Part II: Workshop Presentations

2.3 A tiered approach to develop indicator systems for biodiversity conservation

by Ulrich Sukopp

Comprehensive data on the state and changes of nature and landscape provide fundamental information for planning and decision-making in modern conservation policy. In recent years, much effort has been spent to improve communication of monitoring results particularly towards politicians and the public. For this purpose, many different biodiversity indicators and indicator systems have been developed. The main objective of monitoring programmes is to produce precise and reliable information on the state and trends of different aspects of biodiversity. Indicator reports based on sound indicator systems are then used to make monitoring results known not only to experts but also to decision-makers and the public. Such indicators need to reduce complex biological information to simple and easily understandable messages of political concern (Dröschmeister/ Sukopp 2009).

This presentation defines the terms 'monitoring' and 'indicator' in the context of nature conservation as follows: Monitoring comprises empirical records (observations, counts and measurements) of selected elements of communities, habitats and landscapes in regular long-term spatiotemporal sequences which are designed to achieve with standardized scientific methods reliable results on the state and changes of these elements and which are directed to nature conservation and environmental protection objectives (after Sukopp et al. 1986, Dröschmeister 1996, Sukopp/Weddeling 2007). Indicators in environmental sciences and nature conservation summarize empirical data from monitoring programmes in order to depict driving forces, pressures, states, impacts or societal responses related to biodiversity in an easily understandable manner. Indicator results can be used to control the achievement of previously agreed conservation objectives and should provide policy advice. Such indicators are different from strictly scientific indicators (cf. Turnhout et al. 2007). The common classification of biodiversity indicators into driving forces, pressure, state, impact and response indicators (DPSIR model) is explained. Remarks on how to improve the consistency of both definitions complete this part of the presentation.

In order to develop biodiversity indicator systems, a tiered approach is presented which comprises the following steps: selection of monitoring parameters and monitoring sites, implementation of monitoring programmes, compilation of relevant monitoring data, development of suitable indicators, determination of conservation objectives, communication of indicator results and provision of policy advice. Theoretically, this approach can either be used by starting at the top end or at the bottom end of the mentioned sequence. For practical reasons, a mixture of both ways is usually employed.

Two examples of indicator sets are presented: (1) EEA (2007) published an initial set of biodiversity indicators available at EU and pan-European levels. This set resulted from the first phase (2005-2007) of the Streamlining European Biodiversity Indicators by 2010 (SEBI 2010) project on the development of indicators to assess progress towards, and help achieve the European target to halt the loss of biodiversity by 2010. At present, the set is made up of 26 indicators assigned to 7 focal areas. (2) In November 2007, the National Strategy on Biological Diversity was adopted by the German Federal Cabinet (BMU 2007). It lists about 330 environmental quality targets and action objectives as well as about 430 specific measures. A set of currently 19 indicators has been selected to estimate how successfully the strategy objectives will be met in the future (cf. Sukopp et al. 2008). Implementation of measures and achievement of targets will be reviewed in a summarizing manner

at regular intervals. The indicator set of the strategy is shown in detail.

Finally, the German Sustainability Indicator for Species Diversity (SISD) is presented as an example of an indicator fulfilling the most important standards and requirements for a sound biodiversity indicator (cf. Sukopp et al. 2007). It is the leading national nature conservation indicator based on living organisms. SISD summarizes the trends in abundance of 59 representative bird species. The issue of sustainability and nature conservation objectives become part of the indicator construction by defining target values: an expert panel has determined a target value for each species, which should be attained until 2015, provided that the guidelines for sustainable development and the legislation on nature conservation will be fully implemented in Germany. The indicator results are shown in detail.

At the end of the presentation, main conclusions are summarized.

KEY LITERATURE

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BACKGROUND AND TASKS

Ulrich Sukopp studied at the Faculty of Biology of the Free University Berlin with a particular focus on botany and ecology. He graduated with the Diploma in Biology. In the 1990s, he did research on the flora and vegetation of Southern Jordan at the Botanical Garden and Botanical Museum Berlin-Dahlem. On the basis of the scientific results of these studies, Ulrich Sukopp obtained a PhD (Dr. rer. nat.) at the Chair of Biogeography of the University of Bayreuth. Between 1990 and 2003, the author was employed as a scientific researcher and assistant lecturer at the Institute of Ecology of the Technical University Berlin, at the Science Centre Berlin, at the Botanical Garden and Botanical Museum Berlin-Dahlem and at the Chair of Biogeography of the University of Bayreuth.

Since 2004, Ulrich Sukopp is employed at the division I 1.3 of the German Federal Agency for Nature Conservation (Bundesamt für Naturschutz) dealing with biodiversity monitoring and indicators on a national level. Since 2007, he works also as an assistant lecturer at the Institute of Geography of the Friedrich-Wilhelms-University Bonn. His main current research areas cover monitoring of nature and landscape, development and reporting of nature conservation indicators, the flora and vegetation of Central Europe and the ecological assessment of the deliberate release of genetically engineered crops.