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<https://doi.org/10.1057/s41599-024-02891-z>

OPEN

Mainstreaming social sciences expertise in UK environment policy and practice organisations: retrospect and prospect

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Building upon the concept of mainstreaming social sciences within conservation, we consider their mainstreaming, and so integration, within UK environment policy and practice (EPP) organisations. The paper responds to increasing calls to recognise the essential role of social sciences in addressing global environmental crises across policy, practice and research. An actor-oriented approach was deployed, producing empirical information from a multi-stage, co-designed, collaborative study involving 19 social scientists from a range of EPP organisations, to understand how they experience the mainstreaming of social sciences. The findings contribute to debates about the politics of knowledge in organisational domains other than those focused on research, specifically EPP organisations. Evidence was found of recent positive changes in how social sciences are perceived, resourced and utilised within EPP, as well as examples of positive impact. However, although EPP organisations are recognising the opportunities that social sciences expertise brings, in practice social sciences still face barriers to effective integration. Many of the challenges faced by the social sciences within academic multi-discipline research (e.g., late, narrow, or selective enrolment) were also experienced in EPP organisations, along with some unique challenges. Informed by the findings, the paper proposes a set of integration indicators designed to assess organisational progress toward addressing the observed challenges. It is recommended that these indicators are employed at a strategic level by EPP organisations seeking to better integrate social sciences expertise into their work.

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Introduction

Since the turn of the century, there has been increasing recognition that environmental problems are largely, if not wholly, problems of and for society (Schultz and Wesley, 2011; Sandbrook et al., 2013; Mace, 2014; Marshall et al., 2017; Coglianese and Starobin, 2020; Claus, 2022; Martin-Ortega, 2023). This has led to the pursuit of policies which more firmly centre people as part of the drive to secure net zero, biodiversity and other natural environment improvements, as illustrated in several targets of the Kunming–Montreal Global Biodiversity Framework (GBF) (United Nations Convention on Biodiversity, 2022). Despite some progress, there are many calls to go further, for example: with regard to more inclusive, community-centred conservation (Armitage et al., 2020; GBF Targets 22 & 23) and natural resource management that takes account of different knowledge (Tengö et al., 2017; GBF Target 21), benefits human health (McKinnon et al., 2016; Gaston et al., 2018), and neither harms vulnerable people nor perpetuates inequality (Wyborn et al., 2021; Archer et al., 2022). As part of this trend, governmental and non-governmental Environment Policy and Practice (EPP) organisations with a historical focus on nature conservation and natural resource management increasingly, explicitly reference people in their mission and vision statements¹.

A distinct but related set of discussions within EPP is the move towards ‘evidence-based management’ and ‘evidence-based policy’ within the United Kingdom of Great Britain and Northern Ireland (UK) (Strategic Policy Making Team, 1999; Science and Technology and Committee, 2006; GO Science, HM Treasury, 2019). This marks an attempt to modernise and centre science and engineering within policy making² in a way that may be seen as impartial and objective (Adams and Sandbrook, 2013). Within the EPP space, this includes ‘evidence-based conservation’ (Sutherland et al., 2004; Dyson and Wentworth, 2011; Salafsky et al., 2019). For example, Natural England proposed to adopt an evidence-led approach as part of the implementation of its Science, Evidence and Evaluation Strategy in 2020 (Natural England, 2020) and the Royal Society for the Protection of Birds (RSPB) regards Science and Evidence as primary drivers of their work³. There is, however, disagreement about what counts as evidence in environmental policy-making, not least regarding social sciences evidence (Adams and Sandbrook, 2013). Adams and Sandbrook (2013) suggest that more value should be attached to qualitative data (provided by the social sciences and humanities) and local and indigenous knowledge and that there should be “greater recognition that policy-making is a complex and messy process and that the role of evidence in policy-making can never be neutral” (p. 329).

Attention to these themes of people-centred and evidence-based EPP implies a recognition, on the part of EPP organisations, that they need to expand their social sciences (and humanities) functions. We follow the UK’s Economic and Social Science Research Council’s definition of social science as “the study of society and the manner in which people behave and influence the world around us. Social science tells us about the world beyond our immediate experience and can help explain how our own society works—from the causes of unemployment or what helps economic growth, to how and why people vote, or what makes people happy. It provides vital information for governments and policymakers, local authorities, non-governmental organisations and others” (<https://www.ukri.org/who-we-are/esrc/what-is-social-science/>). Further, and following the Academy of Social Sciences (<https://acss.org.uk/what-is-social-science/#social-science-disciplines>), we recognise the range of social sciences disciplines; suggesting that it is more accurate to talk of the plural social sciences rather than a singular social science. The move within EPP organisations to grow social

science expertise is supported by an established body of scholarship that argues: (a) the development of more legitimate, salient, robust and effective environmental governance needs to be more extensively informed by social sciences and humanities expertise (Castree et al., 2014; Castree, 2016; Bennett et al., 2017a, 2017b; Devine-Wright et al., 2022; Gustafsson and Hysing, 2023); and, (b) that social sciences are already making valuable contributions to addressing environmental issues (e.g., Kattirtzi, 2017; Ardoin et al., 2020; Margules et al., 2020).

In response, social sciences have featured more prominently in UK EPP organisations⁴ in recent years. For example, in 2018 a Natural England Science Advisory Committee (NESAC)⁵ seminar focused on “Different forms of knowledge in decision-making for the natural environment”⁶ and in 2021 NESAC established a separate social sciences advisory committee⁷. More social scientists are being employed across EPP organisations: in 2023 Natural England has 16 social sciences specialists, compared to 2 in 2016⁸; the Department for Environment, Food & Rural Affairs (Defra) employs more than 80, compared to 20 a decade ago⁹; the Centre for Environment, Fisheries and Aquaculture created new social sciences posts in 2022¹⁰; and, in the Royal Society for the Protection of Birds’s (RSPB) Centre for Conservation Science social sciences expertise continues to grow, an explicit objective of their science strategy¹¹. In 2022 the Economic and Social Research Council (ESRC) funded a ‘hub’ to better embed social sciences in EPP called Advancing Capacity for Climate and Environmental Social Science (ACCESS)¹².

