

Recommendations of the meeting of the European Platform for Biodiversity Research Strategy

held under the Slovenian Presidency of the EU
Brdo, Slovenia, 15th -18th January 2008

concerning

WATER FOR LIFE: RESEARCH PRIORITIES FOR SUSTAINING FRESHWATER BIODIVERSITY

Research plays an essential role in designing and implementing policies relevant to biodiversity and water issues¹.

Having in mind the unique and vulnerable nature of freshwater ecosystems, the high stresses put on them, the threats they face, and their importance of the ecosystem services that they provide and their contribution to human well-being, the participants of the meeting place high priority on interdisciplinary research in a catchment context to:

1. improve the characterisation and assessment of the diversity and distribution patterns of ecologically important freshwater taxa;
2. assess the status and distribution of poorly known or vulnerable freshwater ecosystems and habitats;
3. improve understanding of the ecology, conservation and sustainable use of organisms with a lifecycle that involves both freshwater and terrestrial or marine stages;
4. improve understanding of the functioning and role of surface and subsurface freshwater biodiversity for the provision of ecosystem goods and services and develop policy-relevant indicators;
5. analyse the significance of temporary pools and temporary and permanent headwater streams for biodiversity, ground water recharge, stream morphology, flow regime, nutrient and sediment content in downstream reaches;
6. better understand and quantify how the combination of multiple human and natural drivers at various spatial and temporal scales impact on freshwater ecosystems, biodiversity, ecosystem services, functions, and resilience;
7. better understand and quantify the effect of composition, configuration, connectivity and temporal dynamics of freshwater systems on biodiversity, ecosystem services, functions, and resilience;
8. better understand and quantify the impacts of mitigation and adaptation measures for climate change (such as hydropower, bio-fuel production, flood defence infrastructure) and for other aspects of global change on freshwater biodiversity, ecosystem services, functions, and resilience;

¹ Freshwater and its biodiversity impact on, or are affected by, many policy areas at all levels of governance. At the EU level, key policies include the Nature (Habitats and Birds) and Water Directives (Directives 92/43/EEC, 79/409/EEC and 2000/60/EC, respectively), and other legislation such as energy (COM(2007) 1 final), agriculture (COM(1999) 22 final), transportation, and biofuels (COM(2006) 34 final).

9. identify and characterise the role of refugia in maintaining the long-term adaptive and evolutionary capacities of freshwater biodiversity;
10. further develop tools to effectively conserve and sustainably use freshwater systems, taking into account their specific characteristics such as spatial and temporal dynamics and connectivity;
11. further develop tools to evaluate the ecological, social, and economic effectiveness of rehabilitation measures, and to better design and prioritise these measures;
12. harmonise and further develop criteria to assess environmental flow to better protect aquatic and riparian ecosystems and to provide long-term ecological services;
13. evaluate the effects of the Water Framework Directive and other relevant EU legislation on freshwater biodiversity, and to analyse how to integrate elements of those policies – and to fill policy gaps – for more effective conservation and sustainable use of freshwater ecosystems.

To develop the necessary high quality and policy relevant research on freshwater biodiversity, particular attention should be paid to:

- long-term monitoring and assessment, without which predictive models are difficult or impossible to construct, calibrate and validate;
- integrating, and making accessible, interactive databases on freshwater species and their distributions, including paleo-limnological records;
- ensuring that, where appropriate, data collection and archiving are properly integrated in the Global Earth Observation System of Systems;
- building and maintaining national expertise and capacity in morphological and molecular taxonomy and systematics;
- maintaining and improving communication and close collaboration between scientists and managers of freshwater systems and watersheds.

These research priorities were derived from the following key considerations.

Freshwater ecosystems:

- are highly diverse, both above and below ground. They occupy a wide variety of waterbody types – temporary and permanent, large and small, stationary and flowing, intermittent (karstic) and continuous. They range from pore waters, springs and headwaters to rivers, lakes, wetlands and estuaries. They also include transitional systems that link freshwater with terrestrial and marine environments;
- provide crucial goods and services (outlined, for example, in the Millennium Ecosystem Assessment), and, in particular, strongly influence water quality;
- lie at the lowest points in topographies, where they gather, focus and integrate multiple pressures from entire catchments;
- are often patchy, or linear, and frequently have high border to area ratios;
- are a crucial component of landscapes, often critically linked to the welfare of terrestrial and marine ecosystems;
- are highly dynamic: rapid changes in both space and time occur in the biological, hydrological, chemical and physical properties of these systems.