Editorial

Alpine protected areas (PAs) play a key role in the conservation of biodiversity but also in the monitoring of species and habitats. Only PAs can ensure long-term monitoring, over many years, far beyond normal scientific project durations, with professional equipment and staff on the ground. This feature makes PAs especially precious for the sciences, for the development of management measures and their testing, and for political decisions concerning the conservation of biodiversity.

Intact habitats and ecosystems provide greater chances for a healthier and more resilient environment. In the coming decades, PAs in the Alps should join forces to develop a common transboundary monitoring system of species and habitats, allowing the evolution of alpine ecosystems and biodiversity to be evaluated under the light of climate change. If the indicators and species are well chosen, an Alps-wide monitoring system could play an important role as an early warning system for biodiversity loss in the region.

To be realistic and acceptable to PA managers, a common monitoring system should be based on relevant species, using simple indicators which can be easily harmonized and used for scientific evaluations. The goal is to define a common minimum standard, among PAs, of existing monitoring methods.

Since its first issue, *eco.mont* has published articles about long-term monitoring programmes in various areas in the Alps (see e.g. Robinson & Oertli 2009; Robinson et al. 2011; Güsewell & Klötzli 2012; Bohner et al. 2012; Mayer & Erschbamer 2014; Fischer et al. 2014; Bonet et al. 2016; Battisti et al. 2019). To further underline the importance of monitoring programmes in PAs, after an internal review the editors and the Editorial Board decided to accept and publish in this issue a long paper by Körner et al. The 17 authors present the conceptual framework and a summary of the first five years of findings of the broad, interdisciplinary, long-term monitoring programme of terrestrial and aquatic alpine biota in the Hohe Tauern National Park (NPHT) in the Alps (Austria, Italy and Switzerland). The concept was developed in 2011 by the Scientific Advisory Board of the NPHT, on the initiative of the three NPHT directors, and finally realized in 2016. It consists of a total of eight research modules and uses highly standardized observation and analysis methods. The unusual comprehensiveness of this monitoring programme and the fact that it is a practice of use potentially to all PA managers, led us to accept the paper, in spite of its length. We are very excited to offer it to our readers, and would be interested to read and learn more in the future about long-term studies in the Alps and globally.

The other articles in this issue highlight once again the many topics within mountain PAs, but also the need to protect species living in mountain areas which are not yet protected.

A further long-term monitoring study, by Christopher T. Robinson, Christa Jolidon, Gabriele Consoli, Simon Bloem & Christian Ebi, takes us to the Macun lakes in the Swiss National Park. This study started in 2001 and was followed by annual monitoring of the physico-chemistry as well as of the temperature of the water at 10 primary sites in various basins and outlet streams (see also Robinson & Oertli 2009; Robinson et al. 2011).

Another study in this issue is concerned with the threatened ungulates *Ammotragus lervia* and *Gazella cuvier* in the semi-arid North African Nador Mountains. Farid Bounaceur, Aoued Boualem, Abdelkader Abdi, Fatima Zohra Bissaad, Mohamed Amine Kaddouri, Mohamed Djilali, Azeddine Zenati, Yahia Belgarssa & Stéphane Aulagnier assess the local distribution and estimate the abundance and population composition of the ungulates, which are listed as Vulnerable in the IUCN list. The results indicate that new conservation measures in the region are required.

Hilal Turgut & Bülent Turgut examine the effects of landforms and climate on vegetation dynamics in the Caucasus over a period of three years. The study area is characterized by high mountains and high biodiversity. The results may serve practitioners in gauging the possible consequences of climate change and managing sites accordingly.

Huiying Xue, Da Qing Luo, Bu Duo, Qing Xue, Xing Le Qu & Wen Wen Guo studied the community structure and diversity of soil nematodes at twelve selected plots around Lake Paiku in the Mount Qomolangma National Nature Reserve in Tibet, China. Due to the region's high altitude, cold dry climate and slow plant growth, it is difficult for an ecosystem to recover if it is degraded. The results show that the soil nematode community around Lake Paiku is rich in diversity but low in population density.

Sony Lama, Saroj Shrestha, Ang Phuri Sherpa, Munmun Tamang & Dinesh Ghale present the avifaunal diversity in a district in Western Nepal. Illegal hunting and trapping, hydropower projects, habitat fragmentation as well as the Covid-19 pandemic pose threats to the avifauna, which has already decreased in numbers due to human interference. The authors give an update on the bird checklists, the first since 2015.

With this issue, we once again hope to raise awareness of the importance of mountain protected areas, and with the publication of long-term studies we support and outline the interaction of scientists and PA managers.

Finally, we would like to take this opportunity to introduce and welcome two new members of the eco.mont Editorial Board: Clara Tattoni and Florian Knaus. Clara Tattoni is a research fellow at the Environment Analysis and Management Unit (*Unità di Analisi e Gestione delle Risorse Ambientali*, UAGRA), a research unit of the Department of Theoretical and Applied Sciences of the University of Insubria in Varese, Italy. She has published on various topics including land-use change, forestry, biodiversity and Alpine ecosystems. Florian Knaus is currently a lecturer at the ETH Zurich, Department of Environmental Systems Science, Institute of Terrestrial Ecosystems, where he holds the Chair of Ecosystem Management. He is also the Scientific Coordinator of the Entlebuch UNESCO Biosphere.

At the same time, Astrid Wallner and Massimo Bocca are leaving the Editorial Board of eco.mont. We wish them both all the best for the future and thank them warmly for their engagement with the journal.

Valerie Braun, Guido Plassman & Günter Köck

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