This expansion represents an important, possibly paradigmatic, shift for the social sciences. However, the process is under-investigated, particularly in a UK context. The majority of research in this area has explored social sciences *in relation to* EPP, focusing on knowledge mostly generated outside policy and practice, i.e., within research institutions, and how this knowledge can be more effectively deployed within EPP (e.g., Bastow et al., 2014a, 2014b; Marshall et al., 2017; Coglianese and Starobin, 2020). The small literature exploring social sciences *within* EPP identifies improvements to research and policy-making processes and outcomes where social scientists were involved (Kattirtzi, 2016, 2017; Eisenhauer et al., 2021). It highlights the different roles EPP social scientists take on (Phoenix et al., 2019), roles which can include the destabilisation of dominant forms of knowing to make new environmental futures possible (Claus, 2022). Other research found organisational misunderstandings regarding the various disciplines thought of as ‘social sciences’, as well as EPP organisations’ inability to make full and effective use of social sciences expertise (Bennett et al., 2017b; Eisenhauer et al., 2021). This is particularly the case within government departments, more used to dealing with natural science knowledge (Shortall, 2013).

This paper builds on this emerging body of work, in particular Bennett et al.’s (2017b) concept of ‘mainstreaming’ social sciences in conservation. Our aim is to explore the expansion of UK EPP organisations’ social sciences function (i.e., the retrospect part of the title) and to consider where there is room for improvement to enable a more ‘meaningful integration’ of the social sciences (the prospect part of the title). Meaningful integration would be achieved where social sciences are embedded in the design, implementation, monitoring, and assessment of EPP, with EPP organisations capable of making use of diverse insights from the social sciences (Bennett et al., 2017b). Knowledge of and commitment to social sciences across all aspects of organisational operations and clarity on the breadth and roles of environmental social sciences across EPP organisations would also evidence social sciences mainstreaming (Bennett et al., 2017b). We address our aim through the following two objectives: First, we examine

the state of the social sciences' function in EPP organisations and explore the factors, (potentially distinct from those in academia), enabling and constraining the mainstreaming of social sciences expertise through the reported experiences of practising social scientists within EPP organisations. Second, we draw on this empirical material to develop a set of 'integration indicators' that can be utilised by such social scientists and their EPP organisations to assess organisational progress towards the mainstreaming of social sciences expertise and identify areas for improvement.

After describing our methods, we present key themes within the empirical material, discuss how they relate to the literature and illustrate how they inform the identification of each of the integration indicators. In conclusion, we explore how the integration indicators may be utilised in the future as part of organisational efforts to reflect on and progress the mainstreaming of the social sciences in EPP organisations. It is accepted that this is likely to require the transformation of organisational agendas, cultures, and ethos (Bennett et al., 2017b).

Methods

A novel participatory action research project (after Mason, 2015; Fazey et al., 2018; Bradbury et al., 2019), was designed and delivered to explore the mainstreaming of social sciences expertise across a range of EPP organisations. Social scientists employed in these organisations (hereafter participants) and an academic social scientist collaboratively developed the project with the aim of realising impactful research¹³. Primary data were collected through four research stages: (1) semi-structured interviews and a survey, (2) deliberative workshop, (3) expert elicitation process, and (4) participant reflection and feedback sessions. Institutional ethical approval for the research was granted in March 2020. Participation was voluntary and all participants provided written informed consent.

We recruited participants through the purposive sampling of our professional networks and subsequent snowball sampling (Bryman, 2016). We aimed to include social scientists from as many EPP organisations as possible, including: (i) Defra¹⁴; (ii) government bodies that advise UK and devolved governments on the environment and carry out executive or regulatory functions — 'non-departmental public bodies'; (iii) non-government organisations who deliver for the natural environment and seek to influence government environmental policy; and, (iv) research consultancies and academics that work with/for the types of EPP organisations listed¹⁵. We asked for participation from social scientists or those who have worked extensively with the social sciences within such organisations. We wished to encourage representation from the range of social scientists working in UK EPP organisations. We also recognised that their professional journeys were likely to be different from those of academic social scientists and wished to capture this difference. As it transpired, all participants bar one held formal social sciences qualifications (see the section "Mainstreaming social sciences expertise: reported experiences and integration indicators" section for more detail). The participant without a formal social sciences qualification commissions social sciences research from qualified social scientists, thus ensuring representation from an organisation that does not employ social scientists directly.

A total of 19 participants from 11 EPP organisations contributed to the research, excluding the lead authors (CM and BFTB¹⁶), although not all participated in all research stages. Fifty-three percent of participants worked in non-departmental public bodies (Gov Agency), 16% in government departments (Gov), 16% in environmental non-government organisations (NGO), 16% in academia (Academia), and 5% in consultancy (Consultancy). Eight social scientists were involved in facilitating or

assisting across the various research stages, including the lead authors. Three of these were also active participants in the research.

Semi-structured interviews and survey. The first stage of data collection involved 14 participants (two Gov, seven Gov Agency, three NGO, one Academia, one Consultancy) from seven organisations. In 2020, nine of these participated in a semi-structured interview and five, unable to be interviewed, completed an emailed survey questionnaire. The interview and survey questions, developed by the two lead authors (CM and BFTB) and informed by ongoing discussions within a Gov Agency (Natural England) social sciences team, were the same (see Supplementary materials). Interviews were conducted via telephone or video call by one of two project team members¹⁷, using a standardised approach. Interviews ranged from 26 to 60 min duration and were recorded with interviewees' permission for full transcription.

Workshop. An online workshop in 2020 brought together 18 participants (two Gov, ten Gov Agency, three NGO, two Academia, one Consultancy) from 11 organisations. Thirteen of the 14 interview/survey participants attended the workshop. The workshop included two facilitators (the lead authors) and two note-takers and lasted five hours (including breaks). Its purpose was to further the conversation about the role of social sciences in UK EPP organisations, how this might be enhanced and to discuss evidence gaps and ways that academic research could support social sciences within participants' organisations and EPP more generally. Interview and survey data provided preliminary data on the nature and extent of social sciences expertise within EPP and some provocations to stimulate discussion. The workshop focused on the following key questions: What does it mean to be a social scientist and 'do' social sciences within an environmental organisation? What factors enable and constrain social sciences in this context? When, and why, have social sciences made a positive difference to the delivery of environmental outcomes? What needs to change to enable the more effective integration of social and natural sciences in environmental organisations? How can research/academia support this process of change? What questions should it be asking, why and how? Is there a role for a formal network of social scientists to support and promote their work within environmental organisations? (see supplementary materials).

