

with a diverse community of both savannah and forest adapted species. These enclaves are coveted by large-scale agriculture, particularly in the southern Brazilian Amazon, which has the highest deforestation rates in the country. During February 2017–February 2019 we conducted extensive surveys in this region, including in Campos Amazônicos National Park, which was created in 2006 to protect the largest Amazonian savannah enclave (434,200 ha) in the southern Brazilian Amazon. Within this enclave, during the dry season, we recorded a single adult crowned solitary eagle at 61.818 °W 8.478 °S, at least 600 km outside the species' known range. The record reported here is the most northerly known record of the species. Although unexpected because of the distance from documented populations, the area has large tracts of natural open habitats similar to those used by the crowned solitary eagle elsewhere.

Even though eagles have high dispersal capabilities, the great distance from other known populations suggests that this record is not a dispersing individual. However, further studies are needed to confirm whether there is a resident population within this savannah enclave. As documented for species elsewhere (Hody & Kays, 2018, *ZooKeys*, 759, 81–97), it is possible that the crowned solitary eagle is expanding its distribution northward, following substantial landscape transformation in this region from Amazonian forest to open areas for extensive cattle ranching. A number of recent records from extensive cattle-ranching areas (Bird-Life International, 2016) suggests that the species is capable of tolerating disturbances associated with this anthropogenic habitat, although the species is persecuted by ranchers (Barbar et al., 2016, *Journal of Raptor Research*, 50, 115–121).

The existence of a resident population or pioneer colonists of the crowned solitary eagle would be good news both for the species and for Campos Amazônicos National Park, which faces severe challenges to the maintenance of its integrity, with various infrastructure projects planned or ongoing nearby, including roads, hydroelectric dams and mining. The presence of the crowned solitary eagle emphasizes the biodiversity value of this poorly studied region.

DANIEL G. ROCHA (orcid.org/0000-0002-0100-3102)
Department of Wildlife, Fish, and Conservation Biology,
University of California, Davis, California, USA, and Grupo
de Pesquisa em Ecologia e Conservação de Felinos na
Amazônia, Instituto de Desenvolvimento Sustentável
Mamirauá, Tefé, Brazil
E-mail rochadg.bio@gmail.com

LAURIE HEDGES Oxford, UK

BRUNO C. CAMBRAIA Parque Nacional dos Campos
Amazônicos, Instituto Chico Mendes de Conservação
da Biodiversidade, Porto Velho, Brazil

The ecosystems of large unregulated rivers of Central Europe are under pressure

A social campaign has been organized in Poland against the international inland waterway E-40 (Ogólnopolskie Towarzystwo Ochrony Ptaków, 2019, otop.org.pl/nasze-projekty/pilnujemy/stop-dla-drogi-wodnej-e40), which will be constructed through Poland, Belarus and Ukraine, stimulated by a December 2018 report (Grygoruk et al., 2018, ratujmyrzeki.pl/dokumenty/E40_raport_2019.pdf). The construction of the waterway would connect the ports of Gdansk on the Baltic Sea in Poland and Kherson on the Black Sea in Ukraine, and would include parts of the Vistula, Bug, Pina, Prypec and Dnieper rivers. The plan for the E-40 waterway is a threat to the ecosystems of some of the largest and unregulated rivers of Poland and wider Europe. A development strategy for inland waterways was introduced in 2016 to adapt Poland's rivers to the criteria of international standards for inland waterways (Świerczewska-Pietras, 2018, *Prace Komisji Geografii Przemysłu Polskiego Towarzystwa Geograficznego*, 32, 38–53.). In addition, the act relating to Poland's ratification of the European Agreement on Main Inland Waterways of International Importance came into force in February 2017 (Lawicki et al., 2017, *Oryx*, 51, 397–397).

The construction of this Baltic–Black Sea waterway would affect many European rivers, especially in Poland, with the strongest impact on the Bug and Vistula. The plans include the construction of an artificial channel to connect the Bug and Vistula Rivers, which would be the main source of water for this channel. The construction of the channel would have an impact on important river valleys, including Tysmienica and Wilga, and the main impact would be the water required for operating the channel. This would particularly affect the Bug, which is unregulated along its entire length. The duration of river floods would be reduced by c. 20% and the frequency of severe droughts in the nearby area would increase (Grygoruk et al., 2018, op. cit.). The exploitation of the channel, and particularly the operation of its floodgates, would significantly reduce the levels of groundwater in most adjacent areas (Grygoruk et al., 2018, op. cit.). The fall in the water level of the Bug would diminish its ability to self-purify industrial and municipal sewage that comes from Ukraine (Starodubet et al., 2018, *Remote Sensing for Agriculture, Ecosystems, and Hydrology XX*, 107830P, published online 10 October 2018).

Almost all of the planned length of the E-40 in Poland passes through protected areas and it is estimated that the inland waterway would have an impact on 1,064 km² of these areas, including 12 Natura 2000 areas, one national park, four landscape parks and 23 nature reserves. Important animal species are also threatened: Eurasian oystercatcher *Haematopus ostralegus* (IUCN, NT), black-tailed godwit *Limosa limosa* (IUCN, NT), Eurasian otter *Lutra lutra* (IUCN, NT), common ringed plover *Charadrius hiaticula*

(IUCN, LC), Mediterranean gull *Larus melanocephalus* (IUCN, LC), and aquatic warbler *Acrocephalus paludicola* (IUCN, VU). The construction of the planned inland waterway could also result in a reduction of tourism and a consequent loss of income for local people.

