# Meeting biodiversity, climate, and water objectives through integrated strategies

August 23 2021

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We are collectively failing to conserve the world's biodiversity and to mobilize natural solutions to help curb global warming. A new study carried out by the Nature Map Consortium shows that managing a

strategically placed 30% of land for conservation could safeguard 70% of all considered terrestrial plant and vertebrate animal species, while simultaneously conserving more than 62% of the world's above and below ground vulnerable carbon, and 68% of all clean water.

In November, governments will convene in Glasgow under the UN Framework Convention on Climate Change. Natural climate solutions for mitigation and adaptation will be high on the agenda, as illustrated by the recent G7 Nature Compact and the Leaders' Pledge for Nature signed by 88 heads of government. In 2022, China will host the Conference of the Parties to the UN Convention on Biological Diversity to agree a new Global Biodiversity Framework, including proposed targets to conserve at least 30% of land and the ocean by 2030 and to apply integrated biodiversity-inclusive spatial planning to address land- and sea-use change.

To stop the decline of nature and meet the Paris Agreement objectives, strategies need to be designed and implemented for better managing land use for agriculture, infrastructure, biodiversity conservation, climate change mitigation and adaptation, water provision, and other needs. As underscored by the draft Global Biodiversity Framework and current efforts in Costa Rica, China, and other countries, this requires spatial planning to assess where biodiversity conservation would bring the greatest benefits to other policy objectives.

To support such integrated strategies, a paper by the Nature Map consortium just published in the journal *Nature Ecology and Evolution* presents an approach for spatial planning. The paper set out to determine areas of global importance to manage for conservation to simultaneously protect the greatest number of species from extinction, conserve vulnerable terrestrial carbon stocks, and safeguard freshwater resources. This effort is the first of its kind to truly integrate biodiversity, carbon, and water conservation within a common approach and a single global

priority map. Another distinct novelty of the work is the consideration of a comprehensive set of plant distribution data (about 41% of all plant species) in the analyses, and the setting of species targets for extinction risk.

"To implement post-2020 biodiversity strategies such as the Global Biodiversity Framework, policymakers and governments need clarity on where resources and conservation management could bring the greatest potential benefits to biodiversity. At the same time, biodiversity should not be looked at in isolation. Other aspects such as conserving carbon stocks within natural ecosystems should be considered alongside biodiversity, so that synergies and trade-offs can be evaluated when pursuing multiple objectives," explains lead author Martin Jung, a researcher in the IIASA Biodiversity, Ecology, and Conservation Research Group.

"The new global priority maps developed as part of the study show that when it comes to identifying new areas to manage for conservation, such as protected areas or community-managed forests, quality (location and management effectiveness) is more important than quantity (global extent). To aim for quality of conservation and achieve the goal of safeguarding biodiversity, government and non-government agencies should be setting objectives and indicators for what they want: conserving species, healthy ecosystems and their services to people, and identify areas to conserve accordingly. Our study provides guidance on how to do that," adds study coauthor Piero Visconti who leads the Biodiversity, Ecology, and Conservation Research Group at IIASA.

The researchers note that conserving a strategically located 30% of land could yield major gains for conservation, climate, and water provisioning. Specifically, it would safeguard more than 62% of the world's above and below ground vulnerable carbon and 68% of all fresh water, while ensuring that over 70% of all terrestrial vertebrate and plant

species are not threatened with extinction. As the work shows, meeting these objectives will require strategic placement of conservation interventions using spatial planning tools like Nature Map and, crucially, require enabling their stewards to effectively manage these areas.

"This type of approach can support decision makers in prioritizing locations for conservation efforts, and shows just how much both people and nature could gain. To be successful long-term, these areas must be managed effectively and equitably. That includes respecting the rights of, and empowering indigenous peoples and local communities," says co-author Lera Miles, Principal Technical Specialist—Planning for Places, UN Environment Programme World Conservation Monitoring Centre (UNEP-WCMC).

"Maps for integrated spatial planning, as called for in the draft Global Biodiversity Framework, are necessary for meeting climate and biodiversity objectives. They are also critical for financing natural climate solutions, improving carbon markets, and greening supply chains," says Guido Schmidt-Traub, an author of the paper who has also written a related commentary in the same issue of *Nature Ecology and Evolution*.

The study demonstrates that optimizing jointly for biodiversity, carbon, and water maximizes synergies that can be gained from conservation compared to placing emphasis on any individual asset alone. Through strategic action in selected locations, significant benefits can be achieved across all three dimensions. Conservation efforts however need to be greatly scaled-up by all actors in society to meet global biodiversity and climate objectives.

Jung points out that the analysis identifies the upper potential value of any given area to be managed for conservation at global scale. The team by no means suggests or implies that all areas with high value are to be

placed under strict protection, recognizing that these management choices are decided by national and local stakeholders.

The team's analyses also quantitatively confirm many areas earlier described as biodiversity hotspots, which were previously based on expert opinion alone. By including selected data of the global tree of life that have so far been ignored in global prioritizations—such as reptiles and plants—the team identified new areas to be considered as important for biodiversity at a global scale. These include, for instance, the southeastern United States and the Balkans. The research has also been useful in updating and improving the information on all areas of global importance for biodiversity conservation.

"Our methods, data, and the global priority maps are meant to be used as a decision support tool for major conservation initiatives. Furthermore, the study lays the groundwork for a new generation of integrated prioritizations and planning exercises that all actors can use to inform conservation choices at the regional, national and sub-national levels," Jung concludes.

The global priority maps can be explored interactively on the UN Biodiversity lab to support decision makers and generate insight and impact for conservation and sustainable development.

**More information:** Areas of global importance for conserving terrestrial biodiversity, carbon and water, *Nature Ecology and Evolution* (2021). DOI: 10.1038/s41559-021-01528-7 , www.nature.com/articles/s41559-021-01528-7

Provided by International Institute for Applied Systems Analysis