Expert elicitation process. An online expert elicitation process in 2021 involved nine workshop participants (one Gov, five Gov Agencies, one NGO, one Academia, one Consultancy) from eight organisations, plus a lead author, who is a social scientist in an EPP organisation (BFTB). The process was adapted from the Sutherland Method of research prioritisation (Sutherland et al., 2011; Morris et al., 2021), enabling participants to review and reflect on emergent ideas, identify additional gaps, suggest and prioritise future research efforts. Participants ranked and commented on a list of research questions derived from the interview, survey and workshop data (see Supplementary materials).

Feedback and reflections. Finally, two duplicate format 60-min online discussions were run, each with two facilitators (the lead authors) and a note-taker, to discuss the prioritised research questions from the expert elicitation exercise. Further, participants were invited to reflect on the entire process and next steps. All participants were invited and eight were able to join.

Analysis of primary data. The interview transcripts, questionnaire responses, notes from the workshop, expert elicitation

process and feedback/reflection sessions were transferred into QSR NVivo (2018) to enable simultaneous analysis of all materials using a thematic approach informed by Braun and Clarke's (2006) six stage process of familiarisation; initial coding, both in-vivo and guided by the literature (e.g. qualifications, role name); collation of codes into themes (e.g. social sciences framing); review; refinement; definition and evidencing of themes. The most prominent themes are discussed below, in the section entitled 'Mainstreaming social sciences expertise: reported experiences and integration indicators'.

Development of integration indicators. Returning to the participatory action research imperative and participants' desire for this research to 'do work' within EPP organisations, we noted that participants appreciated the rare opportunity to compare and contrast the situation for social sciences between their organisations. The majority were interested in further comparative investigations of what works for social sciences in different organisations, what does not and why, and applying this knowledge to help social sciences gain further traction across EPP. To this end, all strands of primary data were used to inform the development of a set of integration indicators for use by EPP organisations as they consider how to (further) mainstream social sciences expertise. The decision to develop a set of indicators was deliberate and inspired during the iterative analysis of the multi-stage research process. Indicators are used extensively in EPP, e.g. the Outcome Indicator Framework for the 25-Year Environment Plan (Defra, 2022). This is despite attracting some criticism that their positivist basis does not recognise that social values are mutable social constructions (Slee, 2007).

We adopt Mills et al.'s (2021, p. 2) definition of an indicator as "A quantitative or qualitative factor or variable that provides a simple and reliable means to measure achievement, to reflect the changes connected to an intervention, or to help assess the performance of a development actor". Following this definition, the indicators are intended to provide a useful and straightforward means of considering and assessing organisational progress towards the integration of social sciences expertise and identifying areas for improvement. Each indicator describes a factor emerging from the analysis that is relevant to the assessment of the degree of integration of social sciences within an EPP organisation. Together, the indicators are designed to provide a breadth of coverage to enable a broad assessment of current organisational progress and identify areas for further improvement. Where sub-indicators are included, this suggests that multiple sources of data—both quantitative and qualitative—should be considered to provide a thorough assessment of the indicator, i.e. all sub-indicators should be used to provide evidence towards the indicator. Although the research and subsequent indicators are UK-based, we believe our study raises many questions about these issues in general, and that the UK context is a good case study within which to investigate them.

Limitations. Two potential methodological limitations are acknowledged. First, given that all the authors and participants in the research are social scientists with an interest in advocating the mainstreaming of social sciences expertise in EPP organisations, we acknowledge there may be concerns relating to undue influence (or 'bias'). Within an academic context, the positionality of 'academic advocate' has attracted critical reflection (Boykoff and Oonk, 2020), but there appears to be less consideration in organisational contexts beyond academia. This research builds on a wider scholarship with similar concerns, where the 'case for social sciences' is often made in the abstract rather than, as we do here, exploring the situation within particular organisational contexts.

A breadth of authorship has enabled us to work towards as objective and balanced an account as possible. The second potential limitation is the relatively small number of participants in the study. Qualitative studies, such as the one reported here, are not seeking 'representativeness' but instead aim for insight and understanding using a breadth of in-depth methods. Furthermore, participation was secured from a range of EPP organisations from different environmental sectors. However, there is clearly scope for extending the analysis to other EPP organisations; with the integration indicators explicitly developed for this purpose.

Mainstreaming social sciences expertise: reported experiences and integration indicators

This section presents the key themes from the primary data, discusses these themes in relation to the literature, and identifies and discusses the integration indicators and sub-indicators developed in relation to one or more of the themes (see Table 1). The data themes are the academic and professional backgrounds of participants and their roles; participant EPP organisations' social sciences capacity; the positioning of the social sciences within participant EPP organisations' knowledge hierarchies; and organisational framings of the social sciences. These reveal how participants experience the mainstreaming of, or limitations to the mainstreaming of social sciences expertise in practice.

Academic and professional backgrounds of participant social scientists. Participants' academic backgrounds, current job titles and descriptions provide initial insight into the status of social sciences and social scientists within their organisations. They had diverse disciplinary backgrounds and natural sciences featured more prominently than might have been expected. Alongside (later) social sciences qualifications, 8 out of the 14 had undergraduate degrees in natural sciences, including environmental science, conservation, zoology, geology, engineering, biology, agriculture, and soil science. This may indicate organisational preferences for employing social scientists with natural science backgrounds. All but one participants subsequently obtained at least one social sciences qualification, which was described as transforming how they framed environmental problems: "when you're into conservation ... it was a revelation that it's all down to people" [Gov Agency 2]. Participants reported a diversity of social sciences qualifications covering environmental economics, human geography, social and environmental anthropology, psychology (organisational and environmental), sociology, behavioural science, social research and social research evaluation. However, the degree to which these specialisms were mobilised in their current role was variable. Two participants did not identify strongly with any discipline, regarding themselves as a "jack of all trades" [Gov Agency 2] and a "generalist social researcher" [Gov Agency 4]. Others regarded themselves as 'environmental scientists' and 'environmental social scientists', whose work drew on several disciplines.

Having a natural science background was considered to have positives and negatives. Being able to speak the same language as natural scientists in interdisciplinary teams was seen as an advantage, as was interacting confidently with a breadth of disciplines [Gov Agency 3 and 8] which speaks to Collins and Evans' (2002) concept of interactional expertise. A disadvantage of having a mixed—natural and social sciences—academic background, for some participants, was that they felt out of their depth with senior academic social scientists, with one explaining: "We have some work on behavioural change and social practice, for instance, and I just realised I couldn't cut it

Table 1 Integration indicators and sub-indicators.

