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EDITORIAL

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Launched to accelerate biodiversity conservation

Nature Conservation – a new dimension in Open Access publishing bridging science and application

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Abstract

This Editorial presents the focus, scope and policies of the inaugural issue of Nature Conservation, a new open access, peer-reviewed journal bridging natural sciences, social sciences and hands-on applications in conservation management. The journal covers all aspects of nature conservation and aims particularly at facilitating better interaction between scientists and practitioners. The journal will impose no restrictions on manuscript size or the use of colour. We will use an XML-based editorial workflow and several cutting-edge innovations in publishing and information dissemination. These include semantic mark-up of, and enhancements to published text, data, and extensive cross-linking within the journal and to external sources. We believe the journal will make an important contribution to better linking science and practice, offers rapid, peer-reviewed and flexible publication for authors and unrestricted access to content.

Keywords

Nature Conservation, biodiversity, conservation science, conservation policy, conservation management, semantic markup, semantic enhancements, data publishing

Introduction

Nature conservation is an essential element in the cultural development of humans. Our approaches to protect nature are continuously changing with major implications for conservation science and hands-on, practical applications (Haila 2012). Humans have been extraordinarily successful in part because of our ability to manipulate ecological systems and the services they provide (Chapin et al. 2001). Yet, rapid population growth and growth in consumption, especially since the Industrial Revolution,

have led to the substantial exploitation of Earth's natural resources (Orr 2006). As a consequence, we are losing species and are causing detrimental changes to natural ecosystems at an unprecedented rate (Groombridge 1992, Kuussaari et al. 2009, Butchart et al. 2010). We are undermining the capacity of ecosystems to support human life (Daily 1997, MEA 2005, Garibaldi et al. 2011). There is good evidence that the loss of ecosystems and the services they provide have already contributed to the demise of some societies (Tainter 1988, Ehrlich and Ehrlich 2004, Diamond 2005). Threats to nature conservation occur at local to global scales, including trade globalization, climate change and land-use change. These processes are non-linear across scales and approaches to manage them often do not address the most relevant spatial or temporal scales and therefore are often inefficient or fail completely (Henle et al. 2010). Moreover, management actions are mostly driven by short-term economic or political interests that may only benefit certain sectors of society, rather than addressing broader-scale and longer-term nature conservation issues to the benefit of current and future generations.

Despite tremendous growth and progress in research on biodiversity (including nature conservation) (Fig. 1), increasing political commitments, such as the establishment of the Intergovernmental Panel for Biodiversity and Ecosystem Services (IP-

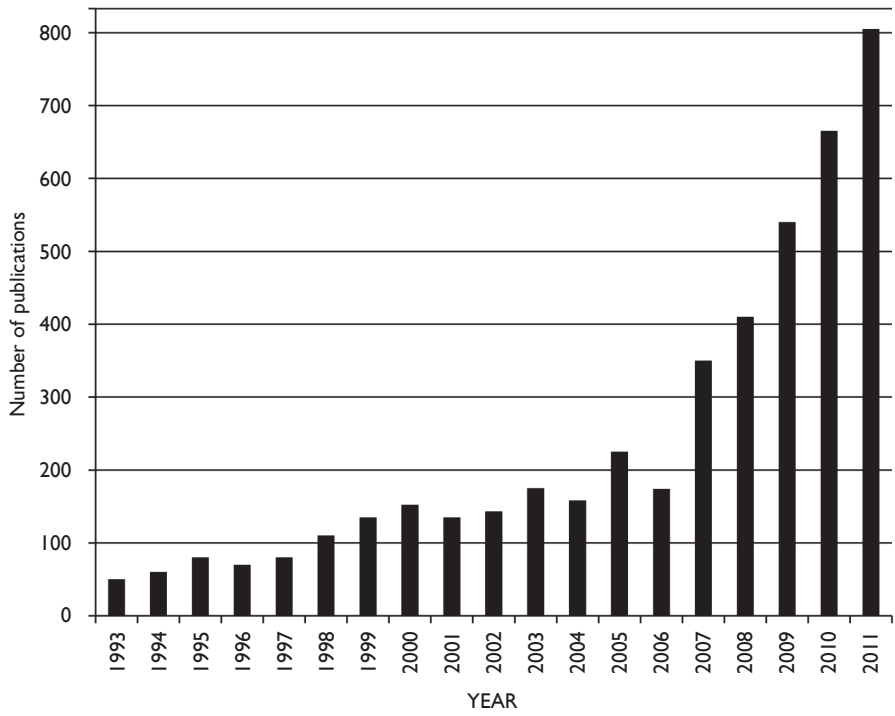

Figure 1. Increase in the number of publications in the field of biodiversity and nature conservation, created from the Web of Science using the string: Title = „biodiversity" OR „nature conservation" OR Topic ="biodiversity" OR „nature conservation".

