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REPORT

PUBLIC AND EXPERT PREFERENCES FOR BIODIVERSITY METRICS AND THE IMPLICATIONS FOR SHADOW PRICING

Photograph: Joshua Woroniecki, Unsplash

This paper addresses a fundamental but underexplored question in biodiversity policy: how the choice of biodiversity metrics affects welfare outcomes, policy priorities, and the implied economic value of biodiversity. Biodiversity metrics underpin decisions in areas ranging from international conservation targets and biodiversity offsetting to ESG disclosures and sustainable finance.

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Summary of Meier et al. (2025)

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Public and Expert Preferences for Biodiversity Metrics and the Implications for Shadow Pricing

Research and policy question

This paper addresses a fundamental but underexplored question in biodiversity policy: how the choice of biodiversity metrics affects welfare outcomes, policy priorities, and the implied economic value of biodiversity. Biodiversity metrics underpin decisions in areas ranging from international conservation targets and biodiversity offsetting to ESG disclosures and sustainable finance. Yet there is limited understanding of whether widely used metrics reflect what society actually values about biodiversity. The core policy question is whether current biodiversity metrics align with public and expert preferences, and how alternative, welfare-based metrics could support cost-effective biodiversity policy and shadow pricing under fixed conservation targets.

Methodological approach

The authors employ a discrete choice experiment (DCE) to elicit preferences over key terrestrial biodiversity attributes without requiring respondents to make explicit monetary trade-offs. A nationally representative sample of the UK public is surveyed alongside two additional groups: biodiversity experts and financial-sector practitioners. Respondents are asked to choose between hypothetical conservation sites characterised by attributes such as species richness, extinction risk, population size and intactness, habitat area and intactness, and genetic distinctiveness. Estimated preferences are then used to construct a welfare-based composite biodiversity metric. In a second step, the paper applies this metric in a spatial case study of habitat restoration across Great Britain, comparing how different metrics affect cost-effective site selection and the implied shadow prices of biodiversity under a fixed restoration target.

Findings

Across all three samples—public, experts, and financial practitioners—the strongest preferences are consistently found for increasing species richness, reducing extinction risk, and preserving genetic distinctiveness. By contrast, respondents display relatively weak preferences for commonly used intactness measures, despite their prominence in policy, biodiversity crediting, and ESG reporting. This alignment across groups suggests that the divergence between public values and current metrics is not driven by expert or financial-sector priorities, but by the absence of welfare considerations in metric selection. The spatial restoration case study demonstrates that metric choice has large implications for policy outcomes: different metrics lead to markedly different restoration priorities, costs, and welfare gains. A preference-weighted 'utility' metric consistently identifies restoration strategies that deliver greater welfare per unit cost than single-attribute metrics.

Policy implications

The findings highlight the need to rethink how biodiversity is measured in policy and finance. Metrics that are convenient to measure or already embedded in reporting frameworks may fail to capture what society values most about biodiversity. The welfare-based metric proposed in the paper offers a practical way to align biodiversity targets with societal preferences and to support a cost-based approach to biodiversity shadow pricing. Under this approach, shadow prices are defined by the marginal cost of delivering welfare-relevant biodiversity gains under fixed policy targets, analogous to emerging cost-based approaches in climate policy. This framework can inform biodiversity offsetting, nature finance, and national and international conservation strategies by improving value for money, transparency, and legitimacy.

Links and materials

Meier, S. et al. (2025). Public and expert preferences for biodiversity metrics and the implications for shadow pricing. Working paper version: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4954302

Related work on cost-based biodiversity pricing:
Ben Groom, Joseph Lowe, Sophus zu Ermgassen, E. J. Milner-Gulland, Thomas Atkins, Ben Balmford, Amy Binner, Amber Butler, Brett Day, Natalie Duffus, Rosie Hails, Hannah Maier-Peveling, Mattia Mancini, Sarah Meier, Hannah Nicholas, Daniele Rinaldo, Robin Smale, Pat Snowdon, Frank Venmans, Ian J. Bateman (2026). Bringing the economics of biodiversity into policy and decision-making. https://arxiv.org/abs/2601.16801

Attribute	Level 1	Level 2	Level 3	Level 4	Units
Species richness	50	100	200	300	number
Probability of extinction	1	5	10	25	% species per 1,000 years
Population size	25	50	100	200	number
Population intactness	0.1	0.5	0.9		number
Habitable area	250	500	1000	2000	hectares
Habitable area intactness	0.1	0.5	0.9		number
Distinctiveness	25	50	75		million years ago (MYA)

Table 1. Attributes and levels for the Choice Experiment

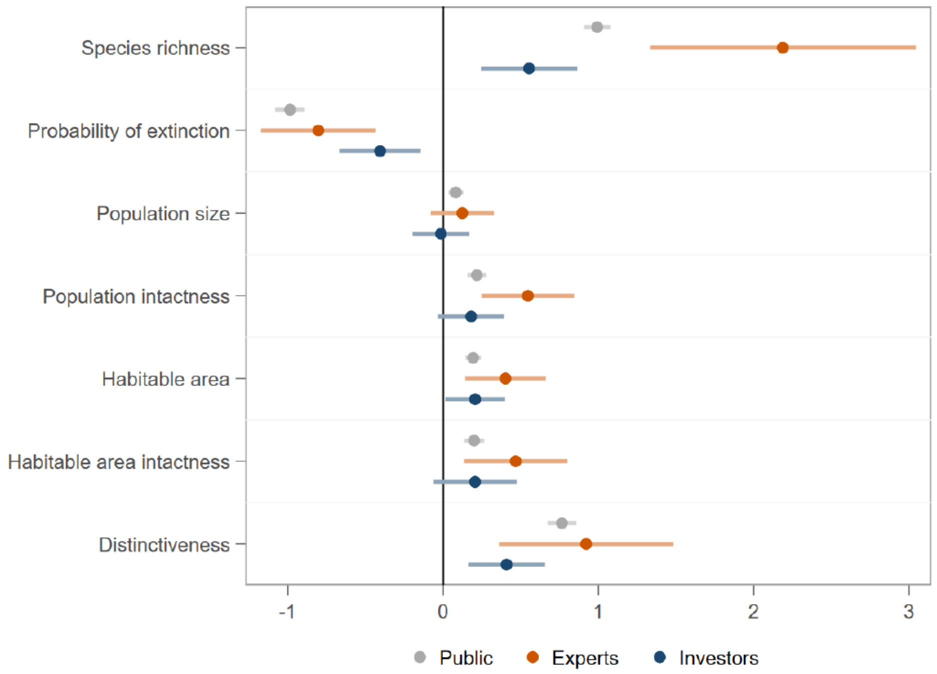

Figure 1: Semi-elasticities of the biodiversity attributes

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Economic Policy Decision Making for Biodiversity

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