Indicator title and number	Sub indicator(s)
1. Social sciences capacity	1a Role permanency 1b Role description 1c Role grade 1d Range of social sciences disciplines 1e Percentage of social scientists with a natural science background 1f Subject expertise 1g Allocated funding 1h Externally commissioned social sciences input 1i Career development opportunities 1j Capability development for non social sciences colleagues 1k Growth trajectory (number of roles over time)
2. Range of roles undertaken by social scientists	2a Contribution of social scientists to high-level strategy and impactful work. 2b Freedom to try out other roles.
3. How much social sciences social scientists get to do	
4. Interdisciplinary working	4a What is/are the role(s) of social sciences? 4b Are social sciences initiating such work? If not, how early are social sciences brought into projects/work? 4c Can the organisation accommodate “multiple and conflicting epistemic perspectives which are reshaped over time” (Kattirtzi, 2017, p. vii)?
5. Professional regard	5a What are the positions of social sciences within hierarchies of knowledge? 5b Are non-social scientists being asked to undertake social sciences work?
6. Reach and influence of social sciences within organisation	6a What parts of the organisation are engaged in social sciences and in what ways? 6b What types of questions/issues are social scientists asked to engage with? / From what areas of enquiry are they excluded? 6c Are social scientists involved in identifying and framing those questions? 6d Are social scientists allowed/encouraged to provide training to colleagues? How many non social sciences colleagues have undertaken social sciences-related training (in-house or external)? 6e Is there recognition that different social sciences disciplines may ask different questions and reach different conclusions? 6f What are the number of senior social sciences roles and the number of senior roles occupied by those with a social sciences background?
7. Impact of social sciences within organisation	7a Is impact recognised in all its forms? (after Edwards and Meagher, 2020). 7b Is this learning institutionalised? 7c Is the role of social sciences (or lack of) in policy and practice failure explored?
8. Professionalisation of social sciences within the organisation	8a Number of social scientists chartered or other (e.g. badged Government Social Researchers) 8b Are social scientists able to publish their work in peer-reviewed journals (without excessive gate-keeping)?

with a proper sociology professor. I just couldn't ... interact” [Gov Agency 3].

Our findings about the academic backgrounds of participants inform the development of Indicator 1—Social sciences capacity—that is elaborated on in the next section. Specifically, Role description, Range of social science disciplines, and Percentage of social scientists with a natural science background are identified as important sub-indicators. With respect to the latter sub-indicator (1e), this is judged as neither a good or a bad feature but instead may enable an EPP organisation to recognise a stage in their journey to mainstreaming social sciences when social sciences work is undertaken by interdisciplinarians already employed by the organisation.

Social sciences capacity. Bennett et al. (2017b) indicate lack of capacity is one of the key barriers to mainstreaming social sciences in conservation and outline a range of actions that can be taken to address this. We also found that social sciences capacity is indicative of EPP mainstreaming of social sciences expertise. Participants were aware of more social scientists being employed, greater visibility for social sciences within their organisations, more people-oriented initiatives and new areas of work opening up. As one put it: “We are being kind of pulled into areas of work

where we've been pushing for years to get in and making very little headway. So that's been really exciting” [Gov Agency 1]. But this recent scaling up has been from a very low base and is highly variable within and between organisations. For example, a participant described championing proper survey design to “get the senior leaders to understand why we needed to resource it and what a dog's dinner it had ended up as with no resource” [Gov Agency 5]. In general, participants doubted that adequate social sciences resources were available within EPP organisations to enable its potential value to be fully realised. The situation for participants in the public sector was relatively better than in NGOs, but an experienced social scientist working for a government agency [Gov Agency 5], indicated that social sciences resourcing remained precarious. They had witnessed the social sciences falling in and out of favour over time due to changing government priorities and it is only recently that agencies have moved beyond having “a very small amount of social science resource”.

When asked how many social scientists currently work in their organisations, one participant from a government department [Gov 2] reported that there was now “quite a lot”, including 12 working on one particular policy programme. Being in a bigger social sciences team enabled them to be “much more of a specialist than I might otherwise have been allowed”. Others

presented another picture: “I am the only government social researcher within the [name of government agency]. There are lots of people with evidence backgrounds, but these are more from a physical science perspective” [Gov Agency 4]. In their team of around 15 people, one government agency participant believed that only “maybe one or two would actually be social scientists” and this represents a “weakness that the organisation has had for some time” [Gov Agency 1]. Another government agency participant reflected that “We don’t get the time to really think, reflect and think about our strategies and tactics, I guess, in terms of how to deliver social science” [Gov Agency 5]. Meanwhile, in one NGO it was reported that “we have a whole Science Division in [name of NGO] and there are no social scientists at all” [NGO 1].

No participant disputed the need for more capacity to better incorporate the breadth of social sciences. However, some NGOs’ lack of in-house “straight-up social scientists” [NGO 1] did not necessarily signal that they were completely closed to social sciences expertise. External social sciences resource (usually behavioural scientists) is sometimes commissioned. However, there was concern that those undertaking the commissioning did not have appropriate expertise and such commissioning was at the expense of building much-needed internal capacity. A participant from a government agency had a different perspective on external commissioning: “we have an excellent reach externally. So, you know, partnering with those who have expertise where ... there are gaps [in social sciences] internally, I don’t think is an issue” [Gov Agency 7].

Together with the information about participants’ academic backgrounds, the evidence presented in this sub-section enabled identification and development of Indicator 1—Social sciences capacity—and informed Indicator 3—How much social science social scientists get to do. The latter indicator addresses the proportion of roles allocated to social sciences which includes time to reflect on and develop the roles and contribution social sciences could be playing within the organisation (see Indicator 2) and time to innovate. Claus (2022), in her examination of the mainstreaming of social sciences in trans-national conservation NGOs, noted a lack of resourcing thwarting social sciences in several ways, including relatively lower visibility preventing access to further organisational resources. Capacity, as described by Bennett et al. (2017b, p. 60), and by our participants, is more complex than purely the number of people employed in a social sciences role: “Simply doing more social science will not necessarily lead to better conservation unless that social science is assimilated into a hospitable environment”. Within integration Indicator 1, lack of capacity is indicated by number of staff with social sciences training, and the breadth of disciplines and subject areas they are expected to cover. These are reflected through the inclusion of associated Sub-indicators 1a–1k. We also found issues of capacity inhibit social scientists’ ability to improve the impact of their discipline within EPP, as reflected in Indicator 5—Impact.

