

Ensuring Nature-based Solutions support both biodiversity and climate change adaptation



naturebasedsolutionsinitiative.org

Challenge

To better understand the biodiversity outcomes of NbS implemented for climate change adaptation. Although nature-based solutions (NbS) should by definition support biodiversity, not all projects framed as NbS have been shown to achieve this in practice. Badly designed projects might fail to deliver the intended benefits or could even harm biodiversity, meaning that they are not resilient to future change.

Solution

Research, practice and policy communities need to work together to improve the design, monitoring and management of NbS so that they deliver clear benefits for biodiversity and ecosystem health alongside climate goals.

Recommendations for policymakers

- 1** Ensure that nature-based climate policy always explicitly supports biodiversity and ecosystem health.
- 2** Design targets for NbS commitments, including within NDCs, that cover a wide range of aspects of ecosystem health, rather than using simplistic targets such as forest extent or measuring single benefits such as carbon storage.
- 3** Initiate transformative change across sectors to address direct and indirect drivers of biodiversity loss which is essential for NbS sustainability.



1 million



The number of species forecast to go extinct due to human activities, many within decades.¹

67%



The average increase in species richness (number of plant or animal species) associated with the implementation of nature-based solutions for climate change adaptation.²

71%

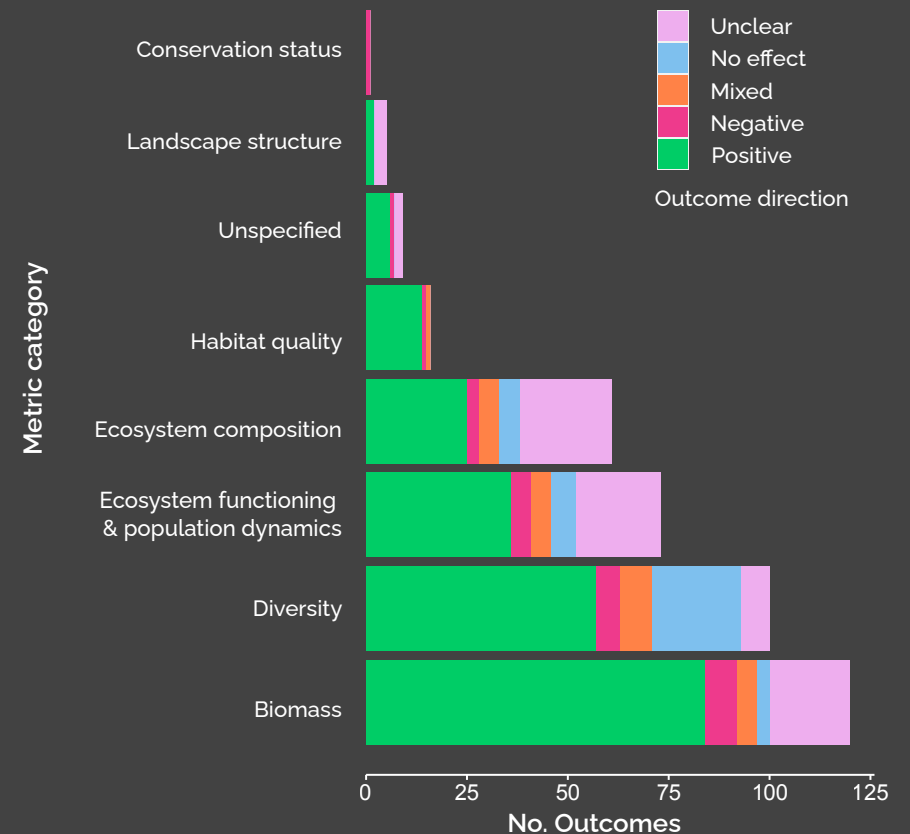


The proportion of studies that only measured one or two aspects of biodiversity and ecosystem health, highlighting the need for improved evidence.²

Summary

Can nature-based solutions deliver a win-win for biodiversity and climate change adaptation?

Nature-based solutions (NbS) can and should be able to tackle both the climate and biodiversity crises, and these aims are interdependent. Both rely on the capacity of NbS to support and enhance the health of an ecosystem, including its biodiversity, the condition of its soil and water, and its capacity to maintain its functions despite environmental change. However, while research has helped to improve our understanding of how nature-based interventions for climate change mitigation affect ecosystem health, we still do not understand the outcomes of interventions aimed at addressing climate change adaptation. To address this, we systematically reviewed the outcomes of 109 nature-based interventions for climate change adaptation for 33 different indicators of ecosystem health.²



Reviewed outcomes of nature-based interventions for different categories of ecosystem health metric

Key findings

- 1** Most interventions with positive outcomes for climate change adaptation also reported measurable benefits for ecosystem health.
- 2** An average increase of 67% in local species richness (the number of species observed in the intervention area) is associated with nature-based interventions to address climate impacts.
- 3** All of the eight interventions that reported benefits for both climate change mitigation and adaptation also supported ecosystem health, leading to a triple win.
- 4** There was evidence of trade-offs between outcomes for climate and biodiversity, mainly resulting from interventions involving forest management and creation of novel ecosystems such as monoculture plantations of non-native species.
- 5** Most (71%) of interventions were assessed using just one or two types of ecosystem health metric. There was also a strong bias towards measuring outcomes for plant species (67% of outcomes assessed plants alone), and in the majority of cases (57% of outcomes for which it was relevant) it was unclear whether the species studied were native or non-native. This means that some interventions might have negative impacts (e.g. for animal species) that are not being observed or reported.

