



Newsletter

Issue 2

March 2012

The purpose of this newsletter is to disseminate the results of the SCALES project among stakeholders and the general public and to continue the dialogue between administrators, managers and policy-makers on the one hand and the scientific community on the other hand on scales-related biodiversity conservation issues. It will be used as a communications tool for dissemination of information to interested parties and will keep them informed of all planned activities and recent news.

To subscribe to SCALES newsletter please contact: info@pensoft.net

Dear readers,

The SCALES project has reached its vertex and made a big step forward. Not only our products grew in number, also the number of our partners, countries and even continents joining the project increased. Meanwhile, SCALES has additional partners from Cyprus and Taiwan and now spans across Europe, Asia and Australia. The newsletter will provide you information about recent achievements, selected results, and future activities of SCALES. More information is provided on our website www.scales-project.net.

Kindest regards,

Dr. Reinhard Klenke
SCALES Project Manager



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1. Recent progress/results from SCALES

Second and third annual meeting

SCALES held its Second annual meeting in Sofia, Bulgaria, and was externally reviewed on 12-15 April 2011. Representatives of all partner institutions gathered together to discuss the achievements of the second year and the next steps. During the meeting three external scientists reviewed the first 18 months of the project and gave very positive comments to the accomplished results. The next SCALES annual meeting will be held on 19-23 March 2012 in Nicosia, Cyprus.

Deliverables and publications

In the first period we produced 11 Deliverables including the first periodic report. Since this last report we have produced already twice as many Deliverables although this period is still running. Additionally, several high-ranked papers were published, among them one in *Nature*. Please find more about this output at <http://scales-project.net> and on the following pages.

New version of the ZONATION software for conservation prioritisation available

A new version of ZONATION is now available online from the Metapopulation Research Group in Helsinki at: <http://www.helsinki.fi/bioscience/consplan/software/Zonation/index.html>. ZONATION v. 3.1. It has been developed under the lead of Atte Moilanen and has several improvements and new features to facilitate conservation planning. The new analytical features help to deal better with different goals for different administrative units, alternative land-uses, community level analysis, landscape condition and retention as well as with matrix connectivity. The Graphical User Interface (GUI) is a completely new functionality and the program is now available also in a 64 bit version. You will find more about first results of analyses using ZONATION 3 in the section **Recent Publications** below.



Attendees at the SCALES Annual meeting in Sofia.
Photo: Pavel Stoev.



Vesna Grobelnik presents the progress on the SCALES tool. Photo: Pavel Stoev.

2. Policy news

SCALES will be filling gaps in the knowledge and information about the impact of climate change on biodiversity Convention on Biological Diversity CBD – COP 11 8-19 October 2012, Hyderabad, India

Axel Paulsch & Klaus Henle

The CBD will hold the 11th Conference of the Parties (COP 11) in October in Hyderabad, India. This is the first CBD-COP in the recently declared UN-decade of Biodiversity. After the big success of COP 10 in Nagoya in 2010 to agree on 20 ambitious targets until 2020 it is now time to take steps to implement measures to really reach these targets. Therefore, the agenda of COP 11 holds several items that are based on the outcome of COP 10 but need specification now. For example, target 15 claims that until 2020 15% of degraded ecosystems should be restored. The question is now, which 15% this should be, from a scientific perspective as well as from a political viewpoint. Another agenda item deals with target 11 where it was agreed that until 2020 17% of terrestrial and inland water areas are conserved through ecologically representative and well connected systems of protected areas. It has now to be discussed, where these protected areas should be established and how connectivity can be reached.

COP 11 will discuss the further development of tools and guidance for monitoring implementation of the 20 targets, including the use of indicators, which are developed for all targets. Here guidance is needed on how indicators can be used on different scales and in different regional contexts, in order to integrate local or regional findings on implementation success to a more global picture.

Under the topic biodiversity and climate change COP 11 will discuss ways to integrate biodiversity considerations into climate change-related activities and options for addressing gaps in knowledge and information on the impact of climate change on biodiversity. SCALES contributes to filling these gaps.

At COP 10 the developing countries only agreed to the 2020 targets under the precondition of a substantially higher financial support to implement these targets and the developed countries, which will have to provide this money, argued that there should

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first be national assessments for the real needs, before a concrete budget can be discussed. These assessments will be the most discussed political issue at COP 11, as the whole financial architecture of global environmental conservation is under question. Research on instruments of fiscal transfers for achievements in biodiversity conservation, as carried out in SCALES, could contribute to resolve existing problems.