Social scientists’ roles within EPP organisations. Participants’ job titles (provided by 13) were indicative of the range of roles and seniority held within their organisations. Some had had long and diverse careers across local and national government, public bodies, academia, the third sector and consultancies. Although five titles included the word ‘social’, and two, ‘people’, the remaining six had neither. Two titles referenced ‘conservation scientist’, a naming that might reflect a deliberate attempt to situate social science under the broader (and possibly more inclusive) banner of ‘conservation science’. Except for one participant, who was a consultant, all those with ‘social’ or ‘people’ in

their titles worked in government or government bodies. None of the three NGO participants’ titles were framed in this way. In most of the participant organisations ‘social science’ is separated from economics and therefore forms a distinct function perhaps recognising the central role economics has and continues to play in EPP organisations, in contrast to the other social sciences. Although an interesting point, this is not one we explored directly.

Most participants’ work involved engaging in and/or commissioning research in a leading or supporting role, undertaking evaluations, and reformulating evidence into more accessible forms for internal or external audiences. Other roles included providing evidence to policy colleagues (either self-directed or commissioned), developing methods, supporting NGO conservation policy advocacy work, and project management. Some participants also advocated for and provided guidance on integrating and promoting social sciences within their organisations: “I think we do need to be confident and shouting out [sic] when those [social] perspectives are what they need to hear” [Gov Agency 3]. Regarding the government’s tendency to view nature as a natural science problem, a participant thought of their role as being to “challenge that where I see it happening and ask why we’re not looking at these different [social sciences] viewpoints” [Gov Agency 1].

Some participants admitted to a lack of social sciences in their roles. One NGO, for example, had no defined social sciences roles: “I do kind of policy and advocacy work on UK policy, but also just occasionally dipping into other things. So sometimes I do a small bit for the sustainable diet team with more of that kind of social science lens, but nothing particularly official or large” [NGO 1]. In another case, the participant’s organisation went through a stage when “they didn’t know what to do with us quite honestly” [Gov Agency 6]. Even now, there are no social sciences in their role, other than translating external evidence for colleagues. Others had insufficient time for social sciences work, because “time has been taken up with kind of project management type activities” [Gov 2].

Work topics provided further insight into participants’ roles. For example, some specialised in water quality and water supply policy or land manager behaviours; others worked on a wide variety of topic areas. What was most frequently mentioned (by five participants) was connecting people to nature, and its associated health and wellbeing benefits. For one organisation this was linked to a “social inclusion” agenda about understanding inequalities in accessing and engaging with the environment [Gov Agency 7]. Before an internal review of the role of social sciences in their organisation, a participant reported that social sciences were only conceived in terms of connecting people to nature and their organisation had no vision of how social sciences “might apply across all of our areas of work” [Gov Agency 6].

As in academia, EPP organisations often cast social sciences in a supportive role. Our research found that social sciences in EPP organisations were mainly confined to instrumental contributions which is one among the “ten distinct contributions that the social sciences can make to understanding and improving conservation” (Bennett et al. 2017a, p. 93). Social scientists were described by one participant as having a diagnostic function within their organisation: they “can look at a situation and can identify certain problematic [social] dynamics and then draw people’s attention to them. And help facilitate a collective solution to the problem” [Gov 2]. Overall, participants were keen to perform a wider range of roles including ‘critical friend’ or ‘disruptor’ which Claus (2022) identified as important in “making new environmental futures possible” (p274). These roles are akin to the ‘challenge function’ elaborated in Kattirtzi’s (2016) account of social sciences in the UK government’s Department for Energy and

Climate Change (DECC). Such a role requires meaningful opportunities to pose fundamental questions about the operation of power in society, vested interests and inequality and how these are key to explaining the causes of environmental problems as well as signalling environmental solutions. Providing social scientists with more time and space to reflect on the roles social sciences could play within their organisations was also raised several times by participants.

Kattirtzi (2017) illustrates the positive outcomes that can follow from a fuller integration of social scientists into environmental policy activities, rather than just the application of social sciences skills and knowledge to existing activity (Eisenhauer et al., 2021). Other research supports the assertion of a range of alternative, more fulsome roles for social scientific expertise in scientific research programmes (Morris et al., 2019), facilitated by its early engagement in research development (Castree et al., 2014; Balmer et al., 2015; Eisenhauer et al., 2021).

The integration indicators, and constituent sub-indicators, that follow from these insights address the Range of roles that could be performed by EPP social scientists (Indicator 2) and How much social science social scientists get to do (Indicator 3). They reflect elements of the capacity, institutional and ideological barriers to mainstreaming identified by Bennett et al. (2017b) and, more specifically, adopt and adjust Bennett et al.'s (2017a) list of 10 distinct contributions of social sciences: Descriptive; Diagnostic; Disruptive/Critical Challenge; Reflexive; Generative; Innovative; Instrumental/Delivery; Training/Capability building; Translational; Inspirational leadership. Comparing the roles undertaken by social scientists in a specific EPP organisation against this list would comprise an initial task when deploying the Range of roles Indicator 2.

These indicators (together with Indicator 6—Interdisciplinary Working) are also informed by scholarship that has revealed the constraints on social sciences roles within multi/interdisciplinary research projects and programmes (Castree et al., 2014; Morris et al., 2019; Hakkarainen et al., 2020; Markusson et al., 2020; Martin, 2020; Martin-Ortega, 2023).

Knowledge hierarchies and social sciences. The majority of participants endorsed multi and interdisciplinary working but faced numerous challenges. For example, some doubted the willingness of colleagues from other disciplines to take social sciences perspectives on board: “I have found that not everyone is as open to learning from social science disciplines” [NGO 2]. Social sciences were regarded by colleagues as “subjective” [Gov Agency 5] and “not really a science tool” [Gov Agency 7]. “Despite positive intentions, I have observed that there remains a presumption that applying ecological/natural science approaches/ideologies to social science research is ‘correct’” [NGO 3]. Sometimes, it was reported, that their involvement in projects was tantamount to box-ticking.

Participants reported that their organisations’ support for social sciences research was insufficient: “Social science research can be disadvantaged when competing against ecological research for internal funding because it is less well-understood by senior managers who are making the decisions” [NGO 3]. When decisions need to be made quickly, organisations defer to familiar solutions, i.e. those grounded in natural science. The EPP knowledge hierarchy, in which the natural sciences are positioned above the social sciences was compared with university culture: “social scientists would be the butt of all of the natural scientists’ jokes in the pecking order and that sort of thing. And, you know, it’s stuck with people ... [when they go on to work outside academia]” [Gov Agency 1].

Participants were also struck by the natural sciences’ relative power and their refusal to accept the political implications of that.

