Conference Volume	5th Symposium for Research in Protected Areas 10 to 12 June 2013, Mittersill	pages 315 - 316

What are currently the most relevant research priorities, research questions, methods and recent results regional and supra-regional, short and long term?

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Abstract

Traditionally, conservation efforts as well as research have mostly addressed single, rare or endangered species. The focus of these one-sided approaches has been broadened. It has been recognized that an ecosystem level perspective has to be applied and that we must go beyond the conservation of attractive flagship species to establish a network of protected areas representing the full variety of species or ecosystems. Priority in conservation literature is today dedicated to the assessment of conservation value and protection in the form of comprehensive, adequate and representative network of conservation areas and the identification of threatening processes and protection against these.

Additionally, increasing attention must be given to future scenarios, i.e. those driven by climate change, demographic development etc. This is the only approach that can successfully integrate issues of the vulnerability of ecosystems and that can support policies to protect habitats, refuges and migration corridors of species under current and future conditions. Further developed methods have to address these questions.

Particularly, in case of freshwater conservation strategies it is crucial to take into account ecological, hydrological and biogeochemical processes that are relevant for preserving the abiotic conditions and the flora and fauna of the respective ecosystem (VERHOEVEN et al. 2008). Freshwater conservation is a complex issue due to the status of rivers and floodplains as receivers of land use effects. Protecting a particular component of the biota and habitat requires controlling upstream river sections and catchments, the surrounding land, and, concerning migrating aquatic fauna, downstream reaches (DUNGEON et al. 2006). Accordingly, beyond the traditional criteria that represent 'rarity' or 'naturalness', adequate criteria must be identified and applied to capture freshwater dynamics, processes and threats (process-oriented criteria).

A crucial aspect not only for freshwater conservation strategies is to consider the different spatial scales of the ecological, hydrological and biogeochemical processes that are relevant to preserving the abiotic conditions and the flora and fauna of the ecosystems (VERHOEVEN et al. 2008).Ecological theory suggests that conservation at large scale is preferable.

Setting goals is an additional important issue, intended to address the question of 'how much protection is needed/ is enough?' The principle of conservation efficiency needs to be investigated to provide guidelines for optimizing the economy of space, i.e. that conservation targets in a management plan are met with minimum area (ROUX et al. 2008).

Future approaches have to take into account the specific needs of different ecosystem types, based on ongoing research on requirements and thresholds for the maintenance of these types.

The urgent demand of monitoring the effects – in terms of success or failure - of new approaches in protection research is emphasized also in the following chapter ("Long term ecosystem research")

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