the number of official cooperation agreements with trans-national and national organizations. The ECRR should aim for more and stronger cooperation with NGOs, to assure better project implementation through commitment of local communities and stakeholders towards river, wetland and floodplain restoration.
- **Information:** Conference participants generally agreed on the need for a best practices database and toolkit on river restoration & river management techniques, based on commonly accepted guidelines as to what can be considered as best practice and expert assessment of selected projects. The database & toolkit should be structured in accordance with the different fields of application, with both scientific and non-scientific evidence included and accessible in various ways. Improved communication at several levels of difficulty aims at targeting researchers, policy makers, practitioners and the public alike. Instruments available include an improved newsletter a distant e-learning course on techniques & best practices on river restoration, regional seminars, international conferences, publication of proceedings, etc. The ECRR intends to target EU funding to further elaborate this strategic field of activities.
- **Communication:** Strategic objective for the ECRR is to promote the translation from research oriented local river restoration activities to the elaboration and implementation of integrated larger-scale practical activities. As such, ECRR activities aim at increasing the knowledge base and common understanding of expectations among scientists, practitioners and decision-takers at the European level by means of publications, website conferences, all tailor-made based on the recognition of the various stakeholder groups – technical disciplines, policy makers, decision makers, practitioners, funders, etc. The ECRR should emphasis the link between the strategic and operational levels, by improving the knowledge base of decision takers (awareness raising) and improving the understanding of scientists and practitioners on relevance and complexity at the policy level. It also provides scientists and practitioners with opportunities to exchange experiences and best practices. In name of its members, the ECRR serves as a representative to international and national platforms like the national governments and the EU, at international conferences, river basin commissions, the World Water Forum, etc., where the common view on river restoration can be expressed.

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