Reference was made to co-authoring “a paper ... using social science techniques to reveal sources of bias and conflict in environmental issues ... trying to look at the sort of hidden values and framings that people were using in the way that they spoke about [the issue]” [Gov Agency 7]. The aim was to challenge the omission of “bias and power relations” within scientific discourse. The requirement for civil servants to be apolitical represented another constraint on what are considered to be acceptable research subjects, questions and methods: “It does feel like there’s a bit of a space in terms of what social science says about what the overall landscape of Britain should look like, and what would be a sustainable socio-cultural landscape in this country ... [but that] is not something that the social sciences could provide because ultimately, that’s a political choice” [Gov 2].

Participants also cited their organisations’ preferences for quantitative rather than qualitative methods, as an embedded practice practical for decision-making. For example, it was noticed the “demand for evidence, which is set out in a very specific sort of way. And what that means is spreadsheets. What that means is, is graphs. What that means is, is stats” [Gov 2]. Certain procedures and structures underpinned their organisations’ choice of quantitative methods. Evaluation frameworks, for example, “tend to be rooted in quantifiable measures” [Gov Agency 1] and “...good quantitative data is very useful for demonstrating in a court of law or in a kind of journalistic context, that you’ve delivered a valuable impact on society with public money And we are still in a situation where the, I guess the kind of end customers for a lot of evidence in the society like statistics, because they’re kind of science flavoured” [Gov 2].

Although participants observed some support for qualitative social sciences research in EPP organisations, they believe their colleagues find it harder to translate into policy and practice decisions. Scepticism persists about qualitative methods’ lack of rigour: “So in-depth interviews of a small number of people to reveal issues which, you know, immediately dismissed by scientists as “well, you didn’t interview enough people—you need thousands of people” [Gov Agency 1]. One conjectured that because qualitative social science “probes more deeply and gains richer, more profound insights, it may be seen as excessively challenging to the status quo: editorial gatekeeping and even censorship become an issue” [Consultancy 1].

The conspicuous preference for economics over other social sciences also reinforced knowledge hierarchies. A number of participants reported that there is a prevailing perception “that economics is sufficient in its own right and that it can tell you everything that you need to know about human behaviour” [Gov 2]. Economists were seen to get better access to key stakeholders “like the Treasury, for example, like Number 10” which can “make their perspectives more dominant” [Gov 2]. Such influence relates to organisational processes built around financial concerns. “A lot of how the government plans its activities is monetarily based ... because economists deal with money and deal with resources ... they are ... experiencing a certain kind of leverage that other scientists, other sciences don’t possess” [Gov 2].

Bennett et al. (2017b, p. 60) do not specifically discuss knowledge hierarchies but observe how “misunderstanding and lack of early involvement in projects undermines the potential contributions of social science and interdisciplinary conservation science to produce better science or provide more complete solutions” and outlines how conservation cultures are often predisposed to value the natural sciences and may even feel threatened by the social sciences. Claus (2022) found social scientists engaging in ‘hidden labour’ as they sought to “disrupt hegemonic ways of conceptualising and practising conservation” (p. 268), an inherently political and undervalued role that social

sciences undertake to advance their organisations' aims. She also found conservation social scientists "collaborating in asymmetrical interdisciplinarity" (p. 268).

Our evidence about the operation of knowledge hierarchies in EPP organisations led to the identification of integration Indicators 4–7 that address Interdisciplinary working, Professional regard, Reach and Influence, and Impact¹⁸ of social sciences in the EPP organisation, while providing further evidence to support the relevance of Indicators 1–3 that have already been identified.

Other framings of social sciences. In addition to the challenges to mainstreaming described in the previous sections, participants identified how organisational framings of social sciences can be a cause of frustration. One concern was that social sciences expertise can be overlooked, regarded as irrelevant to a particular policy issue or problem and that participants' preferred social sciences framings of problems are ignored. This speaks to the Professional regard that social sciences are held in (Indicator 5) and their Reach and influence (Indicator 6). Until relatively recently, it was claimed, government overlooked the social dimension of climate change, "even though climate change is man-made" [Gov Agency 5]. It was only recently that EPP organisations framed conservation through an environmental justice agenda that acknowledges that "the use of land and the benefits that people draw from it, including the state of nature as a result of that, is really about distribution of costs and benefits" [Gov Agency 1]. Moreover, despite EPP's emerging focus on people, aspects such as culture, social practices and behaviours were still not properly considered or understood.

Participants were also aware that social sciences expertise was misunderstood, not least the perception that social sciences are just a matter of "common sense" [NGO 1, Gov Agency 5]: "people just are not aware of this close knowledge behind that [behaviour change], or there are biases and that kind of thing. So, I think people just think they can do it themselves if they think about it at all" [NGO 1]. This speaks, again, to the professional regard within which social sciences are held (Indicator 5). Bennett et al. (2017b) also flagged social sciences as misunderstood and Kattirtzi (2017) found, within the UK government, that civil servants' lack of familiarity with social researchers' professional standards allowed 'non-experts' to lead social sciences-oriented or -led projects. This lack of professional regard (Indicator 5) has acted as a constraint on the mainstreaming of social sciences within EPP organisations and speaks to the erroneous assumptions that social sciences can be undertaken by those without formal training (Keith et al., 2022) and that social sciences qualifications are not considered a prerequisite by natural resource agencies, even when insights into social context are being pursued (Syme, 1997; Martin, 2020).

Participants expressed frustration at being positioned as generalists by their organisation: "there doesn't seem to be much awareness within the government that you really do want experts on a specific topic to be working on that topic. It seems to be like, 'Oh, we can just get another social scientist to work on this' even if they previously haven't worked on this same subject area at all ... it ignores the fact that subject knowledge is a thing" [Gov 2]. This concurs with the findings of previous research, for example, Kattirtzi's (2017) examination of social research capacity and influence within Defra found that this department valued its social scientists' skills more highly than their topic-specific knowledge. This is consistent with civil servants being incentivized to regularly change posts in order to progress in their careers (Sasse and Norris, 2019) a path that prioritises transferable skills over specialist knowledge. This markedly

contrasts with what government values in its external advisors namely, "significant knowledge in an area of expertise, a level of seniority and sufficient 'eminence' to enable that knowledge to be influential and a degree of independence from those tasked with making policy decisions" (Cooper, 2016, p. 1). It also diverges from government recommendations that staff "Specialise; focus on your strengths; become the expert, become the best in the world at what you do. Don't flit around" (Hancock, 2016).

