

SPECIAL FEATURE:
ECOSYSTEM MANAGEMENT IN TRANSITION IN CENTRAL AND EASTERN EUROPE
EDITORIAL

Ecosystem management in transition in Central and Eastern Europe: the need for a vision

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It is well established that in current human-dominated world, environmental change is closely coupled with socio-economic factors, and this is reflected in conceptual frameworks of important policies (Díaz et al. 2015). Humans are adversely affecting biodiversity and climate change on a planetary scale (Rockström et al. 2009). Anthropogenic transformation of ecosystems has been driven by rapid social and economic changes, manifested by direct drivers such as land use change and climate change (Nelson et al. 2006). Central and Eastern Europe (CEE) has been a rapidly transitioning region in terms of economic growth and political changes. Following the collapse of former Eastern Bloc and revolutions in several CEE countries after 1989, CEE countries have been undergoing political and economic transformation toward democracy and free market. Continuous accession to the European Union also brought in changes of political environment and ecosystem management possibilities and outcomes. Profound socioeconomic changes have influenced environmental condition and ecosystem management in this region, with changing pressures on biodiversity and ecosystem services. Environmental changes in Central and Eastern Europe have been closely linked especially to agricultural policy. For example, inorganic fertilizer use in several CEE countries dropped in a single year to 25% of its former level after the collapse of socialism. This, in turn, had an enormous impact on farmland biodiversity (Stoate et al. 2009).

The Special Feature on “Ecosystem Management in Transition in Central and Eastern Europe” documents and evaluates the impacts of political, institutional, and socioeconomic changes in the region on the local biodiversity and ecosystem functioning. Moreover, this Special Feature aims to assess risks and opportunities to achieve biodiversity conservation and sustainable ecosystem services in the region with consideration of global change and socio-ecological transformation. Therefore, the perspective of socio-ecological system dynamics and ecosystem services under the changing environment is presented in the collection of papers. Thematic papers address several major topics, including analyses of the impacts of long-term land use changes on ecosystem services, scenarios, and visions for future development of ecosystems under land and climate change, changes in biodiversity in these less explored regions, how biodiversity governance through institutional transitions navigates social–ecological systems, and how the combination of traditional knowledge with that of conservation professionals would benefit the maintenance of biodiversity. Thus, this Special Feature provides valuable insights into the vibrant and rich socioeconomic systems of the Central and Eastern Europe.

Knowledge from Central and Eastern Europe has at least two important values. First, two decades of dramatic political change have been accompanied by significant changes in the economy and governance structure. Knowledge on the operation of systems during these changes may provide information to guide similar big events in the future. Considering the recent environmental state of biosphere (Rockström et al. 2009), and the change of climate and socio-economic development, such information is badly needed for mitigation and adaptation to the effects of upcoming changes.

Second, restoration of degraded ecosystems is a key priority for the EU. However, the properties of the target systems are often unknown, as many ecosystems have already disappeared due to intensive environmental change. Data from the low-intensity Central and Eastern European landscapes where sustainable use of resources still exists in some regions can provide necessary baseline information to set restoration targets. Such data will also provide opportunities for improving synergies in the effective delivery of ecosystem services and biodiversity conservation (Ruijs et al. 2013).

We still have much to learn about conservation of biodiversity and ecosystem services in Central and Eastern Europe. Compared to Western Europe, the available research is limited, as is the willingness and possibilities of authorities to apply that research. Nevertheless, biodiversity and the health of ecosystems are still relatively high

(Sutcliffe et al. 2015). These differences are not fully acknowledged in regional or mainly in the EU policies. For example, farmland biodiversity is dramatically declining in the Western Europe, and the investments through agri-environment programs to halt this decline are not effective (Batáry et al. 2015). However, Kleijn et al. (2009) showed earlier that these agri-environment schemes are more effective in less intensively managed regions, like many of Central and Eastern Europe. These results are not reflected in the EU's support for high biodiversity value farmlands.

Finally, papers in this Special Feature recommend formulating a vision for sustainable governance and management of ecosystems, biodiversity, and landscapes in the Central and Eastern Europe. Such a vision should integrate scientific evidence with traditional knowledge. Therefore, to better navigate socio-ecological systems to sustainability in the Central and Eastern Europe, ecosystem management in transition should incorporate ecosystem service perspective as an indispensable link between nature and humans. Socio-ecological approaches to conservation should be promoted (Ban et al. 2013). These include consideration of interactions between nature and people (social and ecological systems), multiple governance systems, development of a common language addressing ecosystem management problems, and integration of stakeholder's objectives. Socio-ecological approaches to management of ecosystem services can provide an integrative basis for the conservation of Central and Eastern Europe's valuable natural capital.

Literature Cited

- Ban, N. C., et al. 2013. Integrating social considerations into conservation planning through a social-ecological systems perspective. *Frontiers in Ecology and the Environment* 11:194–202.
- Batáry, P., L. V. Dicks, D. Kleijn, and W. J. Sutherland. 2015. The role of agri-environment schemes in conservation and environmental management. *Conservation Biology* 29:1006–1016.
- Díaz, S., et al. 2015. The IPBES Conceptual Framework — connecting nature and people. *Current Opinion in Environmental Sustainability* 14:1–16.
- Kleijn, D., et al. 2009. On the relationship between farmland biodiversity and land-use intensity in Europe. *Proceedings of the Royal Society B-Biological Sciences* 276:903–909.
- Nelson, G. C., et al. 2006. Anthropogenic drivers of ecosystem change: an overview. *Ecology and Society* 11:29.
- Rockström, J., et al. 2009. A safe operating space for humanity. *Nature* 461:472–475.
- Ruijs, A., A. Wossink, M. Kortelainen, R. Alkemade, and C. J. E. Schulp. 2013. Trade-off analysis of ecosystem services in Eastern Europe. *Ecosystem Services* 4:82–94.
- Stoate, C., A. Báldi, P. Beja, N. D. Boatman, I. Herzon, A. van Doorn, G. R. de Snoo, L. Rakosy, and C. Ramwell. 2009. Ecological impacts of early 21st century agricultural change in Europe – a review. *Journal of Environmental Management* 91:22–46.
- Sutcliffe, L. M. E., et al. 2015. Harnessing the biodiversity value of Central and Eastern European farmland. *Diversity and Distributions* 21:722–730.

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