COP 11 is open for participation of everybody interested and scientific results relating to agenda items can be presented in so called side events during the whole two weeks of the meeting. SCALES and its relevance for topics negotiated were already presented in such a side event at COP 10 in Nagoya. SCALES was one of four projects selected for representing biodiversity research funded by the EU.

SCALES meets EEA, 20 June 2011, Copenhagen, Denmark

Reinhard Klenke & Klaus Henle

On 20 June 2011 the SCALES coordination organised a meeting between SCALES and the European Environmental Agency (EEA) in Copenhagen. Ten SCALES-fellows representing the work packages 1-6 have met 20 colleagues from 6 programmes in EEA to discuss about methods and products that were developed in SCALES and EEA to identify areas of common interests and collaboration. Important topics were: 1) scaling of drivers and pressures and planned case studies, 2) Green Infrastructure, 3) representativeness of protected areas and the ZONATION conservation planning software, 5) the Biodiversity Information System for Europe (BISE) <http://www.eea.europa.eu/publications/bise>, and 6) the SCALES Tool.



The workshop identified several topics of mutual interest and resulted already in synergies. SCALES already contributed with information from a GAP analysis in the coverage of Annex II species of the Habitats Directive in the Natura 2000 network of protected areas in Europe and in each Member State to the EEA Technical Report "Protected Areas in Europe" on the implementation of the Habitats Directive that will be published soon.

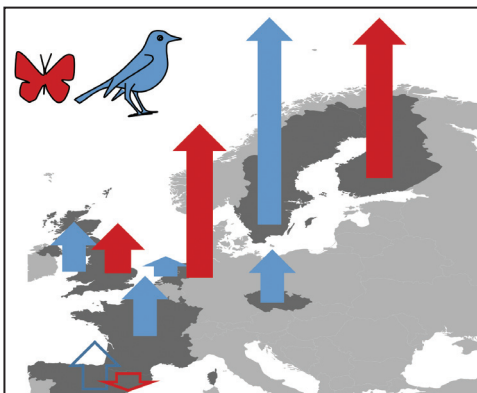
EEA provided a report about landscape fragmentation that complements research on the effects of habitat fragmentation on biodiversity currently on-going in SCALES. <http://www.eea.europa.eu/publications/landscape-fragmentation-in-europe>

Further bilateral meetings were organised to discuss assessments of drivers, their scaling properties and their impacts on biodiversity.

3. Selected recent publications from SCALES

The European debt: even birds and butterflies pay their bill

Lluís Brotons & Isabelle Leviol



Measuring climate change impact on biodiversity is a difficult task. In a study published this week in *Nature Climate Change*, a team of European scientists show that European birds and butterflies do not adjust their abundance according to the northward shift of their suitable climates. This pan-European collaborative work provides the first evidence that climate change is inducing an important climatic debt for these animals at a continental scale. Birds and butterflies have accumulated a 212 km and 135 km lag behind climate respectively, during the last two decades. As a consequence, climate change may disrupt multiple interactions between species. The authors propose a simple method to map and quantify whether, how, and where, different taxonomic groups are affected by climate change. Interestingly, these results are based on volunteer-based monitoring programs in which many people freely contribute to collect data of high importance for scientific research. More than 1.5 millions hours have been spent by volunteers to collect the data necessary to this study.

DEVICTOR, V., VAN SWAAY, C., BRERETON, T., BROTONS, L., CHAMBERLAIN, D., HELIÖLÄ, J., HERRANDO, S., JULLIARD, R., KUUSSAARI, M., LINDSTRÖM, Å., REIF, J., ROY, D.B., SCHWEIGER, O., SETTELE, J., STEFANESCU, C., VAN STRIEN, A., VAN TURNHOUT, C., VERMOUZEK, Z., DEVRIES, M.W., WYNHOFF, I., JIGUET, F. (2012) Differences in the climatic debts of birds and butterflies at a continental scale. *Nature Climate Change* 2: 121-124.

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New findings by Virginie Stevens (CNRS), Jean Clobert (CNRS), Michel Baguette (Muséum National d'Histoire Naturelle) and colleagues show that interactions between dispersal and life-histories are complex, but general patterns emerge. The study was published as open access paper in the journal Ecology Letters.

