Incomplete coverage of the state of nature across biodiversity credit methodologies: an assessment using the State of Nature metrics framework

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Abstract

Biodiversity credits are growing rapidly, yet the proliferation of methodologies has raised concerns about their quality and integrity. Because biodiversity cannot be reduced to a single common unit, methodologies differ in their choice of indicators; previous comparative studies, however, have examined only aggregation levels or taxonomic focus, leaving unaddressed how comprehensively methodologies measure the state of nature. The recently developed State of Nature (SoN) metrics framework is emerging as a globally aligned framework for measuring the state of nature. Using its four core indicators, ecosystem extent, ecosystem condition, species extinction risk, and species populations, this study analyzed 13 biodiversity credit methodologies by organizing 51 extracted metrics into 21 indicators. These indicators were mapped onto the core indicators, and their cumulative publication counts for 1980–2025 were compared with the number of methodologies in which they were adopted. Coverage was uneven: 16 indicators corresponded to ecosystem condition and only 2 indicators to species-related core indicators, and 11 of 13 methodologies lacked at least one core indicator. For several abiotic indicators, adoption remained limited despite substantial research accumulation. Most methodologies therefore fail to assess at least one aspect of the state of nature, and broader coverage, particularly of species-related indicators, is needed.

Keywords: Biodiversity credit, Indicator, State of Nature metrics

1. Introduction

The loss of biodiversity is already positioned as an issue that has exceeded the safe zone of the planetary boundaries framework, which defines the safe operating space of the Earth system (Rockström et al., 2009). Curbing this loss and achieving recovery requires the mobilization of financial resources on a scale far greater than that currently available (Nature Conservancy, 2020; UNEP, 2023). The Kunming-Montreal Global Biodiversity Framework, adopted in 2022, calls for the mobilization of diverse funding sources, including both public and private finance, to close the biodiversity finance gap (CBD, 2022). As one such means, biodiversity credits have attracted increasing interest (IUCN, 2024; World Economic Forum [WEF] et al., 2025).

Biodiversity credits are a mechanism that quantifies positive biodiversity outcomes generated through conservation and restoration activities and mobilizes finance by expressing these outcomes as tradable units (Wauchope et al., 2024). In recent years, their institutional development has advanced rapidly, with more than 30 methodologies proposed by international standards, governments, academic institutions, and private operators (Holmlund et al., 2026; WEF & McKinsey, 2024; Zero Carbon Analytics, 2023). At the same time, as the number of methodologies increases, ensuring the quality and/or integrity of the credits has become a pressing challenge (Kim et al., 2025; Wunder & Fraccaroli, 2025).

Ensuring the integrity of biodiversity credits requires clarifying which aspects of nature are assessed and selecting indicators appropriate to those aspects (Kim et al., 2025). Such indicator selection is not straightforward, however, because biodiversity comprises multiple aspects, including genes, species, ecosystems, and their functions (Purvis & Hector, 2000), and cannot be quantified with a single common unit, as is the case for greenhouse gases (Crona et al., 2026). Approximately 570 metrics have been proposed to quantify biodiversity to date (Antonelli et al., 2024), and individual credit methodologies differ in the indicators they adopt and in how these indicators are aggregated (Croci et al., 2025; Maczik et al., 2024; Rossberg et al., 2023; WEF & McKinsey, 2024; Wunder et al., 2025). Consequently, there is limited consistency regarding which aspects of nature are assessed and credited across biodiversity credit methodologies. This fragmentation reduces transparency and comparability and may undermine the integrity of biodiversity credits (Kim et al., 2025; Wauchope et al., 2024).

In response to this challenge, the Nature Positive Initiative (NPI) has been developing State of Nature (SoN) metrics, which measure the state of nature within a common framework (Moro, 2025). The SoN metrics comprise four core indicators: ecosystem extent, ecosystem condition, species extinction risk, and species populations. This framework can serve as a reference for organizing the large number of existing indicators and for comparing which aspects of nature different indicators measure. Furthermore, this framework is being considered for incorporation into major disclosure and target-setting frameworks, including those of the Taskforce on Nature-related Financial Disclosures (TNFD), the Global Reporting Initiative (GRI), and the Science Based Targets Network (SBTN) (NPI, 2026; TNFD, 2026), and is therefore likely to serve as a common reference for assessing the state of nature, particularly as businesses are increasingly expected to demonstrate measurable contributions to societal biodiversity goals (White et al., 2024).

