

Adapting conservation management to climate change – Challenges and solutions from protected areas in Central Europe

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Abstract

The EU-funded project HABIT-CHANGE studied opportunities to adapt conservation management to climate change. HABIT-CHANGE brought together conservation managers from Central European National Parks, Biosphere Reserves and Nature Parks with conservation agencies and research institutions. This unique science-practice partnership jointly analysed existing management approaches, and the potential impacts of climate change and adaptation options for management. A main result of the project is a tested framework for the development of Climate Change Adapted Management Plans. The framework provides support for identifying adaptation strategies and measures at site level. Important results are practice oriented guidelines to support effective awareness raising and stakeholder involvement and guidelines for the development of Climate Change Adapted Management Plans.

In this paper we present major outcomes of the project and discuss existing obstacles that constrain climate adaptation of the management in protected areas.

Keywords

Climate adaptation, conservation management, adaptation process, protected areas, habitat conservation, stakeholder involvement

Introduction

The current discussion about climate change is often focused on reducing or capturing greenhouse gas emissions. Mitigation is of utmost significance; however, the management of Europe's natural capital and heritage needs also to be adapted to the effects of climate change. Climate change has already noticeable impacts on biodiversity (PARMESAN et al. 1999; ROOT et al. 2003). The timing of seasonal events like first flowering date of plants and breeding dates of birds have advanced as spring is taking place earlier in the year (CRICK et al. 1997). Species are changing their geographic distribution northwards or to higher altitudes. In consequence, established ecological interactions like hatching of offspring and availability of food sources are disrupted in time or in space. Altered water regimes are likely to change character of habitats and ecosystems. Projected climate trends are expected to intensify overall biodiversity loss (CARVALHO et al. 2010, CHEN et al. 2011; MCLAUGHLIN et al. 2002). Handling these changes by adapting to them is a challenge for conservation management, from international to local level.

The EU-funded project HABIT-CHANGE developed and tested an adaptation approach for protected areas that allows effective, adaptive management in times of climate change. The acronym HABIT-CHANGE not only stands for the expected habitat changes caused by climate change and land use but also for the necessary adaptation of our own habits in close connection to this. HABIT-CHANGE is a unique science-practice partnership that brought together conservation managers from Central European National Parks, Biosphere Reserves and Nature Parks with conservation agencies and research institutions. Existing management strategies, trends in climate change and potential impacts on protected habitats and protected areas were analysed in 14 investigation areas in Central Europe. Six investigation areas developed a Climate Change Adapted Management Plan (CAMP).

This short paper outlines the procedure to adapt protected area management and develop a Climate Change Adapted Management Plan.

Framework for the adaptation of protected area management

In HABIT-CHANGE, a framework for Climate Change Adapted Management Plans (CAMPs) was drafted (Wilke and Rannow, in prep.). The concept is based on an evaluation of existing management plans and practices as well as the assessment of current land use conflicts. A step by step guideline for the implementation of CAMPs was developed in close cooperation with local conservation management. A CAMP aims at the climate adaptation of all management activities in a protected area. The framework incorporates the concept of adaptive management and allows for evaluation of management effectiveness.

The framework builds on seven steps (WILKE & RANNO, in prep.):

- Definition of objectives and scope of the adaptation process
- Revision of existing management and management plan
- Data collection and inventory of available data

- Assessment of climate change and its impacts on biodiversity
- Stakeholder involvement, communication and participation
- Development of monitoring concept
- Definition of adapted management strategies and measures

The procedure was tested in six investigation areas and experiences have been used to improve the framework in an iterative process.

Challenges and obstacles of the adaptation process

Adaptation to climate change is a complex task and considerable challenge for conservation areas. So far, little experience is available. During the project several major obstacles for implementation of climate change adapted management were identified, which included:

- Missing monitoring or outdated baseline data;
- Lack of awareness and support for climate adaptation (even within the administration of the protected area);
- Uncertainties related to modelling results for climate trends and impacts on biodiversity;
- Missing resources, manpower or expertise in protected area administrations;
- Missing approaches to incorporate modelling output, scenarios and assessment results into decision making and management plans;
- Established management “habits” that are in conflict with the systematic learning process required by Adaptive Management.

Climate change is interacting with non-climatic pressures. This makes it difficult to identify individual drivers and provide clear concepts of causes and impacts. Even if the knowledge about effects of climate change in protected areas is available at local level, it is limited to few specialists, rarely documented and not often exchanged with other protected areas and scientists. HABIT-CHANGE tried to activate this knowledge. It utilized expert knowledge and management experience for impact assessments and the development of adaptation strategies that suit the tasks and competences of protected area management.

Discussion and conclusion

The process of adaptation must be site-specific to meet the needs of individual protected area. A generic framework structured in clearly defined working steps is suited best to fulfil the conditions for an individual adaptation process (RANNOU 2011). It provides guidance without prescribing analytical steps or mandatory obligations (e.g. like modelling efforts). The process builds on existing management strategies and incorporates local knowledge. In addition, effective awareness raising and stakeholder involvement are primary concerns within the CAMP process. It guarantees the reflection of the results from climate impact assessments in future management decisions beyond conservation management (e.g. in agriculture or forest management).

To overcome the identified obstacles in adaptation to climate change at site level the HABIT-CHANGE project developed two practice oriented guidelines for protected area managers that support necessary working steps of the adaptation process. The step by step guideline for stakeholder involvement defines essential working steps and aspects for the communication with stakeholders and provides support with checklists and short background information. The management handbook describes necessary working steps of the adaptation process and allows site managers to “qualify” their management plan into a CAMP. Both guidelines will help to make the first and most important step in the adaptation process: raise awareness for climate change and adaptation needs among local stakeholders and initiate cooperation between conservation management and land users.