BES) (Görg et al. 2010), and practical achievements, such as the major extension of the networks of protected areas across the world (World Database on Protected Areas http://www.wdpa.org/, Evans 2012), we are far from achieving our targets in nature conservation (Walpole et al. 2009). Moreover, conservation targets are continuously shifting over time (Haila 2012). For example, there is currently a strong tendency to focus on ecosystem services in national and international strategies for biodiversity conservation, sometimes together with the belief that only such a focus can create a sufficiently high profile for conservation to bring it on par with other societal interests (e.g. development). Yet, others argue that this may be a dangerous approach because the modification and transformation of natural ecosystems for an improved delivery of specific ecosystem services can be a major contributor to the decline of natural ecosystems and their associated biota [see, for example, Skroch and López-Hoffman (2009) and Adams and Redford (2009) for opposing opinions].

While there is a current trend to use nature as service provider as a way of promoting conservation more broadly, other motivations can drive the development of conservation ethics and movements, including the emotional attachment of humans to nature (Leopold 1949, Haila 2012). And if we are successful, we often create new problems. For example, some species have returned to ranges from which they have been extirpated, for example, top-level carnivores that often create considerable conflicts among humans with different interests and ethics (White et al. 2009, Klenke et al. in press).

As a consequence, balancing anthropocentric and ecocentric views regarding nature conservation remains a major challenge for current research, policy and applied biodiversity conservation. A range of priority scientific questions (e.g. Sutherland et al. 2012) and unresolved policy and management issues have already been identified for the coming decades at the national (e.g. DEFRA 2011), European (EU 2020 Biodiversity Strategy ttp://ec.europa.eu/environment/nature/biodiversity/policy/), and global levels (Aichi targets of the CBD http://www.cbd.int/sp/targets/).

To be effective, research on natural resource management and conservation must be communicated to practitioners involved in hands-on conservation efforts and to policy makers. However, the results of scientific research are often not readily applied in management. Many applied conservation schemes do not reflect current research knowledge (e.g. Lynne et al. 2010). The "knowledge-implementation-gap" (Knight et al. 2008) is increasingly becoming obvious. As a consequence, the 10th Party of the Convention on Biological Diversity, in Nagoya October 2010, identified a strengthened link between science and policy as an explicit target (http://www.cbd.int/sp/targets/). This requires new alliances between science, economics, policy makers, and natural resource managers (Briggs and Knight 2011).

A major goal of the interdisciplinary journal **Nature Conservation** is to support synergistic interactions among scientists, policy-makers and managers. This is a practical task. The knowledge base of conservation biologists is already extensive, and the numbers of experienced practitioners are increasing around the world. The task is to bring different specialists together and create a forum that supports knowledgeable practices, and to learn from the experience – successes and failures – of all parties. The

journal specifically aims at strengthening the link between science, policy and management by publishing timely, innovative papers with clear practical relevance.

The papers selected for the first volume of **Nature Conservation** largely reflect this vision. The paper by Evans (2012) provides background information on the development of the largest network of protected areas in the world, the European Union's Natura 2000, and the process for assessing successes and gaps in the network. This may facilitate similar developments elsewhere in the world. The contribution by Haila (2012) highlights the continuously changing approaches to nature conservation and their dependence on societal and political backgrounds (called 'Zeitgeist'). Based on these relationships, Haila recommends how to address current and future problems in nature conservation. The paper by Votsi et al. (2012) assesses the relationship between road networks and biodiversity in Natura 2000 areas in Greece, which contributes to our knowledge of the effectiveness of protected areas in this country and beyond. The final paper, Van Sway et al. (2012), translates current knowledge on the conservation biology of butterflies into recommendations for the conservation and management of butterfly species listed in the Annexes of the European Habitats Directive.

Challenges of innovative publishing

The publication and dissemination of scientific information have reached conceptually new dimensions in the past decade. Although a large part of the scholarly literature is still published in the traditional manner (i.e. printed books and journals), publishers are increasingly moving towards entirely digital or a combined (conventional and digital) model for the publication of scientific data. Digital publishing is evolving rapidly in the area of 'Open Access', a model that is increasingly taking over from the 'restricted access' forms of publishing. There are many reasons for publishers to change their publication models, but this process is mainly driven by strong demands from the scientific community to publish in a format that allows quick discovery, integration, re-use and dissemination of the research data without any financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself (see for instance the Panton principles).

Pensoft is among the leading proponents of Open Access publishing of data relating to biodiversity. For this purpose, the company has developed a number of innovative products to support aggregation, interlinking, converting and the dissemination of published information, such as the publication platform TRIADA, Pensoft Mark-up Tool, Pensoft Wiki Converter, and Pensoft Taxon Profile. Several others are currently under development (Penev et al. 2010, Erwin et al. 2011). These technological innovations make it possible to link scientific information published in Pensoft's journals to various related sources and automatically distribute it through community networks, wiki environments, and indexing and aggregation services. The maximal 'Itemization' of the content of scientific papers into various independently informative components, such as taxon treatments, locality records, habitat descriptions and others, ensures bet-

ter integration, interlinking and dissemination of the research data. This has been one of the core elements in the company's vision for technical development of the publication platform. In addition, recently Pensoft has invested considerable resources into developing a sustainable model for publication, dissemination and long-term preservation of data relating to biodiversity.