Existing comparative studies of biodiversity credits have nevertheless characterized the indicators and design features adopted by methodologies from a limited set of perspectives: the degree of aggregation, that is, whether a single indicator or a composite indicator is used (Croci et al., 2025; WEF & McKinsey, 2024); whether the object of assessment is species or habitats (Croci et al., 2025; Wunder et al., 2025); and whether the indicators are biotic or abiotic (WEF & McKinsey, 2024). However, these studies have not examined how comprehensively the methodologies measure the state of nature.

This study therefore organizes the metrics extracted from 13 biodiversity credit methodologies into 21 indicators and analyzes them within the framework of the SoN metrics, with two objectives. First, this study examines which aspects of nature each methodology measures, based on their correspondence with the four core indicators of the SoN metrics. Second, using the cumulative number of publications as a proxy for the accumulation of research, this study examines the relationship between this accumulation and the degree to which each indicator is adopted across methodologies. By clarifying the bias in what the methodologies assess and the extent to which research accumulation corresponds to indicator adoption, this study identifies the challenges that must be addressed to assess the state of nature more comprehensively.

2. Materials and methods

2.1 Selection of biodiversity credit methodologies and extraction of metrics

Candidate biodiversity credit methodologies were collected from the list of relevant initiatives published by the Yale University Biodiversity Credits Project (Yale University, 2026). Among the 32 listed methodologies and standards, only those with publicly available, freely accessible technical documentation, including credit quantification formulas, were retained. This screening resulted in 13 methodologies for analysis (Table 1). For each methodology, metrics used to quantify credit units were extracted from the methodological documentation. In this study, a metric was defined as a measurement or calculation formula operationally specified within a methodology to quantify a particular aspect of nature or biodiversity, whereas an indicator was defined as a higher-level concept grouping multiple metrics that measure a common attribute.

Table 1. The list of biodiversity credits in this study, with the technical documentation from which the metrics were extracted

Publisher / program name	Country of publisher
Verra / SD Vista (Verra, 2023)	United States
Plan vivo / PV nature (Plan Vivo Foundation, 2025)	United Kingdom
Wallacea Trust / rePlanet Biodiversity Credits (Wallacea Trust, 2023)	United Kingdom
Government of UK / Biodiversity net gain (BNG) (Department for Environment, Food and Rural Affairs [Defra], 2025)	United Kingdom
South Pole / Biodiversity Credits (South Pole, n.d.)	Switzerland
OpenEarth / Marine Ecosystem Credits (Filippi et al., 2022)	United States
Queen Mary University / Biodiversity Stewardship Credits (Rossberg et al., 2023)	United Kingdom
Single Earth / Ecosystem Integrity and Biodiversity Credits (Dias et al., 2023)	Estonia
Ecosystem regeneration associates (ERA) / Biodiversity stewardship credits (ERA Carbon Serviços Ambientais Ltda, 2024)	India
CreditNature / Natural asset recovery investment analytics (NARIA) (Jepson et al., 2024)	United Kingdom
Terrasos / Biodiversity credits, biocredits and biodiversity units (Terrasos, 2024)	Colombia
Savimbo / Cercarbono's biodiversity certification programme (Savimbo, 2024)	Colombia
BioCarbon Standard / Biodiversity credits (BioCarbon Cert., 2025)	Colombia

2.2 Extraction of metrics from methodologies and classification of indicators

Metrics with identical or similar measurement targets were integrated into 21 indicators based on the framework proposed by WEF & McKinsey (2024). The metrics, their classification into indicators, and the methodologies included in the analysis were presented in the supplementary material (Table S1). Next, the 21 indicators were classified into three categories—biotic, abiotic, and combined—according to their measurement targets, following the metric classification criteria of WEF & McKinsey (2024). Biotic indicators were defined as those that directly assess biological entities, such as species richness and population abundance; abiotic indicators as those that assess environmental conditions, such as soil and water quality; and combined indicators as those that integrate multiple components, such as habitat condition and ecosystem integrity. The 21 indicators were then assigned to one of the four core indicators of the SoN metrics—(i) ecosystem extent, (ii) ecosystem condition, (iii) species extinction risk, and (iv) species populations—following the classification criteria of NPI (2026) and TNFD (2026). In this study, core indicators were treated as a higher-level concept than the indicators defined in section 2.1. The core indicators addressed by each methodology were subsequently identified through the indicators that the methodology adopted. On this basis, the number of indicators and methodologies corresponding to each core indicator, as well as the number of core indicators covered by each methodology, were compiled and summarized.

