



UNESCO-MAB Biosphere Reserves already deal with ecosystem services and sustainable development

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Xu et al. (1) make a most useful contribution to the debate on protected areas (PAs) in China and make a welcome focus on ecosystem services rather than threatened species. Nonetheless, their continued focus is on the establishment of PAs, rather than wider landscape-scale approaches, which are more suitable to the Agenda 2030 and Sustainable Development Goals. In particular, they say, "First, there is no PA type particular to ecosystem services conservation and directly aimed at enhancing ecological security for human beings. Nature reserves are established primarily for biodiversity conservation, not for ecosystem services. Second, important areas for conservation of biodiversity and of different ecosystem services do not always match well. Many places important for ecosystem services are not important for biodiversity conservation."

These assertions need to be challenged for several reasons. United Nations Educational, Scientific and Cultural Organization (UNESCO) Biosphere Reserves are established directly to bring together biodiversity, cultural diversity, and ecosystem services, thus promoting ecological security and models for sustainable development. China has a good strong Man and Biosphere (MAB) Program with a network of 33 Biosphere Reserves (created between 1979 and 2015), yet the article does not touch on this at all.

It is true that, in 1994, International Union for Conservation of Nature (IUCN) removed Biosphere Reserves (and World Heritage Sites) as specific PA categories. However, in the Lima Action Plan (2) of 2016, adopted by the International Co-ordinating Council of UNESCO-MAB Program, there is considerable

emphasis on ecosystem services and people, rather than flagship species or the like. The Lima Action Plan has as its Outcome A2 "Biosphere Reserves recognized as sources and stewards of ecosystem services." It also notes that "the MAB Programme will concentrate its support to Member States and stakeholders in conserving biodiversity, restoring and enhancing ecosystem services, and fostering the sustainable use of natural resources; contributing to sustainable, healthy, and equitable societies, economies and thriving human settlements in harmony with the biosphere; facilitating biodiversity and sustainability science, education for sustainable development and capacity building; and supporting mitigation and adaptation to climate change and other aspects of global environmental change."

This suggests that there is no need, as Xu et al. propose, "to create a new category of PAs for sustaining the provision of ecosystem services for human well-being"—such a category already exists in the form of Biosphere Reserves. What is needed is for IUCN and UNESCO member nations to use the Biosphere Reserves in a more agile fashion, following the vision of the MAB Program of "a world where people are conscious of their common future and interaction with our planet, and act collectively and responsibly to build thriving societies in harmony with the biosphere." A mechanism by which the zones of any Biosphere Reserve would be equated to appropriate IUCN PA categories can help solve this issue (3). Bringing together the strengths of existing systems, rather than creating a new category (surely a route to policy confusion), would be the most profitable way forward.

1 Xu W, et al. (2017) Strengthening protected areas for biodiversity and ecosystem services in China. *Proc Natl Acad Sci USA* 114:1601–1606.

2 UNESCO (2016) *Lima Action Plan for UNESCO's Man and the Biosphere (MAB) Programme and Its World Network of Biosphere Reserves (2016–2025)*. Available at www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/SC/pdf/Lima_Action_Plan_en_final_01.pdf. Accessed January 17, 2017.

3 Bridgewater P, et al. (1996) *Biosphere Reserves and the IUCN System of Protected Area Management Categories* (ANCA, IUCN, and UNESCO-MAB, Canberra, ACT, Australia).

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The authors declare no conflict of interest.

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