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Conservation needs to integrate knowledge across scales

To the Editor — Wyborn and Evans[1] argue that global priority maps for conservation have questionable utility and may crowd out local and more contextual research. While we agree with the authors' central argument that effective and equitable conservation must be rooted at local scales, the assertion that "conservation needs to break free from global priority mapping" presents a false dichotomy. We should not think in terms of a binary choice of methods (local or global), but rather recognize that information across scales will have the most relevance and power in the future. Wyborn and Evans challenge the creators of global maps to identify their theory of change. Here, we outline six major areas of contribution relevant for priority setting and other conservation-related decisions.

Broader context for local decisions

Making effective local policy relies on anticipating economic, political or environmental change operating at larger scales and understanding how it affects local social or biophysical conditions. Global maps reveal the importance of distant connections (also known as telecoupling) in driving change in nature and its contributions to people[2]. Similarly, species extinction risk is governed by how rare a species is, and a purely local focus cannot fully reveal the regional, continental and global landscape of extinction risks[3]. Analyses of linkages across scales from local to regional to global are essential for a full understanding of the impacts of policies or actions. Ignoring linkages across scales results in missed opportunities and unintended consequences.

Rapid information for globalized decision-making

In an increasingly interconnected world, many actors, including corporations, non-governmental organisations, development banks and supranational organizations such as the Convention on Biological Diversity (CBD), make decisions at a global or regional scale; without information on nature, they will (and do) proceed without it. Several global-scale maps and analyses[4–6] were cited by the CBD Subsidiary Body on Scientific, Technical and Technological Advice (CBD/SBSTTA/24/3/Add.2) that informed the content of

the Global Biodiversity Framework. Although all global agreements need to be operationalized at national and sub-national scales, global maps provide the basis to set agendas, inform target setting, provide pressure or leverage for governments and others to act, and in some cases provide information on the magnitude of financing required for implementation.

Understanding synergies and trade-offs across scales

Setting priorities only at local scales jeopardizes the protection of globally important species or ecosystems, and may lead to land or ocean use strategies that conflict with regional, national and international goals[7]. Spatial patterns and processes relevant at continental to global scales, such as global biogeographic patterns and areas of importance for multiple environmental goals[8], must be understood at that level to inform countries that share the responsibility towards conserving species and ecosystems with wide and cross-border distributions. Cooperation across regional, national or global scales, supported by large-scale studies, can create synergies or efficiencies that have the potential to improve outcomes for people and nature in all local areas[9].

Setting boundaries, baselines or hypotheses

Global analyses provide boundary conditions and identify biodiversity or ecosystem thresholds at the global and regional scales that can serve as input to the local scale[10]. Alternatively, global analyses of local data can identify local and regional differences in patterns and trends[11]. Global studies also provide a baseline of results at large scales that can be further refined with better data and local context (for example, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services Global Assessment[12], the Ocean Health Index[13] or mapping spatial conservation gaps for crop wild relatives[14]). Indeed, the gradual improvement of imperfect knowledge by challenging existing hypotheses is a fundamental element of the scientific process, which often produces more questions than it answers. While misapplication of priority maps beyond their envisioned scope is a valid concern, these

maps can form the basis for future research, not just conservation plans.

Identifying and supplementing gaps in knowledge

Global maps complement local information, which for many attributes of ecosystems is not readily available across much of the world. This is not an argument for supplanting local data with global data, but rather for filling gaps where needed or desired by local or other actors while local knowledge and data are still being acquired (as was done for the United Nations Convention to Combat Desertification framework for Land Degradation Neutrality[15]). Global maps can also identify knowledge gaps and redirect priorities towards obtaining that knowledge, and can facilitate the aggregation of local data to broader extents (from assembling local knowledge on climate change[16] and biodiversity change[17] to compiling local tracking data into a global atlas of ungulate migrations[18]).

Education, communication and inspiration

Global maps serve as an education and communication tool beyond decision-makers by readily making the global personal. Climate change research has demonstrated how global studies and maps can be an important tool for communicating a global problem in local contexts[19]. Global maps of the origin of food crops have made their way into classrooms and the popular imagination, elucidating connections between countries[20].

Wyborn and Evans argue that global maps have proliferated beyond their usefulness, and that the current deluge has not found its way into decisions. We agree that uptake of scientific information has often been limited, but this is not unique to global efforts. Decisions are taken — and can impact people — at a variety of scales. Identifying the key leverage points for information to support intervention and the key actors involved is more likely to result in uptake than selecting any one scale over another.