2.3 Collection of publication count data

For each metric, a search query was constructed to identify research papers whose title or abstract contained the metric name (Table S2). Each query was submitted to the OpenAlex API (Priem et al., 2022) to retrieve the number of publications published between 1980 and 2025. For indicators comprising multiple metrics, the search results for the constituent metrics were summed to obtain the cumulative number of publications at the indicator level. The temporal trends in the number of publications for each of the four core indicators of the SoN metrics were presented in the supplementary material (Figure S1).

2.4 Analytical approach

The degree of adoption of each indicator was quantified as the number of methodologies that employed it. First, the correspondence between the 13 methodologies and the 21 indicators was visualized using a Sankey diagram, and the extent to which the indicators and methodologies covered the four core indicators of the SoN metrics was compared descriptively. Second, the relationship between the cumulative number of publications and the number of adopting methodologies was examined across the 21 indicators. Data retrieval, aggregation, analysis, and visualization were conducted in R version 4.5.3.

3. Results and discussion

3.1 Which aspects of the state of nature do the methodologies assess?

Of the 21 indicators extracted from the 13 methodologies, 16 corresponded to “ecosystem condition”, 3 to “ecosystem extent”, 1 to “species extinction risk”, and 1 to “species populations” (Table 2). The diversity of indicators was thus lower for the species-related core indicators than for the ecosystem-related core indicators.

Table 2. Correspondence between the four core indicators of the State of Nature (SoN) and

the indicators used across the 13 methodologies.

Core indicators of the State of Nature	Corresponding indicators
Ecosystem extent	Habitat area/extent; land-use change extent; mangrove forest cover
Ecosystem condition	species richness; species diversity; vegetation structure; trophic function; bird trait diversity; primary productivity; Mean species abundance (MSA); soil organic carbon; water quality; pollutants removed; water stress; habitat condition; landscape connectivity; vegetation spatial diversity; ecosystem integrity; forest landscape integrity
Species extinction risk	Species extinction risk
Species populations	Population size / abundance

At the methodology level, Figure 1 shows that 7 of the 13 methodologies measured “ecosystem extent”, 13 of 13 measured “ecosystem condition”, 10 of 13 measured “species extinction risk”, and 5 of 13 measured “species populations”. Regarding the core indicator coverage of each methodology, 2 of the 13 methodologies covered all four core indicators, 6 methodologies covered 3 core indicators, 4 methodologies covered 2 core indicators, and 1 methodology covered a single core indicator. Accordingly, 11 of the 13 methodologies lacked at least one core indicator of the SoN metrics.

In contrast to the species-related core indicators, those corresponding to the ecosystem-related core indicators were comparatively diverse, comprising 45 metrics across 19 indicators. These findings are consistent with previous studies. Based on a review of 34 cases, Wunder et al. (2025) identified fewer species-based indicators than ecosystem-based indicators and noted that biodiversity credits tend to lack species population metrics, which accords with the present result that only 5 of the 13 methodologies measured “species populations”. Likewise, Marshall et al. (2020) reported that 70% of the metrics used in biodiversity offsets rely on habitat attributes or habitat area, corresponding to the concentration of indicators in the ecosystem-related core indicators observed here.

Notably, these results indicate that the aspects of nature measured by current methodologies were not evenly distributed across the four core indicators of the SoN metrics. Duffus et al. (2025) noted that ecosystem condition indicators, such as the area-condition approach adopted in the statutory biodiversity metric (Defra, 2025), do not adequately capture changes at the species level. Considering this, ecosystem- and species-level indicators will need to be combined to enable a more integrated assessment. The following section turns to the relationship between the adoption of each indicator across methodologies and the accumulation of scientific knowledge underpinning it.