Improving understanding of ecosystem health outcomes of NbS

- Assess the impacts of NbS on a broader suite of ecosystem health outcomes, such as species diversity; ecosystem functions such as biomass production and pollination; connectivity of habitat patches; and soil and water quality.
- Assess the effect of NbS on a greater range of taxa (e.g. different types of plants, animals and fungi).
- Account for whether species are native to an area (and thus support local biodiversity) and whether ecosystems will be resilient to future environmental change, when assessing the ecosystem health outcomes of NbS.
- Develop improved methodologies that enable accurate, simple, cost-effective and replicable assessments of ecosystem health (e.g. using remote sensing, camera traps, environmental sensors and citizen science). Use a participatory approach that incorporates local and traditional knowledge.
- These actions will help identify hidden adverse effects on ecosystem health, and show how interventions can be designed to support biodiverse, resilient ecosystems which continue to provide societal benefits in the long term.



Delivering better ecosystem health outcomes of NbS

- Widen awareness that NbS must be explicitly designed to deliver benefits for biodiversity and ecosystem health, as these are fundamental properties of NbS that are essential for their effectiveness and long-term resilience.
- Incorporate comprehensive ecosystem health and biodiversity targets in NbS plans from the project level to national and international policy.
- Deepen understanding of how different aspects of ecosystem health relate to ecosystem functioning and provision of ecosystem services, including those needed for climate change adaptation and mitigation.
- Increase funding for research and monitoring of ecosystem health as well as directing investments towards well-designed projects that support ecosystem health and meet the IUCN Global Standard for NbS.

Recommendations for policymakers

Ensure that nature-based climate policy explicitly supports biodiversity and ecosystem health, including by incorporating strong biodiversity targets and safeguards in policy documents such as NDCs. Similarly, explore opportunities for biodiversity conservation to deliver on climate goals.

Design targets and monitoring strategies for NbS commitments that cover a wide range of aspects of ecosystem health, rather than using simplistic targets such as forest extent, and measuring single benefits such as just carbon storage or changes in the number of species.

Initiate transformative change across sectors to address direct and indirect drivers of biodiversity loss, which will in turn support the success of NbS, including cutting greenhouse gas emissions, eradicating damaging subsidies, and eliminating environmental harm from supply chains.

Recommendations for practitioners

Collaborate with ecologists and local communities to ensure that projects are designed from the outset to provide benefits for ecosystem health alongside other societal challenges, setting targets and monitoring the impacts of interventions on a range of aspects of ecosystem health over time.

Use the latest evidence on implementation methods that are most likely to produce win-wins for biodiversity and climate goals, referring to resources such as Conservation Evidence ([conservationevidence.com](https://www.conservationevidence.com)) and the Nature-based Solutions Evidence Tool (naturebasedsolutionsevidence.info)

Draw on local knowledge to inform NbS planning to complement the published evidence base.

Follow the IUCN Global Standard for NbS to ensure that projects meet the criteria to qualify as an NbS and to identify ways of improving



References

¹IPBES (2019): *Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services*. S. Díaz, J. Settele, E. S. Brondízio E.S., H. T. Ngo, M. Guèze, J. Agard, A. Arneth, P. Balvanera, K. A. Brauman, S. H. M. Butchart, K. M. A. Chan, L. A. Garibaldi, K. Ichii, J. Liu, S. M. Subramanian, G. F. Midgley, P. Miloslavich, Z. Molnár, D. Obura, A. Pfaff, S. Polasky, A. Purvis, J. Razzaque, B. Reyers, R. Roy Chowdhury, Y. J. Shin, I. J. Visseren-Hamakers, K. J. Willis, and C. N. Zayas (eds.). IPBES secretariat, Bonn, Germany. 56 pages.

This briefing is based on the findings of:

²Key, I., Smith, A., Turner, B., Chausson, A., Girardin, C., MacGillivray, M., Seddon, N. (2021). [Can nature-based solutions deliver a win-win for biodiversity and climate change adaptation?](#) Preprints 2021, 2021100336 (doi: 10.20944/preprints202110.0336.v1)

Icons are copyright of Paula Madrid, Kristina Margaryan & Alvaro Cabrera from the [Noun Project](#)