The map shows the temporal trend of bird and butterfly CTI for each country. The height of a given arrow is proportional to the temporal trend and its direction corresponds to the sign of the slope (from south to north for positive slopes)

Butterflies: 'Twice-punished' by habitat fragmentation and climate change

As dispersal plays a key role in gene flow among populations, its evolutionary dynamics under environmental changes is particularly important. The inter-dependency of dispersal with other life history traits may constrain dispersal evolution, and lead to the indirect selection of other traits as a by-product of this inter-dependency.

The authors identified traits that are predicted to co-vary with dispersal, and investigated the correlations that may constrain dispersal using published information on butterflies. The quantitative analysis revealed that (1) dispersal directly correlated with demographic traits, mostly fecundity, whereas phylogenetic relationships among species had a negligible influence on this pattern, (2) gene flow and individual movements are correlated with ecological specialisation and body size, respectively, and (3) routine behaviours only affected short-distance dispersal. Together, these results provide important insights into evolutionary dynamics under global environmental changes, and are directly applicable to biodiversity conservation.

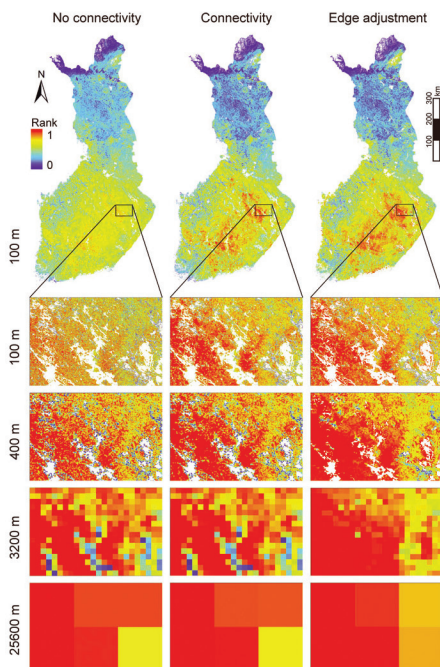
Specialist species with narrow tolerance to temperature are also those butterflies that have weak dispersal ability. For such species, the combination of habitat fragmentation and climate warming is thus a kind of 'double penalty'. Those species should thus be the priority targets in conservation actions. Besides, these results show that the size of a butterfly is not a reliable proxy of most of the components of its ability to disperse across inhospitable parts of landscapes, and is particularly poor at describing species' ability to maintain spatial gene flow.

STEVENS, V. M., TROCHET, A., VAN DYCK, H., CLOBERT, J., BAGUETTE, M. (2012) How is dispersal integrated in life histories: a quantitative analysis using butterflies. *Ecology Letters*, 15: 74-86. doi: 10.1111/j.1461-0248.2011.01709.x

Connectivity and Spatial Resolution can have a substantial impact on Conservation Prioritization

The outcome of analyses that prioritize locations for conservation on the basis of distributions of species, land cover, or other elements is influenced by the spatial resolution of data used in the analyses. Anni Arponen and colleagues used ZONATION 3.0 to explore the influence of data resolution on prioritization of Finnish forests. Inclusion of connectivity or edge adjustment changed the location of areas that were prioritized for conservation. Even though different locations received high priority for conservation in analyses with and without accounting for connectivity, accounting for connectivity did not reduce the representation of different forest types. Inclusion of connectivity influenced most the outcome of fine-resolution analyses because the connectivity extents basing on dispersal distances of typical forest species were small. When the area set aside for conservation was kept constant, representation of the forest types increased as resolution increased. Now it is not anymore necessary to avoid use of high-resolution data in spatial conservation prioritization because of limitation in computer memory and processor power. The results show that large extent, fine-resolution analyses are computationally feasible, and can give more flexibility to implementation of well-connected reserve networks.