CAMP implement the concept of adaptive management in protected area management by institutionalising stakeholder involvement and the development of a monitoring concept that enables area managers to evaluate effectiveness of measures as well as changes in the status of natural resources. The introduction of an active adaptive management (WILLIAMS et al. 2009) allows coping with uncertainties and knowledge gaps in conservation management. Adaptive management includes the definition of measurable and time-bound conservation objectives, an intensive stakeholder involvement throughout the entire management process, modelling of expected impacts of management activities and a structured monitoring of management effectiveness. The intention of adaptive management is to organise the management of natural resources as a learning process, understood as learning by doing. In times of climate change, adaptive management allows to develop adaptation strategies and adapted management measures together with relevant stakeholders and to monitor effectiveness of management under changing climatic conditions. This structured learning process enables conservation managers to gain new knowledge about the impacts of climate change on biodiversity and to evaluate the effectiveness of alternative activities.

Conservation management on site level is in need for methods to address climate change issues (e.g. DAWSON et al. 2011; HOBBS et al. 2010; JULIUS & WEST 2008; STOLTON & DUDLEY 2010). Without active management impacts of climate change will lead to the degradation of habitats, the extinction of species and the loss of ecosystem services that are essential for human well-being. However, adaptation to climate change is not only a challenge; it offers a chance to reshape the future of land use and conservation strategies in individual sites. Most protected species and habitats can only be maintained cooperatively by protected area management and land users. An adaptation process with a wide stakeholder involvement allows the identification of win-win-solutions that conservation management and stakeholders may benefit from and enhances awareness for climate induced changes. Climate change adaptation for protected areas requires an integrated approach that balances conservation goals, economic

growth, and social stability. Strong cooperation and effective coordination will increase the overall resilience of protected areas also in regard to functional and spatial aspects. It provides the opportunity to identify and exploit economic and social chances of adaptation, and thus raise the acceptance for nature protection.

Sufficient funding and staffing as well as capacity building at site level are a prerequisite for effective adaptation. Furthermore, the adaptation process needs backup and support from research, conservation agencies and the policy level. They should help to build capacity, make necessary data and modelling results available and provide the appropriate legal framework for the implementation.

References

- CARVALHO, S., BRITO, J., CRESPO, E., POSSINGHAM, H. 2010. From climate change prediction to actions – conserving vulnerable animal groups in hotspots at a regional scale. *Glob Change Biol* 16:3257-3270
- CHEN, I.-C., HILL, J. K., OHLEMÜLLER, R., ROY, D. B., THOMAS, C. D. 2011. Rapid Range Shifts of Species Associated with High Levels of Climate Warming. *Science* 333:1024-1026
- CRICK, H. Q. P., DUDLEY, C., GLUE, D. E., THOMSON, D. L. 1997. UK birds are laying eggs earlier. *Nature* 388: 526
- DAWSON, T. P., JACKSON, S. T., HOUSE, J. I., PRENTICE, I. C., MACE, G. M. 2011. Beyond Predictions: Biodiversity Conservation in a Changing Climate. *Science* 332:53-58
- HOBBS, R. J., COLE, D. N., YUNG, L., ZAVALETA, E. S., APLET, G. H., CHAPIN III, F. S., LANDRES, P. B., PARSONS, D. J., STEPHENSON, N. L., WHITE, P. S., GRABER, D. M., HIGGS, E. S., MILLAR, C. I., RANDALL, J. M., TONNESSEN, K. A., WOODLEY, S. 2010. Guiding concepts for park and wilderness stewardship in an era of global environmental change. *Front Ecol Environ* 8:483–490
- JULIUS, S. & J. WEST (eds) 2008. Preliminary Review of Adaptation Options for Climate-Sensitive Ecosystems and Resources. <http://www.climate-science.gov/Library/sap/sap4-4/default.php>
- McLAUGHLIN, J. F., HELLMANN, J. J., BOGGS, C. L., EHRLICH, P. R. 2002. Climate change hastens population extinctions. *P Natl Acad Sci USA* 99:6070–6074
- PARMESAN, C., RYRHOLM, N., STEFANESCU, C., HILL, J. K., THOMAS, C. D., DESCIMON, et al. 1999. Poleward shifts in geographical ranges of butterfly species associated with regional warming. *Nature* 399:579–583
- RANNO, S. 2011. Naturschutzmanagement in Zeiten des Klimawandels – Probleme und Lösungsansätze am Beispiel des Nationalparks Hardangervidda, Norwegen. Dissertation. TU Dortmund
- ROOT, T. L., PRICE, J. T., HALL, K. R., SCHNEIDER, S. H., ROSENZWEIG, C., POUNDS, J. A. 2003. Fingerprints of global warming on wild animals and plants. *Nature* 421:57–60
- STOLTON, S. & N. DUDLEY 2010. Managing for climate change – developing strategies for protected area managers. German Federal Agency for Nature Conservation
- WILLIAMS, B. K., SZARO, R. C. & SHAPIRO, C. D. 2009. Adaptive Management. The U.S. Department of the Interior Technical Guide. Adaptive Management Working Group, U.S. Department of the Interior, Washington, DC.
- WILKE, C. & S. RANNO (in prep.) A Methodical Framework for Climate Change-Adapted Management in Protected Areas. In: RANNO, S. & M. NEUBERT (in prep.) Managing Protected Areas in Central and Eastern Europe under Climate Change, *Advances in Global Change Research*, Springer.

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Zeitschrift/Journal: [Nationalpark Hohe Tauern - Conference Volume](#)

Jahr/Year: 2013

Band/Volume: [5](#)

Autor(en)/Author(s): Rannow Sven, Wilke Christian

Artikel/Article: [Adapting conservation management to climate change - Challenges and solutions from protected areas in Central Europe 627-629](#)