

Reporting Summary

Nature Portfolio wishes to improve the reproducibility of the work that we publish. This form provides structure for consistency and transparency in reporting. For further information on Nature Portfolio policies, see our [Editorial Policies](#) and the [Editorial Policy Checklist](#).

Statistics

For all statistical analyses, confirm that the following items are present in the figure legend, table legend, main text, or Methods section.

n/a Confirmed

- | | | |
|-------------------------------------|-------------------------------------|--|
| ☒ | ☒ | The exact sample size (n) for each experimental group/condition, given as a discrete number and unit of measurement |
| ☒ | ☐ | A statement on whether measurements were taken from distinct samples or whether the same sample was measured repeatedly |
| ☒ | ☐ | The statistical test(s) used AND whether they are one- or two-sided
<i>Only common tests should be described solely by name; describe more complex techniques in the Methods section.</i> |
| ☒ | ☐ | A description of all covariates tested |
| ☐ | ☒ | A description of any assumptions or corrections, such as tests of normality and adjustment for multiple comparisons |
| ☒ | ☐ | A full description of the statistical parameters including central tendency (e.g. means) or other basic estimates (e.g. regression coefficient) AND variation (e.g. standard deviation) or associated estimates of uncertainty (e.g. confidence intervals) |
| ☒ | ☐ | For null hypothesis testing, the test statistic (e.g. F , t , r) with confidence intervals, effect sizes, degrees of freedom and P value noted
<i>Give P values as exact values whenever suitable.</i> |
| ☒ | ☐ | For Bayesian analysis, information on the choice of priors and Markov chain Monte Carlo settings |
| ☒ | ☐ | For hierarchical and complex designs, identification of the appropriate level for tests and full reporting of outcomes |
| ☒ | ☐ | Estimates of effect sizes (e.g. Cohen's d , Pearson's r), indicating how they were calculated |

Our web collection on [statistics for biologists](#) contains articles on many of the points above.

Software and code

Policy information about [availability of computer code](#)

Data collection No software was used.

Data analysis No software was used.

For manuscripts utilizing custom algorithms or software that are central to the research but not yet described in published literature, software must be made available to editors and reviewers. We strongly encourage code deposition in a community repository (e.g. GitHub). See the Nature Portfolio [guidelines for submitting code & software](#) for further information.

Data

Policy information about [availability of data](#)

All manuscripts must include a [data availability statement](#). This statement should provide the following information, where applicable:

- Accession codes, unique identifiers, or web links for publicly available datasets
- A description of any restrictions on data availability
- For clinical datasets or third party data, please ensure that the statement adheres to our [policy](#)

The data that support the findings of this study are available in Supplementary Data 1.

Human research participants

Policy information about [studies involving human research participants and Sex and Gender in Research.](#)

Reporting on sex and gender Gender was based on self-reporting. Four were women, and four were men.

Population characteristics Age of the women: 33, 33, 37 and 58 years. Age of the men: 40, 42, 55 and 70 years.

Recruitment Informed consent was obtained. No compensation was provided.

Ethics oversight N/A

Note that full information on the approval of the study protocol must also be provided in the manuscript.

Field-specific reporting

Please select the one below that is the best fit for your research. If you are not sure, read the appropriate sections before making your selection.

☐ Life sciences ☐ Behavioural & social sciences ☒ Ecological, evolutionary & environmental sciences

For a reference copy of the document with all sections, see nature.com/documents/nr-reporting-summary-flat.pdf

Ecological, evolutionary & environmental sciences study design

All studies must disclose on these points even when the disclosure is negative.

Study description

To examine the extent to which the agreed indicators for the Kunming Montreal Global Biodiversity Framework (GBF) are amenable to involvement of local stakeholders in their monitoring, we mapped different monitoring types onto the indicators of the GBF.

For each indicator, we assessed if it could be measured: (1) by IP, LC and citizen scientists who set up the monitoring programs and undertake the whole monitoring process, from design, to data collection, to analysis, and finally to use of data for management decisions on their own without any involvement of professional scientists and governmental statistical organizations ("autonomous local programs"; our Type A programs, based on: Danielsen, F. et al. *Conserv. Lett.* 7, 12-24; 2014); (2) by IP, LC and citizen scientists who collect, process, and interpret the data and present findings to indicator initiators or decision makers based on an original initiative to set up monitoring initiated by local stakeholders in collaboration with outsiders and where local stakeholders ask questions, identify priorities, and design the systems ("community-based monitoring programs"; our Type B); (3) by professional scientists and governmental statistical organizations with involvement of IP, LC and citizen scientists as data collectors ("contributory citizen science programs"; our Types C-D); or (4) by professional scientists and governmental statistical organizations without involving IP, LC and citizen scientists (our Type E). The criteria are not mutually exclusive, and some indicators received multiple scores.

For every indicator, we also assessed the main constraints, if any, to the involvement of IP, LC and citizen scientists: (1) Requires area-based or remote sensing-based data; (2) Requires a national or supranational overview; (3) Requires knowledge of administrative, legislative, policy, regulatory, or managerial aspects; (4) Requires data from museums or herbaria; or (5) Difficult to monitor technically or analytically.

Then we determined for each indicator whether we knew of specific examples of monitoring programs in which the indicator had been populated with data, as a measure of our certainty in the coding assigned.

Assignment of monitoring scheme types to indicators was undertaken independently by Neil D. Burgess and Finn Danielsen. Where we disagreed, consensus was reached through discussion (data in Supplementary Information).