ARPONEN, A., LEHTOMÄKI, J., LEPPÄNEN, J., TOMPPONEN, E., MOILANEN, A. (2012) Effects of Connectivity and Spatial Resolution of Analyses on Conservation Prioritization across Large Extents. *Conservation Biology*. doi:10.1111/j.1523-1739.2011.01814.x



4. SCALES launched *Nature Conservation* - An innovative journal in Conservation Ecology

The journal *Nature Conservation* (www.pensoft.net/journals/natureconservation) was established within SCALES in July 2011 to mobilize ideas and data in basic and applied conservation ecology. It offers numerous innovative ways to publish and disseminate information in all aspects of conservation of nature. *NC* is not a conventional journal but linked environment built upon its own content management software. Linking is provided at the internal level (within an article, within the journal, or within the publishing platform of Pensoft) and to external resources (Global Biodiversity Information Facility, Encyclopedia of Life, Biodiversity Heritage Library, PubMed and PubMedCentral, Morph-

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bank, International Plant Names Index, Tropicos, The Gymnosperm Database, ZooBank, Wikipedia, Wikispecies, Species-ID, etc.), through a dynamic web profile of each biological taxon mentioned within a paper (www.ptp.pensoft.eu). Geo-referenced localities can be mapped within taxon treatments or for the entire paper. The journal is actively promoted and disseminated through RSS, press releases, social networks (Twitter, Facebook, Mendeley), and many other ways. *Nature Conservation* is published in four different formats: (1) high-resolution, full-color print version (2) PDF identical to the printed version; (3) HTML to provide links to external resources and semantic enhancements to published texts for interactive reading; (4) XML version compatible to PubMedCentral archiving, thus providing a machine-readable copy to facilitate future data mining. Neither restriction nor charges are imposed on the use of color illustrations.

Ecologists and conservationists submitting manuscripts in *Nature Conservation* will benefit from:

- ◆ Advanced and innovative publishing technologies, including data publication and various semantic enhancements to published papers
- ◆ Open access to all published contents
- ◆ Online submission and editorial management system, professional review and editorial assistance, typesetting, proofreading and publication
- ◆ No limit in manuscript length; large collections of papers, conference proceedings, monographs, checklists, etc., will be published as separate issues under both ISSN and ISBN numbers
- ◆ Rapid publication process
- ◆ Immediate Alert Service through Email and RSS feeds and social networks
- ◆ Data publishing under separate DOI numbers; data section providing automated generation and mark up of manuscript from the metadata catalogue of the Global Biodiversity Information Facilities (GBIF), based on EML (ecological Metadata Language)
- ◆ Immediate distribution and dissemination of publication to scientific databases, indices, and search engines, such as PubMedCentral, Cab Abstracts, Scopus, Google Scholar and many others
- ◆ Author copyright and distribution under the Creative Commons Attribution 3.0 license
- ◆ No extra publication charges for color illustrations
- ◆ A full-color, high-resolution print version

5. Workshops

Uncertainty in Biodiversity Research: a Workshop Report

Yrjö Haila

Uncertainty is an essential element of science, but in biodiversity science uncertainty has been addressed mainly with a narrow focus. Millennium Ecosystem Assessment (Chapter 4, Biodiversity) takes up uncertainty only in connection with estimates of species numbers. This, definitely, is not sufficient. We are confronted with several types of uncertainties when building up support for specific goals in biodiversity protection. In what ways does this matter?

To explore such issues, two round-table discussions were held at the UFZ in November–December last year, with the title *Exploring uncertainties in biodiversity science, policy and management*. The first one was closely affiliated with SCALES project, into the latter we invited several participants from outside the project (from Brazil, Taiwan, The Netherlands, Norway and Finland). The perspective of the workshops was pragmatic, and the SCALES project had a strong presence in the discussions throughout. The results will be drawn together and published in due time; at this stage they can be summarized under two themes:

First, identifying sites – or “locations” – of uncertainty in actual research practice. We ended up with the list: [1] fieldwork and the quality and representativeness of data; [2] proxies used for compressing and economizing the data; [3] models and simulations; [4] the adequacy (or inadequacy!) of conceptual devices used; and [5] the relevance (or irrelevance!) of policy advice as regards requirements of actual decision-making situations. *Second, proper strategies of coping with uncertainty.* We clarified the range or perspectives against pairs of contrasts such as: [1] the source of uncertainty: insufficiency of



knowledge versus inherent unpredictability of processes in the world; [2] the goal: reducing uncertainty versus embracing uncertainty; [3] proper source of normative standards: "naturalness" versus attributes of ecological functionality such as "integrity" or "resilience;" and [4] coherence between research and policy: enablement for versus constraint of imaginative research.

A general conclusion was that an adequate strategy for coping with uncertainty requires a learning process that couples together all aspects of research and science-policy interactions.