GRZEGORZ GRZYWACZEWSKI (✉ orcid.org/0000-0003-1136-0768) University of Life Sciences, Lublin, Poland
E-mail grzegorz.grzywaczewski@up.lublin.pl

IGNACY KITOWSKI The State School of Higher Education, Chełm, Poland

Conserving African biosphere reserves: a workshop on the valuation of ecosystem services in Man and the Biosphere Reserves

In Bahir Dar, Ethiopia, on the shores of Lake Tana, a workshop for the valuation of ecosystem services in Man and the Biosphere Reserves was held on 13–17 May 2019. ‘Evamab’ is a 3-year research project funded by the Belgian Science Policy under an agreement with UNESCO’s Man and the Biosphere programme, carried out by a consortium of Belgian and African research institutes and universities. The project aims to understand, apply and improve approaches for ecosystem services assessment in African Man and the Biosphere Reserves. It focuses on four Reserves, in Benin (Pendjari), Ethiopia (Lake Tana), Tanzania (Lake Manyara) and Uganda (Mount Elgon), reflecting a range of socio-ecological and biogeographical conditions, including savannah, Afro-montane and lacustrine systems, all of which are undergoing rapid anthropogenic changes.

Managing Biosphere Reserves requires socially and scientifically pertinent and robust approaches, especially in weak institutional contexts. The ecosystem services concept connects the programme’s goals, activities and the associated stakeholders at local and global levels. Existing ecosystem services assessment tools have been categorized based on user-generated criteria collected through an iterative Delphi survey at the 2017 African Man and the Biosphere Reserves Network Meeting in Nigeria. A selection of tools for rapid assessment of ecosystem services has been tested and customized in the field. The interdisciplinary and cross-cultural approach to using and evaluating assessment tools allowed us to learn about the opportunities and pitfalls associated with the valuation of ecosystem services and informed the preparation of decision-support tools for a range of stakeholders in research, policy and practice.

During the workshop, c. 40 participants (Biosphere Reserve managers, scientists and policy makers) contributed to the design and contents of a UNESCO *Manual for Management Based on Ecosystem Services in African Man and Biosphere Reserves*. A participatory approach combining World Café (i.e. rotating tables) workshops, consensus building discussions and the sharing of field-based experiences in the four case studies and beyond was conducive to collecting

expert input. The final version of the manual is due in January 2020, and a first draft is scheduled to be presented at the 2019 African Man and the Biosphere Reserves Meeting in Abidjan, Côte d’Ivoire, the 2019 Ecosystem Services Partnership World Conference in Hannover, Germany, and the 2020 IUCN Congress in Marseille, France. The participants agreed on a co-stewardship and research-based approach in the management of Biosphere Reserves, and the manual and derived products should appeal to both managers and decision makers. In the workshop, the opportunities of using ecosystem services as a tool were illustrated by payment for ecosystem services initiatives in Uganda, community-based workshops held in Benin, Uganda and Tanzania, and willingness-to-pay studies conducted among communities surrounding Lake Tana and Pendjari Biosphere Reserves.

The valuation of ecosystem services in Man and the Biosphere Reserves ‘Evamab’ project aims to connect local managers and communities—who are the ultimate stewards of their social-ecological systems—and global beneficiaries of large-scale ecosystem services, such as carbon storage and climate stability, to the realities of the day-to-day management of African Biosphere Reserves. During a field trip on Lake Tana, participants experienced first-hand the challenge of the rapid expansion of the invasive, non-native water hyacinth *Eichhornia crassipes*, which locally hampers fisheries and livelihoods. A visit to a local Christian Orthodox monastery illustrated the importance of ancestral culture as a local ecosystem service (tourism revenues and conservation of sacred groves). Project updates are posted on the project website (biodiv.be/evamab) on a regular basis.

LUC JANSSENS DE BISTHOVEN (✉ orcid.org/0000-0002-9547-1563) and ANNE-JULIE ROCHETTE and ERIK VERHEYEN Royal Belgian Institute of Natural Sciences, Brussels, Belgium
E-mail ljanssens@naturalsciences.be

TEWOGBADE JEAN-DIDIER AKPONA Université d’Abomey-Calavi, Cotonou, Bénin

BRUNO VERBIST and KOEN VANDERHAEGEN Katholieke Universiteit Leuven, Leuven, Belgium

ZERUBABEELI NATURINDA Busitema University, Uganda

STEVEN VAN PASSEL Universiteit Antwerpen, Antwerp, Belgium

DAREGOT BERIHUN Bahir Dar University, Bahir Dar, Ethiopia

LINUS MUNISHI Nelson Mandela African Institution of Science and Technology, Arusha, Tanzania

JEAN HUGÉ Université Libre de Bruxelles, Brussels, Belgium; Hasselt University, Hasselt, Belgium; and Royal Belgian Institute of Natural Sciences, Brussels, Belgium