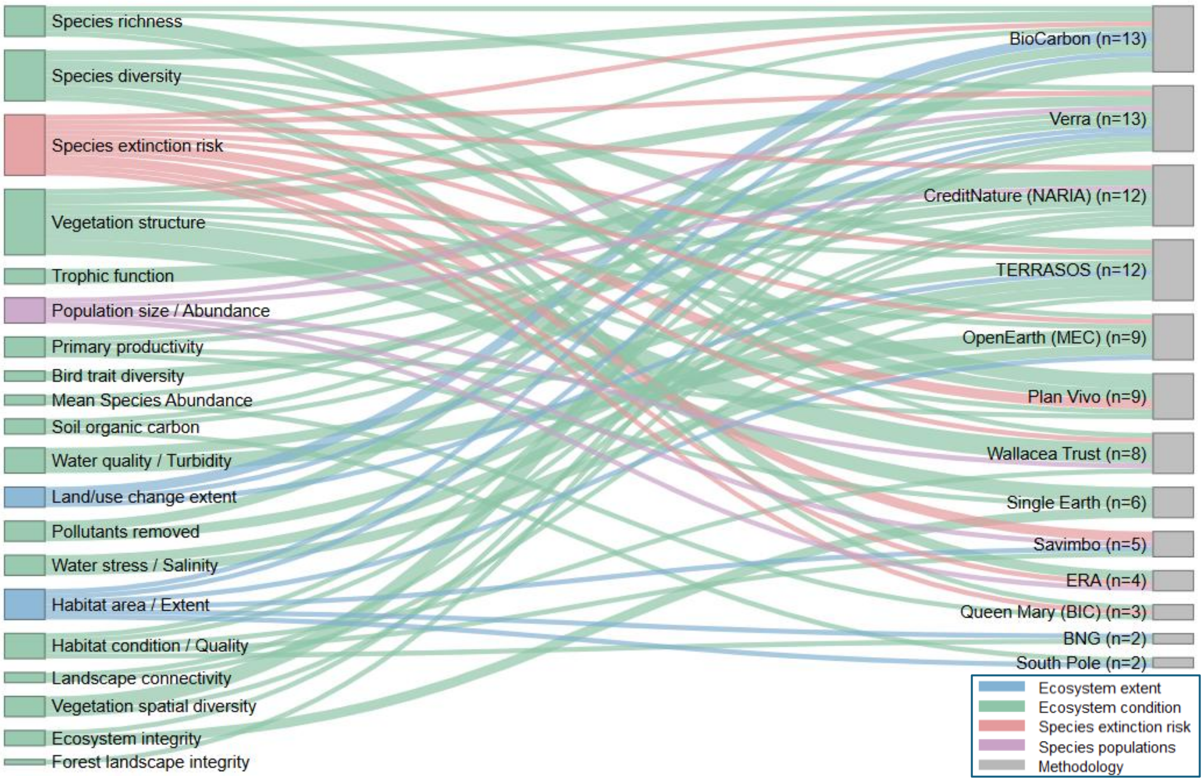

Figure 1. Sankey diagram showing the correspondence between the 13 biodiversity credit methodologies and the 21 indicators used across them. Indicators are shown on the left and methodologies on the right, and the links represent the correspondence between indicators and methodologies. Indicators were color-coded according to the four core indicators of the State of Nature metrics to which they correspond.

3.2 Relationship between methodological adoption and scientific accumulation of indicators

For the 21 indicators used across the methodologies, the relationship between the cumulative number of publications and the number of methodologies adopting each indicator was examined at the indicator level (Figure 2). Overall, indicators with a larger number of publications tended to be adopted by more methodologies. However, this relationship was not captured by a single linear trend, and two broad patterns were apparent. (i) The first comprised indicators for which the two variables were aligned, such that a greater accumulation of publications corresponded to adoption by a greater number of methodologies. (ii) The second comprised indicators for which the two variables were decoupled, in that adoption remained limited despite a substantial accumulation of publications.

The first group (i) included indicators such as species richness, habitat area/extent, species diversity, and habitat condition/quality, for which the accumulation of publications corresponded to the number of adopting methodologies. By contrast, the second group (ii) contained a larger proportion of abiotic indicators than the first, such as soil organic carbon and water quality, which do not measure biodiversity directly but instead assess it indirectly through habitat conditions or ecosystem functions. Although these indicators in group (ii) have been supported by numerous previous studies, they were adopted by only 2 to 3 methodologies. The extent of scientific attention was therefore not reflected in the degree of adoption, and these indicators deviated from the linear relationship observed in the first group (i).