For validation, we also asked eight experts from across the world to complete a random spot test of 10% of the 365 indicators, and we compared the assessments using Kappa statistics. Four of the experts were women, aged 33, 33, 37 and 58 years, and four were men, aged 40, 42, 55 and 70 years. Informed consent was obtained from all eight experts, and confidentiality and anonymity were maintained throughout the research process. No compensation was provided, and no potential conflicts of interest were identified.

We also compared the proportions of agreed indicators for the GBF suitable for involving local stakeholders in their monitoring with those of the Strategic Plan for Biodiversity 2011-2020 and the associated Aichi Biodiversity Targets and 11 other institutions and agreements, using data and an analytical approach from an earlier paper.

Research sample

There are 365 agreed indicators to measure progress towards goals and targets in the GBF (version 19 December 2022). We assessed monitoring possibilities, ranging from scientist-driven to those undertaken by local people, for each of these 365 indicators.

The dataset comprise three categories of indicators: (1) 26 Headline indicators: A minimum set of high-level indicators which capture the overall scope of the goals and targets of the GBF, for national reporting and may also be used for global level communications; ten of these are listed twice, once for a goal and once for a target; (2) 64 Component indicators: A set of indicators for monitoring each component of each goal and target of the GBF; (3) 265 Complementary indicators: A set of indicators for thematic or in-depth analysis of each goal and target.

The dataset on indicators was made available by the Convention on Biological Diversity (<https://www.cbd.int/doc/c/179e/aecb/592f67904bf07dca7d0971da/cop-15-l-26-en.pdf>).

Sampling strategy

We assessed monitoring possibilities, ranging from scientist-driven to those undertaken by local people, for all the 365 agreed indicators in the GBF. We calculated the proportion of indicators for tracking implementation of the GBF that are suitable to monitoring using monitoring programs of type A, B, C-D, and E. We also calculated the proportion of indicators that, for different reasons, are constrained in involving local stakeholders in their measurements, and, in addition, our confidence in the coding. As a measure of our confidence in the coding we had provided, we used the proportion of indicators (averaged between the two evaluators) where we personally knew of specific, or closely related, examples of monitoring programs in which the indicators had been populated with data.

The assignment of monitoring program types to indicators for the Strategic Plan for Biodiversity 2011-2020 and the associated Aichi Biodiversity Targets and 11 other institutions and agreements in the past was also undertaken by Neil D. Burgess and Finn Danielsen, and the same four types of monitoring programs (type A, B, C-D, and E), the same categories of main constraints, the same measure of our confidence in the coding, and the same analytical approach were used.

Data collection

The data were typed into an Excel spreadsheet by Finn Danielsen, Neil D. Burgess and Max Isaac.

Timing and spatial scale

We covered the agreed indicators in the GBF as of 19 December 2022. Regarding the spatial coverage, the indicators in the GBF cover all parts of the world, without any geographic restriction.

Data exclusions

No data were excluded from the analyses.

Reproducibility

First – the GBF indicator dataset we used is freely available on a website for anyone to use and based on material published online by the Convention on Biological Diversity. Second – we used a methodology that was already published in a past paper we had led to ensure comparability of our results with past studies. Third – we used several measures to enhance the reproducibility of categorization of indicators into groups. A) The assignment of monitoring scheme types to indicators was undertaken independently by two persons, N.D.B. and F.D., and when we disagreed, consensus was reached through discussion. B) We determined for each indicator whether we personally knew of specific, or closely related, examples of monitoring programs in which the indicator had been populated with data, as a measure of our certainty in the coding assigned. C) We asked eight experts with experience in working with environmental monitoring and management at the local district/village/provincial/sub-regional or at the national/international level from across the world (Latin America 3; Asia 2; Africa 1; Europe 1; Oceania 1) to complete a random spot test of 10% of the 365 indicators, and we compared the assessments using Kappa statistics. Others could repeat our approach using the same dataset to see if they arrive at similar results. We have made the raw data available to facilitate this in case anyone wants to repeat the study.

Randomization

Randomization is not relevant in our study as we worked with the complete set of 365 agreed indicators to measure progress towards goals and targets in the GBF.

The four types of monitoring programs (type A, B, C-D, and E) that we used for our evaluation of the 365 indicators were derived from our previously published typology of environmental monitoring systems (Danielsen, F., Pirhofer-Walzl, K., Adrian, T. P., Kapijimpanga, D. R., Burgess, N. D. et al. *Conserv. Lett.* 7, 12-24; 2014). This typology was statistically defined. It was based on a cluster analysis of 17 parameters that characterize the type of program among 107 monitoring programs with complete data, extracted from a total of 3,454 published papers that present monitoring results.

Blinding

Blinding is not relevant in our study, because the study did not involve a control and a treatment group.

Did the study involve field work? ☐ Yes ☒ No

Reporting for specific materials, systems and methods

We require information from authors about some types of materials, experimental systems and methods used in many studies. Here, indicate whether each material, system or method listed is relevant to your study. If you are not sure if a list item applies to your research, read the appropriate section before selecting a response.

Materials & experimental systems

n/a	Involved in the study
☒	☐ Antibodies
☒	☐ Eukaryotic cell lines
☒	☐ Palaeontology and archaeology
☒	☐ Animals and other organisms
☒	☐ Clinical data
☒	☐ Dual use research of concern

Methods

n/a	Involved in the study
☒	☐ ChIP-seq
☒	☐ Flow cytometry
☒	☐ MRI-based neuroimaging