A third consideration raised by participants is that the failure of EPP organisations to use appropriate social sciences expertise can negatively impact policy outcomes: "they deliver it and it doesn't work, and the government has wasted millions of pounds of taxpayers' money and thousands and thousands of man hours" [Gov 2]. One shared example referred to an agricultural initiative that neglected farmers' perspectives when introducing new technologies and practices. It had been assumed that farmers would just adopt those technologies and practices and the participant's colleagues didn't understand "why farmers decide to do different things" [Academia 1], actions that would be revealed through social sciences expertise. This was echoed by other comments: "conservation tends to take the view that, you know ... if people don't agree with what we're [the agency are] advocating, then it must be for a lack of evidence" [Gov Agency 1], also known as the 'information-deficit fallacy' (Toomey et al., 2017). This speaks to Indicators 6—Reach and Influence—and 7—Impact.

Participants expressed some frustration with the terms of their enrolment into projects, in particular, social science's positioning as a "bolt-on" [NGO 1]; being brought in towards the end of a project "once all the design has been done ... to 'socialise' the project" [Gov Agency 8]. Speaking directly to the Interdisciplinary indicator (4) a participant recalled how "you were always involved as an afterthought when things were too developed... and that ranges from the technical advice you give around methods, so you know, 'sort this questionnaire out because it's a bit rubbish' right through to not being involved at the right stage" [Gov Agency 6]. However, other participants had witnessed positive improvements over the past decade: "we are well past being asked to be facilitators" [Gov Agency 2]. It was acknowledged that many "newer leaders and younger policymakers" recognised the value of bringing in social sciences insight and evidence earlier in the process [Gov 2].

Speaking to the roles social scientists undertake (Indicator 2) and the Reach and Influence of social sciences (Indicator 6), several participants noted a widespread misconception within their organisations that social sciences are solely about and for behaviour change and social sciences are (only) behavioural science. "[Name of organisation] latched on to behaviour change 'because that's the thing that social scientists do'. So, me and [NAME of another social scientist] were dragged into the strand of work around ... behaviour change" [Gov Agency 6]. Hallsworth (2023) also observed the increasing reliance on the behavioural sciences within the public and private sectors. He notes the positive impact of this type of social science, but also that it will need to evolve, for example, to be able to deal with 'cross-scale behaviours' and wider social context, if it is to achieve its potential.

Despite the Academy of Social Sciences (UK) listing 48 social science society members¹⁹ and a number of natural science societies, such as the Society for Conservation Biology, actively welcoming social scientist members²⁰, when asked about professional memberships, three participants expressed a feeling that there was not an obvious 'home' for social scientists working in EPP organisations: "I haven't found a home yet. I've looked at loads of professional organisations but haven't found anything that I'd like to join" [Gov Agency 1]. With 5 participants holding

no professional membership. Study data suggests that the breadth of the subjects they engage with and the disciplines they are asked to perform may play some role in this sense of ‘homelessness’. All of those working for a government department were members of the Government Social Research (GSR) Profession²¹, as were three from a government agency. Membership of GSR is via role recruitment or via a ‘badging route’ skills test. Membership was not felt to be accessible or appropriate for all government agency participants and there was discussion about how useful it was for some social scientist roles. Other professional memberships, fellowships and charterships were with a wide variety of organisations, including the Royal Anthropological Institute, the Royal Geographical Society, the Society for Conservation Biology, the British Psychological Society, and the British Sociological Association. These insights led to the identification of Indicator (8) relating to the Professionalisation of social sciences. Within the workshop, there was a discussion about ‘gate-keeping’ as a barrier to increasing the profile of social sciences and the Consultancy participant raised the issue of finding it hard to publish social sciences research undertaken within EPP organisations. This is reflected in Sub-indicator 8b.

Conclusion. This paper has investigated mainstreaming of social sciences expertise within EPP organisations, as experienced by social scientists within those organisations and the future they aspire to for the social sciences. We took inspiration from Bennett et al. (2017b) who recommend ‘6 practical steps’ to mainstreaming social sciences. However, we recognise a prior step to action—understanding how well integrated social sciences are already—recognising each EPP organisation will be at a different point in the journey towards integration. Indeed, Bennett et al. (2017b, p. 63) acknowledge that the scope and scale of social sciences engagement within such organisations is not clear and “A review of how, at what stages, and the extent and efficacy with which conservation organisations of different sizes use the social sciences ... would be an insightful endeavour”. Through a multi-stage, participatory action research project, we identified and explored key themes relevant to the integration of social sciences in EPP organisations, including academic and professional backgrounds and roles; EPP organisations’ social sciences capacity; positioning of social sciences within EPP organisations’ knowledge hierarchies; and organisational framings of social sciences.

We noted that some of the challenges, or frustrations, around the mainstreaming of social sciences within EPP organisations differ from those observed in academic research contexts. This may partly be explained by the multiple functions attributed to social scientists in EPP organisations, as opposed to those in research institutions. Another difference between EPP and academia is the, perhaps inevitable, reluctance of EPP organisations to embrace the more explicitly political character of much social science. The historic dominance of natural sciences in EPP has led to a depoliticised scientific ‘evidence-based’ approach²². In contrast, the social sciences uncomfortably insist on recognising the role of politics, economics, and ethics (etc.) in translating and using evidence (Adams and Sandbrook, 2013; Wyborn et al., 2021; Claus, 2022).

Informed by the primary data findings, this paper has developed a set of integration indicators for use by EPP organisations as they consider how to (further) mainstream social sciences expertise.

We are mindful that the weight of assessing and encouraging the integration of social sciences should not fall solely on the shoulders of individual social scientists, as part of a ‘responsibilizing’ tactic (Evans et al., 2017), but rather should form part of

their organisations’ institutional arrangements (Bailey, 2011; Michael Kattirtzi, 2016; Evans et al., 2017). In other words, EPP organisations will need to make “multilayered commitments to bureaucratic, ideological, and structural changes” (Claus, 2022, p. 269) and organisations may be required “to revisit their theory of change and, while doing so, to examine where social science insights may be useful” (Bennett et al., 2017b, p. 63).