This two-group structure suggests that the bias in what the methodologies measure cannot be sufficiently explained by the amount of research accumulated on each measurement target alone. Given that group (ii) consisted mainly of abiotic indicators, whereas the habitat-based indicators in group (i) were widely adopted despite also being indirect measures of biodiversity, the abiotic nature of the indicators, rather than the indirectness of measurement itself, may be associated with their limited adoption. This tendency may be influenced by factors such as ease of measurement, the cost of data acquisition, convertibility into credit units, auditability, and the degree of standardization (e.g., Wunder & Fraccaroli, 2025). However, the data used in this study do not allow the relative contribution of these factors to be identified.

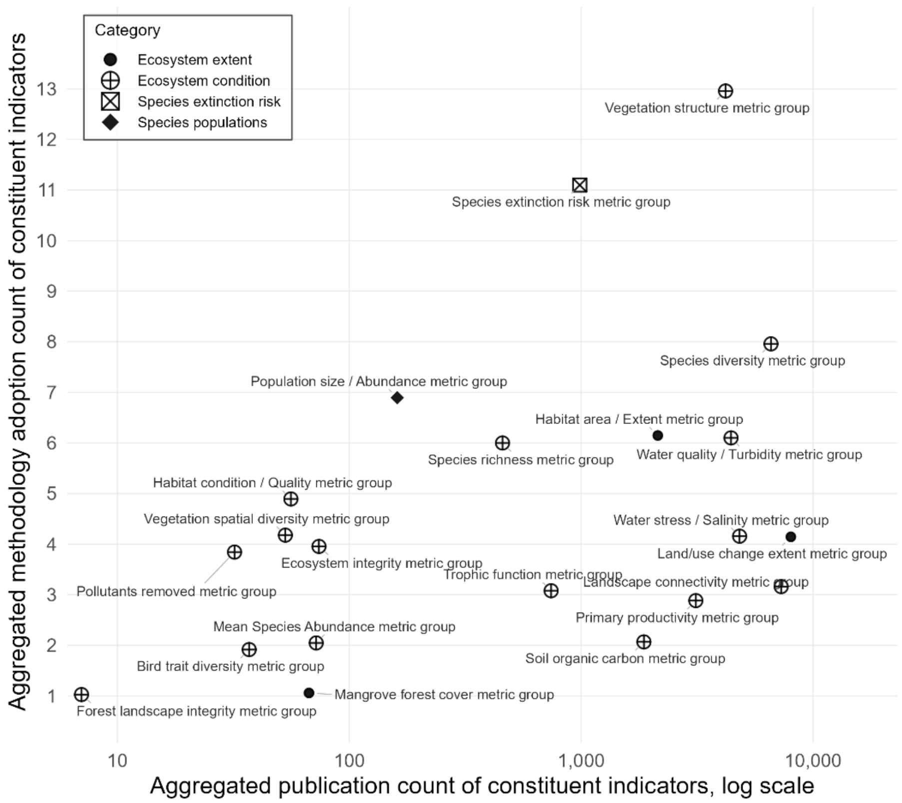

Figure 2. The relationship between the cumulative number of publications and the number of adopting methodologies for the 21 indicators extracted from the methodologies. Each point represents one indicator, and its publication count corresponds to the aggregated search results for the metrics classified under that indicator.

4. Conclusion

This study mapped 21 indicators extracted from 13 biodiversity credit methodologies into the four core indicators of the SoN metrics to examine how comprehensively the methodologies measure the state of nature, and analyzed the relationship between the accumulation of research on each indicator and its degree of adoption across methodologies. The results showed that 11 of the 13 methodologies lacked at least one core indicator of the SoN metrics, and that the aspects of nature they measured were concentrated on the ecosystem-related indicators. Moreover, research accumulation and the degree of adoption corresponded for some indicators but diverged for others, indicating that adoption also depends on implementation-related conditions, such as convertibility into credit units and auditability, whose relative importance remains to be determined. To prevent integrity from being compromised as biodiversity credits expand, it will likely be necessary for methodologies to broaden the aspects of nature they measure, particularly by addressing species-related indicators.