Amplifying local voices and values is critical to producing just and sustainable outcomes for nature and people. But this does not preclude large-scale efforts or mean

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we should stop generating information at the global scale — or any scale. Successful conservation efforts will require integration across multiple scales and multiple types of knowledge. Rather than pitting one approach against another, we must seek better ways of integrating a wide diversity of perspectives across scales to address the challenges ahead. ❐

Rebecca Chaplin-Kramer [1,2] ✉,
Kate A. Brauman [2],
Jeannine Cavender-Bares [3],
Sandra Díaz [4], Gabriela Teixeira Duarte [5],
Brian J. Enquist [6,7], Lucas A. Garibaldi [8,9],
Jonas Geldmann [10],
Benjamin S. Halpern [11,12],
Thomas W. Hertel [13], Colin K. Khoury [14,15],
Joana Madeira Krieger [5],
Sandra Lavorel [16], Thomas Mueller [17,18],
Rachel A. Neugarten [19],
Jesús Pinto-Ledezma [3],
Stephen Polasky [3,20],
Andy Purvis [21,22], Victoria Reyes-García [23],
Patrick R. Roehrdanz [24],
Lynne J. Shannon [25], M. Rebecca Shaw [26],
Bernardo B. N. Strassburg [5,27],
Jason M. Tylianakis [28], Peter H. Verburg [29],
Piero Visconti [30] and Noelia Zafra-Calvo [31]

[1]Natural Capital Project, Woods Institute on the Environment, Stanford University, Stanford, CA, USA. [2]Institute on the Environment, University of Minnesota, Saint Paul, MN, USA. [3]Department of Ecology, Evolution and Behavior, University of Minnesota, Saint Paul, MN, USA. [4]Instituto Multidisciplinario de Biología Vegetal (IMBIV), CONICET and FCEFyN, Universidad Nacional de Córdoba, Córdoba, Argentina. [5]International Institute for Sustainability, Rio de Janeiro, Brazil. [6]Department of Ecology and Evolutionary Biology, University of Arizona, Tucson, AZ, USA. [7]Santa Fe Institute, 1399 Hyde Park Rd., Santa Fe, NM, USA. [8]Universidad Nacional de Río Negro, Instituto de Investigaciones en Recursos Naturales, Agroecología y Desarrollo Rural, Río Negro, Argentina. [9]Consejo Nacional de Investigaciones Científicas y Técnicas, Instituto de Investigaciones en Recursos Naturales, Agroecología y Desarrollo Rural, Río Negro, Argentina. [10]Center for Macroecology, Evolution and Climate, Globe Institute, University of Copenhagen, Copenhagen, Denmark. [11]National Center for Ecological Analysis and Synthesis, University of California, Santa Barbara, CA, USA. [12]Bren School of Environmental Science and Management, University of California, Santa Barbara, CA, USA. [13]Agricultural Economics, Purdue University, West Layfayette, IN, USA. [14]San Diego Botanic Garden, Encinitas, CA, USA. [15]International Center for Tropical Agriculture (CIAT), Cali, Colombia. [16]Laboratoire d'Ecologie Alpine, Univeristé Grenoble Alpes - CNRS - Universtté Savoie-Mt Blanc, Grenoble, France. [17]Senckenberg Biodiversity and Climate Research Centre, Senckenberg Gesellschaft fuer Naturforschung, Frankfurt (Main), Germany. [18]Department of Biological Sciences, Goethe University Frankfurt, Frankfurt (Main), Germany. [19]Department of Natural Resources and the Environment, Cornell University, Ithaca, NY, USA. [20]Department of Applied Economics, University of Minnesota, Saint Paul, MN, USA. [21]Department of Life Sciences, Natural History Museum, London, UK. [22]Institució Catalana de Recerca i Estudis Avançats (ICREA), Barcelona, Spain. [23]Institut de Ciència i Tecnologia Ambientals, Universitat Autònoma de Barcelona (ICTA-UAB), Cerdanyola del Vallès, Barcelona, Spain. [24]Moore Center for Science, Conservation International, Arlington, VA, USA. [25]Department of Biological Sciences, University of Cape Town, Cape Town, South Africa. [26]Global Science, World Wide Fund for Nature (WWF), San Francisco, CA, USA. [27]Rio Conservation and Sustainability Science Centre, Department of Geography and the Environment, Rio de Janeiro, Brazil. [28]Bioprotection Aotearoa, School of Biological Sciences, University of Canterbury, Christchurch, New Zealand. [29]Institute for Environmental Studies, VU University Amsterdam, Amsterdam, Netherlands. [30]IIASA - International Institute for Applied Systems Analysis, Laxenburg, Austria. [31]Basque Centre for Climate Change bc3, Scientific Campus of the University of the Basque Country, Biscay, Spain.
✉e-mail: bchaplin@stanford.edu

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Competing interests

The authors declare no competing interests.

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