In recommending these indicators, we draw on the concept of ‘institutional reflexivity’, defined as “the ability of institutions to generate knowledge, reflexively appropriated” (Slantcheva, 2004, p. 257). Tantalisingly, recent unpublished research, led by social scientists in Natural England, has highlighted how institutional reflexivity, practised through organisational learning and centring the social sciences, can contribute towards such organisations becoming ‘evidence led’ (J Hoggett, pers. comm.). An EPP organisation that exhibits greater levels of institutional reflexivity might be one in which social sciences are mainstreamed more quickly and effectively, although this remains a matter for future research. Ultimately it is hoped that the integration indicators will help EPP organisations to avoid complacency and ensure that progress in enabling the social sciences to contribute to addressing our environmental crises is sustained and improved upon. To this end, since the completion of the original research, the authors have started work with a number of EPP organisations who wish to test the utility of the indicators; using them as a starting point for assessing progress (positive or negative) toward EPP organisations’ mainstreaming of social sciences. It is anticipated that through testing, the integration indicators will be refined and adapted over time and for different situations and trajectories. Following this further research, we plan to publish more details on the indicators, including how they might best be measured and their outcomes.

Data availability

The qualitative datasets (from interview, survey, workshop and expert elicitation) generated during the reported study are not publicly available due to the small number of participant social scientists practising in some EPP organisations and the specific nature of their work, which is discussed in their interview/survey transcripts, during the workshop and in the comments of the expert elicitation exercise. Any disclosure would risk the identification of those participants.

Received: 21 March 2023; Accepted: 28 February 2024;

Published online: 12 March 2024

Notes

- For example: Natural England’s vision and mission is “Thriving Nature for people and planet” achieved through “Building partnerships for Nature’s recovery” (<https://www.gov.uk/government/organisations/natural-england/about#:~:text=Our%20purpose%20is%20to%20help,thereby%20contributing%20to%20sustainable%20development>); NatureScot’s purpose includes “help people to enjoy nature responsibly” and “enable greater understanding and awareness of nature” (<https://www.nature.scot/about-naturescot/our-work/what-we-do#:~:text=NatureScot%20is%20the%20lead%20public,people%20to%20enjoy%20nature%20responsibly>); WWF’s mission is to “is to build a future in which people live in harmony with nature” (<https://www.wwf.org.uk/jobs/our-values>).
- Realising our ambition through science—GOV.UK (www.gov.uk).
- <https://www.rspb.org.uk/about-the-rspb/about-us/our-mission/>.
- These organisations hold various roles which may include regulation, advising/informing, influencing/advocating, developing, delivering, analysing and evaluating natural environment policy. They include non-departmental public bodies (e.g. Natural England, Natural Resources Wales, NatureScot (formally Scottish Natural Heritage), the Environment Agency, Forest Research and the Marine Management Organisation), departments of government (notably the Department for

- Environment, Food and Rural Affairs (Defra) and its devolved equivalents) and third sector, non-government environmental organisations, such as the Royal Society for the Protection of Birds (RSPB) and World Wildlife Fund (WWF), who advocate for particular policy direction and in some cases support policy delivery via engagement with policy tools.
- 5 Our governance - Natural England - GOV.UK (www.gov.uk).
 - 6 Darlow A (2018) Internal Natural England document.
 - 7 Terms of Reference: Social Science Expert Panel (SSEP) of the Natural England Scientific Advisory Committee (NESAC) (publishing.service.gov.uk).
 - 8 Cardinal I, pers comm.
 - 9 Allen C, pers comm.
 - 10 Lucas C, pers comm.
 - 11 Hughes J, pers comm.
 - 12 <https://www.ukri.org/news/social-sciences-to-play-vital-role-in-meeting-uks-net-zero-goals/> For an explanation of the various roles social sciences are enlisted into, see this presentation from the ACCESS annual assembly (2023) by one of the authors (Beth Brockett) and a project participant <https://youtu.be/ep5vZE0S4Yc>.
 - 13 The research was funded by the ESRC's Impact Acceleration Account (<https://www.ukri.org/what-we-offer/supporting-collaboration/supporting-collaboration-esrc/impact-acceleration-accounts/>). UK researchers are increasingly encouraged to engage with the 'impact agenda', to design and deliver research with societal impact.
 - 14 UK Government department responsible for most natural environment content, working in cooperation with devolved national governments.
 - 15 In recognition of the global variation in how governments operate, we include this brief explanation "UK policymakers are part of the civil service – a politically impartial permanent body, who make evidence-based recommendations to Ministers, and can be redeployed to different departments at short notice depending on workload. Trained as generalists, policymakers are often reliant on outsourcing to get answers to technical questions" (Porter and Clark, 2023, p. 87). These answers or insights could be from scientists (or other analysts) within their own government departments, from non-departmental government bodies, or from externally commissioned research.
 - 16 CM are an academic who has worked extensively with EPPs and BFTB works for an EPP organisation.
 - 17 EPP organisation social scientists.
 - 18 Distinct from the 'Reach and Influence' indicator, the 'Impact' indicator focuses on to what extent social sciences products and other outputs are utilised by the organisation (and other 'customers') and to what effect.
 - 19 <https://acss.org.uk/social-science-societies/>.
 - 20 <https://conbio.org/membership/about-scb-membership/individual-membership>
 - 21 Government Social Research Profession—GOV.UK (www.gov.uk).
 - 22 We are not suggesting that non-social evidence is apolitical or value-free and recognise that all evidence involves value judgements and political choices. Our point is that within EPP organisations historically there has not been this same recognition.
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Acknowledgements

We extend particular thanks to Ashley Lewis and Shannon Green for their research assistance and to the EPP social scientists for their participation in the research, including Dr. Emma McKinley. The Economic and Social Research Council's Impact Acceleration Account (Grant number ES/T501992/1) generously funded the research.

Author contributions

Carol Morris—Project principal investigator and lead author—drafted the manuscript; shared the rewriting process with Beth Brockett, Sara Selwood, Victoria Carr. Beth Brockett—Project co-investigator and lead author—drafted the manuscript with Carol Morris; shared the rewriting process with Carol Morris, Sara Selwood, Victoria Carr. Sara Selwood—Contributed to the literature review; took a major role in editing the revised version of the manuscript. Victoria Carr—Project participant; took a major role in rewriting all sections of the manuscript. Jilly Hall—Project participant; contributed to the writing of the initial version of the manuscript. Joelene Hughes—Project participant; contributed to the writing of the initial version of the manuscript. Bianca Ambrose-Oji—Project participant; contributed to the writing of the initial version of the manuscript.

Competing interests

The authors declare no competing interests.

Ethical approval

Institutional ethical approval for the research was granted in March 2020 from the School of Geography, University of Nottingham.

Informed consent

Participation was voluntary and all participants provided written informed consent.

Additional information

Supplementary information The online version contains supplementary material available at <https://doi.org/10.1057/s41599-024-02891-z>.

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