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Appendix

Supplement table S1. Biodiversity assessment metrics used in major biodiversity credits methodologies.

Category (biotic/abiotic/combined)	Indicator: (Specific indices in sources)	Adopted Methodology
Biotic metrics	Species richness: (Hill numbers (q=0), Margalef Alpha Index, ASVs / OTUs (eDNA), Rarefaction-corrected richness)	BioCarbon, Verra, PV Nature, Wallacea Trust
	Species diversity: (Hill numbers (q=1), Simpson Index, Shannon-Wiener Index, WEGE index, Taxonomic dissimilarity, BIC/BSC)	BioCarbon, OpenEarth (MEC), PV Nature, Queen Mary (BIC), ERA, TERRASOS
	Species extinction risk: (Species Threat Abatement and Restoration (STAR), IUCN Red List Index (RLI), LPI (Living Planet Index))	OpenEarth (MEC), ERA, Verra, TERRASOS, BioCarbon, Savimbo (ISBM), CreditNature (NARIA), Wallacea Trust, PV Nature, Queen Mary (BIC)
	Vegetation structure: (Aboveground biomass, Canopy height, Reef rugosity, Kelp volume, Loss in Forest Connectivity (LFC))	BioCarbon, Verra, Single earth, TERRASOS, Wallacea Trust, OpenEarth (MEC), PV Nature
	Trophic function: (TFM (Trophic Function metric), Trophic cascades, Functional effects of megafauna)	CreditNature (NARIA)
	Population size / Abundance (Relative abundance score (quintile rank), Bioabundance, Population size of keystone species)	Wallacea Trust, ERA, CreditNature (NARIA), Savimbo (ISBM), Verra
	Primary productivity: (NPP (Net Primary Production), NDVI (Normalized Difference Vegetation Index))	Single earth, PV Nature, Verra, CreditNature (NARIA)
	Bird trait diversity: (Bird Trait Diversity metric, Niche occupancy traits)	CreditNature (NARIA)
	Mangrove forest cover	BioCarbon
	Mean Species Abundance (MSA)	Verra, Queen Mary
Abiotic metrics	Soil organic carbon	South Pole, Verra, CreditNature (NARIA)
	Water quality / Turbidity: (Turbidity, Water pH, Eutrophication level, Stream nutrient level)	OpenEarth (MEC), TERRASOS
	Land/use change extent: (Land cover change, PLAND (Percentage of Landscape))	BioCarbon, Verra, TERRASOS
	Pollutants removed: (Concentration of key pollutants, Pesticide / Fertilizer amount)	BioCarbon, TERRASOS
	Water stress / Salinity	OpenEarth (MEC), TERRASOS
Combined metrics	Habitat area / Extent	Statutory Metric (BNG), BioCarbon, OpenEarth (MEC), Verra, South Pole, Savimbo (ISBM)
	Habitat condition / Quality: (ECI (Ecosystem Condition Index), Condition score (0-1 scale), Structural metric rank)	Statutory Metric (BNG), CreditNature (NARIA), Verra, Wallacea Trust, Savimbo (ISBM)
	Landscape connectivity: (Landscape Connectivity metric, Percentage of Landscape Core Area)	CreditNature (NARIA), TERRASOS
	Vegetation spatial diversity: (Vegetation Spatial Diversity metric, Contagion index, Perimeter-Area Fractal Dimension)	BioCarbon, CreditNature (NARIA)
	Ecosystem integrity: (EII score (Ecosystem Integrity Index), BII (Biodiversity Intactness Index))	Single earth, Verra
	Forest landscape integrity index	Verra

Supplement table S2. the corresponding literature search queries of the metrics

Indicator	Metric	Search query
Species richness	Hill numbers q=0	"Hill numbers" AND "q 0" AND biodiversity
Species richness	Margalef Alpha Index	("Margalef Alpha Index" OR "Margalef index") AND biodiversity
Species richness	ASVs/OTUs eDNA	("amplicon sequence variants" OR "ASVs" OR "OTUs") AND ("eDNA" OR "environmental DNA") AND biodiversity
Species richness	Rarefaction-corrected	("rarefaction-corrected richness" OR "rarefied richness" OR "rarefaction