6. New SCALES partners

Open University of Cyprus

Ioannis Vogiatzakis



The **Open University of Cyprus** was founded in 2002, admitted its first students in 2006 and had its first graduates in 2008. This new and expanding university was established to fill an important gap for open and distance education in the higher education system of the Republic of Cyprus, in response to the growing demand for continuing education and lifelong learning.

The mission of the Open University of Cyprus (OUC) is the promotion of education and lifelong learning through teaching and research, the enrichment of the cultural, social and economic development of Cyprus and its promotion as a centre of education and research in the neighbouring region. The OUC aspires to become a leading university in the Cypriot and broader European system of higher education, by offering students the most advanced technological infrastructure and educational methods for distance teaching, enabling learning without borders.

The OUC is expanding its international presence by forging alliances with universities and research centres, for the promotion of education, lifelong learning, research and student and staff exchanges. OUC is also a member of various European and international university organizations and networks (such as EADTU, EDEN, ICDE, and EURASHE).

Part of what makes a successful university is a strong record in research. The Open University of Cyprus promotes broad, vibrant and quality research in the various disciplines and scientific areas of its programmes, funded either through the University's budget or by other national and European funding institutions. Encouraging its academia to collaborate in research projects, both at national and international level, the OUC is growing fast, fostering and supporting aspiring research personnel.

Today, the OUC has approximately 2500 students, enrolled in 10 programmes of study. As of the following academic year 2012-2013, the OUC is expecting to reach numbers of more than 3500 students.

There are three faculties currently at OUC, offering undergraduate and postgraduate degrees: the Faculty of Humanities and Social Sciences, the Faculty of Pure and Applied Sciences and the Faculty of Economics and Management. Research at OUC has been funded by various EU Framework Programmes, the Lifelong Learning Programme, the Cyprus Research Foundation and Government Agencies.

University of Kent and DICE

Joseph Tzanopoulos

The **University of Kent**, the "UK's European university" with campuses in Canterbury, Brussels and Paris, is a leading UK university that makes a major economic, social, and cultural contribution: by providing excellent opportunities in Higher Education for the most able students regardless of social and educational disadvantage, by undertaking innovative world-leading research, and by leading innovation, enterprise and creative activities. World-class research and European integration are central to the University's vision as this is demonstrated in its strong showing in the UK's Research Assessment Exercise and its successful involvement in an extensive range of Framework Programme projects.



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The University's Durrell Institute of Conservation and Ecology (DICE) has an international reputation for biodiversity conservation using an interdisciplinary approach that integrates social and natural sciences and is part of the School of Anthropology & Conservation, ranked 10th in the UK in the **2011 Guardian University Guide**.

DICE is unique in its contribution to conservation across the globe. Conservation is not a traditional academic pursuit, it demands direct involvement to make positive change. DICE taught practitioners hold decision-making roles in some of the world's most innovative and successful conservation initiatives. An enduring collegiate network extends across disciplines, industries and cultures, reinforcing the application of best practice and speaking with clarity to multi-disciplined stakeholders. Applying a 360° learning approach, DICE adopts, augments and imparts knowledge amongst students, collaborators and partners. The Institute comprises a world-wide team, has projects running in 40 countries and provides first-hand experience from world experts in Europe, Africa, Asia and South America.

DICE was Britain's first research and training centre dedicated to the international conservation of biodiversity, habitats and ecosystems. In the latest national review of research quality among British universities, DICE research was overwhelmingly judged as world-leading or internationally excellent.

National Taiwan University

Yu-Pin Lin



The main entry to NTU. Photo: Yu-Pin Lin.

The **National Taiwan University** (NTU) is the oldest and most prestigious university of Taiwan. As an integrated university, NTU now has 1,972 full-time faculty members belonging to 54 departments and 103 graduate institutes. Many academic rankings of world universities have listed NTU as the best among numerous universities in China, Taiwan, and Hong Kong. The NTU team members involved in SCALES includes 9 faculty members in Departments of Bioenvironmental Systems Engineering, Forestry and Resource Conservation, Ecology and Evolutionary Biology, and Geography. The team has collected various biodiversity databases, developed spatial models of species distribution, and published many relevant papers in recent years. The major members of the NTU team are Drs. Yu-Pin Lin, Tzung-Su Ding, Hwa-Lung Yu, Chi-Ru Chang (Chinese Culture University), and Rita Yam.