Nature Conservation is a new-generation journal and can be seen as a platform comprising both innovative algorithms and a routine medium for the publication of data related to biodiversity. As with most of Pensoft's journals, **Nature Conservation** is based on cutting-edge Web 2.0 technologies, own content management software and XML-based editorial workflows. By providing a rapid and straightforward publication process, data publication options, and several tools for data sharing and integration, the journal is on the frontline of the present-day technological revolution in scholarly publishing and communication. In addition to "conventional" publication practices, the journal implements functionalities aimed at capturing, storing, integrating and disseminating information related to basic and applied conservation ecology and nature conservation. **Nature Conservation** adopts a *multiple-choice data publishing model* that enables the publication of data of different types and complexity as follows: (1) supplementary files published along with the perspective papers; (2) data files, submitted to data repositories as independent files and linked to the journal article for which they provide evidence; (3) data published through data repositories and aggregators, but indexed within larger databases (e.g., Genbank and the Global Biodiversity Information Facility, GBIF); and (4) data published in the form of marked-up, structured and machine-readable texts. Datasets can also be published as independent papers in the form of peer-reviewed scholarly publications called "data papers" (Chavan and Penev 2011, Penev et al. 2009).

Focus and scope

The journal's major characteristics include:

- Open access to the published scientific content and a barrier-free environment for the dissemination of results
- A rapid and straightforward publication process
- Publication of articles in four different formats: (1) full-colour, high-resolution print version; (2) PDF for reference to the printed version and easy archiving; (3) HTML for easy reading, browsing and applying semantic enhancements to the text; and (4) XML to provide a machine-readable file for archiving and data mining
- Semantic mark-up of and semantic enhancements to published texts using the TaxPub XML schema, an extension of the DTD (Document Type Definitions) of the National Library of Medicine (USA) (Catapano 2010, Penev et al. 2010, 2011) ensuring the enrichment of content via links to external sources and interlinking within the article body

- Automated cross-linking through the Pensoft Taxon Profile with major indexing and aggregation platforms, such as the Global Biodiversity Information Facility (GBIF), Encyclopedia of Life (EOL), the International Plant Name Index (IPNI), ZooBank, the National Center for Biodiversity Information (NCBI), Genbank and Barcode of Life, the Biodiversity Heritage Library (BHL), Pub-Med, PubMedCentral, Mendeley, and many others
- Publishing occurrence data and taxon checklists/inventories using the Darwin Core standard. This is supported by a specialized tool of GBIF, the Integrated Publishing Toolkit (IPT)
- Infrastructure for the publication and indexing of data papers
- Data communication strategy and workflow through an already established system of press releases and posts to social networks
- No restriction in volume or usage of colour

One of the key features of **Nature Conservation** is a strong emphasis on the dissemination of published results. The journal's contents will be harvested automatically by the Directory of the Open Access Journals (DOAJ), Citebank of the Biodiversity Heritage Library, BASE - Bielefeld Academic Search Engine, Vifabio.de, Scirus, Scientific Commons and other indexing platforms. From the very start, **Nature Conservation** will be submitted for indexing and coverage by ISI Web of Science, Scopus and PubMedCentral.

The journal will consider publishing the following types of manuscripts:

- Original research articles
- Comprehensive reviews, historical analyses, ecological modelling and scenarios
- Monographs and collections of papers with no limit in size, published as 'special issues'
- Applied conservation papers
- Short communications
- Letters and Forum papers
- Trend scanning papers
- Datasets and Data papers
- Web-based tools
- Book reviews

Nature Conservation strongly encourages papers on ethical, social, economic, legal and policy issues related to the management and use of biodiversity and ecosystems. Authors or editors publishing large review papers, conference proceedings, Festschrift volumes, etc. will benefit from having ISBN numbers assigned to their work, providing in this way additional dissemination and promotion of the published data through the book industry network.

We are convinced that **Nature Conservation** will establish a new model of publishing and dissemination in basic and applied conservation ecology and nature

conservation in general at various spatial, temporal and evolutionary scales, from populations to ecosystems and from microorganisms and fungi to higher plants and animals, taking advantage of exciting possibilities in the application of the semantic Web. The new technologies implemented in the journal will permit ecologists, conservationists and any other reader anywhere to harvest, within seconds, the most essential information (e.g., descriptions, images, maps, keys, gene sequences and references) on a taxon, locality, or even a specimen. **Nature Conservation** is committed to enhance the access to ecological data and to speed up the free dissemination of knowledge about life on Earth.

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