	rich.	corrected species richness") AND biodiversity
Species diversity	Hill numbers q=1	"Hill numbers" AND "q 1" AND biodiversity
Species diversity	Shannon-Wiener Index	("Shannon-Wiener Index" OR "Shannon Wiener Index" OR "Shannon diversity index" OR "Shannon index") AND biodiversity
Species diversity	Simpson Index	("Simpson Index" OR "Simpson diversity index") AND biodiversity
Species diversity	WEGE index	("WEGE index" OR "Weighted Endemism and Global Endangerment") AND biodiversity
Species diversity	Taxonomic dissimilarity	("taxonomic dissimilarity" OR "taxonomic distinctness" OR "Delta distinctness") AND biodiversity
Species diversity	BIC / BSC	("Biodiversity Impact Credit" OR "BIC") AND ("Biodiversity Stewardship Credit" OR "BSC") AND biodiversity
Species extinction risk	STAR	("Species Threat Abatement and Recovery" OR "STAR metric" OR "STAR biodiversity") AND biodiversity
Species extinction risk	IUCN Red List	"IUCN Red List" AND ("Critically Endangered" OR "Endangered" OR "Vulnerable") AND biodiversity
Vegetation structure	Aboveground biomass	("aboveground biomass" OR "AGB") AND biodiversity
Vegetation structure	Canopy height / cover	("canopy height" OR "canopy cover") AND biodiversity
Vegetation structure	Reef rugosity	("reef rugosity" OR "coral reef rugosity") AND biodiversity
Vegetation structure	Kelp volume	("kelp volume" OR "kelp forest volume") AND biodiversity
Vegetation structure	LFC (forest connectivity)	("Loss in Forest Connectivity" OR "forest connectivity loss" OR "LFC") AND biodiversity
Trophic function	TFM (trophic function)	("Trophic Function metric" OR "trophic function metric" OR "TFM") AND biodiversity
Trophic function	Trophic cascades	("trophic cascades" OR "trophic cascade") AND biodiversity
Trophic function	Megafauna function	("functional effects of megafauna" OR "megafauna functional effects" OR "megafauna function") AND biodiversity
Species extinction risk	LPI	("Living Planet Index" OR "LPI") AND biodiversity
Population size / Abundance	Relative abundance score	("relative abundance score" OR "quintile rank") AND biodiversity
Population size / Abundance	Bioabundance	("Bioabundance" OR "bio abundance") AND biodiversity
Population size / Abundance	Population keystone species	("population size" OR "population abundance") AND "keystone species" AND biodiversity
Primary productivity	NPP	("Net Primary Production" OR "net primary productivity" OR "NPP") AND biodiversity
Primary productivity	NDVI	("Normalized Difference Vegetation Index" OR "NDVI") AND biodiversity
Bird trait diversity	BTD (bird trait diversity)	("Bird Trait Diversity" OR "bird trait diversity metric" OR "BTD") AND biodiversity
Bird trait diversity	Niche occupancy traits	("niche occupancy traits" OR "niche occupancy") AND biodiversity
Mangrove forest cover	Mangrove forest cover	("mangrove forest cover" OR "mangrove cover percentage" OR "mangrove cover") AND biodiversity
Mean Species Abundance (MSA)	MSA (mean species abund.)	("Mean Species Abundance" OR "MSA") AND biodiversity
Soil organic carbon	Soil organic carbon	("soil organic carbon" OR "SOC") AND biodiversity
Water quality / Turbidity	Turbidity	("turbidity" OR "water turbidity") AND biodiversity
Water quality / Turbidity	Water pH	("water pH" OR "stream pH" OR "river pH") AND biodiversity
Water quality / Turbidity	Eutrophication	("eutrophication level" OR "eutrophication index" OR "eutrophication") AND biodiversity
Water quality / Turbidity	Stream nutrient level	("stream nutrient level" OR "stream nutrients" OR "river nutrients" OR "nutrient concentration") AND biodiversity
Land-use change extent	Land cover change	("land cover change" OR "land-use change" OR "land use change") AND biodiversity
Land-use change extent	PLAND	("Percentage of Landscape" OR "PLAND") AND biodiversity
Pollutants removed	Pollutants removed	("concentration of pollutants" OR "key pollutants" OR "pollutant concentration" OR "pollutants removed") AND biodiversity
Pollutants removed	Pesticide / Fertilizer	("pesticide amount" OR "pesticide use") AND ("fertilizer amount" OR "fertilizer use") AND biodiversity
Water stress / Salinity	Salinity level	("salinity level" OR "water salinity" OR "soil salinity" OR "salinity") AND biodiversity
Water stress / Salinity	Water stress	("water stress" OR "level of water stress") AND biodiversity
Habitat area / Extent	Habitat extent / area	("habitat extent" OR "habitat area") AND biodiversity
Landscape connectivity	Landscape connectivity	("Landscape Connectivity metric" OR "landscape connectivity") AND biodiversity
Landscape connectivity	Core area	("core area" OR "landscape core area" OR "CORE") AND biodiversity
Landscape connectivity	C%LAND (core area %)	("Percentage of Landscape Core Area" OR "CLAND") AND biodiversity
Vegetation spatial diversity	VSD (veg spatial div.)	("Vegetation Spatial Diversity" OR "vegetation spatial diversity metric" OR "VSD") AND biodiversity
Vegetation spatial diversity	CONTAG (contagion index)	("Contagion index" OR "CONTAG") AND biodiversity
Vegetation spatial diversity	PAFRAC	("Perimeter-Area Fractal Dimension" OR "PAFRAC") AND biodiversity