The NTU team leader, professor Yu-Pin Lin, has research interests in application and development of geostatistical spatiotemporal methods, multi-scale analysis, quantitative methods in landscape ecology, watershed land use modelling, optimal monitoring sampling design, and eco-environmental modelling. He is also an associate editor of the journal *Environmental Monitoring and Assessment*, the chief managing editor of the journal *Paddy and Water Environment*, and editor of other international journals.

7. Conferences

SCALES Session on ecological fiscal transfers at Planet under Pressure Conference, 26-29 March 2012, London, Great Britain

Irene Ring

From 26 to 29 March 2012, the Earth System Science Partnership, consisting of the International Geosphere-Biosphere Programme, the World Climate Research Programme, DIVERSITAS – the international programme on biodiversity science and the International Human Dimensions Programme, organises the 2012 Global Change Open Science Conference in London titled "Planet under Pressure: new knowledge towards solutions". This is not just another scientific conference, but the organisers put much effort in making this a major event to link up scientists with policy makers, the business community, NGOs, the media and development agencies. The Planet under Pressure Conference will discuss solutions at all scales to move societies on to a sustainable pathway and will provide scientific leadership towards the Rio+20 United Nations Conference on Sustainable Development (UNCSD) in June 2012.

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SCALES WP4 will be present at this conference with a full session on “Financial instruments for local biodiversity action: thinking ecological fiscal transfers across scales”.

The SCALES session presents the status quo and options for ecological fiscal transfers across the globe and addresses researchers, NGOs, policy makers and administrators at all governmental levels that are in search of innovative fiscal instruments for local conservation policies. We will present SCALES results on the new Local Finances Law in Portugal (Santos et al. 2012), next to a newly developed SCALES paper on experiences with intergovernmental fiscal transfers for biodiversity conservation across Europe, building on inputs from France, Germany, Poland, Portugal, and Switzerland. European approaches in the session will be complemented by contributions from Brazil, the country with the longest-standing experience with ecological fiscal transfers, and Indonesia, where discussions on linking REDD+ implementation with intergovernmental fiscal transfers is on the way.

SANTOS, R., RING, I., ANTUNES, P., CLEMENTE, P. (2012) Fiscal transfers for biodiversity conservation: the Portuguese Local Finances Law. *Land use policy* 29(2): 261-273.

Links to SCALES session with day, time and presentations: http://www.planetunderpressure2012.net/pup_session.asp?19190
For more information about the PuP conference go to: <http://www.planetunderpressure2012.net/index.asp>

Maximum visibility of “SCALES” at the European Congress of Conservation Biology 28 August – 1 September 2012, Glasgow, Scotland

Guy Pe'er & Reinhard Klenke, Symposium organizers

The European Congress of Conservation Biology 2012 (ECCB2012) will be held at the Scottish Exhibition and Conference Centre in Glasgow from 28 August to 1 September 2012. With the theme of „Conservation on the Edge“, the congress will attempt to facilitate interaction and effective communication between researchers, policy makers, conservation practitioners and resource users.

We are happy to announce a 4-hour SCALES' symposium that will be held at the ECCB, entitled “The emergence of scales in conservation biology: toward better matching between conservation policy and the scales of ecological processes”. The goal of the symposium will be exchange knowledge and ideas on science and conservation of biodiversity across scales. Specifically the symposium aims: 1) to raise awareness to the critical need of considering scales in conservation research, management and policy design, in order to ensure that conservation efforts act cooperatively and synergistically and at appropriate scales; 2) to bring novel findings within the emerging field of understanding scales; and 3) to invoke a discussion on the future of conservation policy and management in Europe, considering the current mismatches in scale between conservation needs and actions.

With the idea of leading a discussion on an important emerging theme in biodiversity science and conservation, the symposium will offer a fresh view, and newest findings, from project SCALES and beyond. It will cover ecological, socio-economic and policy aspects of the topic, including issues of effective dissemination and working with uncertainty. We also left a room for non-SCALERS to present their work, so we hope that there is room for learning and surprises not only among non-SCALERS but also among SCALERS attending the symposium.

With a wide range of conservation relevant talks, a Pensoft-SCALES booth and an additional poster-session allocated to policy briefs, we believe that SCALES may be highly visible in the coming ECCB.

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For more information go to: <http://www.eccb2012.org/>