Ecosystem integrity	EII (integrity index)	("Ecosystem Integrity Index" OR "EII score" OR "EII") AND biodiversity
Ecosystem integrity	BII (intactness index)	("Biodiversity Intactness Index" OR "BII") AND biodiversity
Ecosystem integrity	ECI (condition index)	("Ecosystem Condition Index" OR "ECI") AND biodiversity
Forest landscape integrity index	FLII (forest integrity)	("Forest Landscape Integrity Index" OR "FLII") AND biodiversity

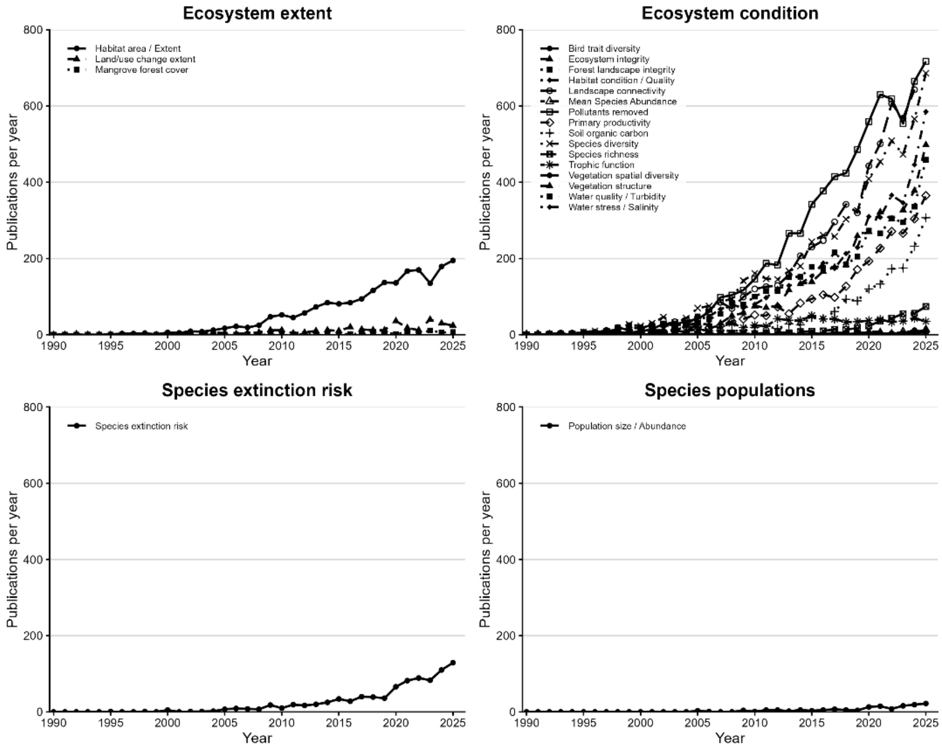

Figure S1. Temporal trends in the number of publications by core indicator. Publication counts for the 21 indicators, aggregated into the four core indicators of the State of Nature metrics (ecosystem extent, ecosystem condition, species extinction risk, and species populations), 1980–2025.