

# A global analysis of factors predicting conservationists' values

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## Abstract

1. There exists a wealth of philosophical, sociological and anthropological literature on environmental values; yet, few studies have investigated the values held by conservationists themselves, and how these shape the conservation movement.
2. Here, we present the first global analysis of the relationships between conservationists' values and a broad range of conservationists' characteristics, categorised into their educational and professional background, geographical context and personal experiences in childhood and adulthood. We draw on survey responses from 9264 conservationists from 149 countries to conduct the broadest analysis to date of what factors are associated with the values of conservationists.
3. Our results demonstrate that 13 characteristics of conservationists' personal and professional backgrounds are statistically related to their values regarding the place of people, science, capitalism and nonhuman entities in conservation. Of these characteristics, educational specialism and continent of nationality had the highest predictive power. We also draw on open-text responses to uncover other factors that conservationists identify as having been important in shaping their values; travel and religion were the most commonly reported.
4. Our findings have important implications for current debates on diversity and inclusion within the conservation community. In particular, we provide broad empirical evidence that increasing personal and professional diversity in conservation organisations is likely to also increase the range of values represented. We also discuss the implications of our results for interdisciplinarity, the management of disagreement and conflict in conservation, and the training of future generations of conservationists.

## KEYWORDS

conflict, diversity, education, ethics, perspectives, place

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## 1 | INTRODUCTION

Conservation is a mission-oriented discipline in which values play a central role (Noss, 2007). Understanding the values of conservationists and other stakeholders is therefore an important objective for conservation research (Bruskotter et al., 2019). Studies on the roles of values in conservation lie within the broader field of environmental values (e.g. Dietz et al., 2005; Satterfield & Kalof, 2005). Research in this field has ranged from the philosophical, most notably the question of whether biological diversity possesses intrinsic value (e.g. Cahen, 1988; Callicott, 1984), to the sociological, anthropological and psychological, which explore the range of environmental values that exist at the levels of both individuals and populations (e.g. Kempton et al., 1995; Schultz et al., 2005).

The word 'value' has different, although related, meanings in the English language, and different environmental and conservation studies have adopted different definitions. In environmental philosophy, to say that something has value usually means that it is in some way good (James, 2016). In this sense, 'value' refers to the goodness or worth of some natural entity. 'Value' as the worth of something is also the meaning of the word used in economics (e.g. when it is said that an ecosystem has monetary value). Note that in this paper we are interested in exploring *conservationists'* values; that is, *their* conceptions of what is valuable—we do not make any normative claims about whether we think such things in fact have value. But the word 'values' can also refer to someone's moral principles, their guiding notions of what is right and wrong (note the shift from goodness to *rightness*). Although distinct, these two meanings of the word share common ground (Kempton et al., 1995): someone's judgement that a natural entity is good (first definition) will likely shape how they think humans should behave towards it (second definition). In this paper, we will consider values in both senses of the word. Where necessary, we will specify whether we are referring to conservationists' conceptions of what is good or to their moral principles. We will not provide such clarifications where context makes the meaning of the word unambiguous or when we wish to refer to *both* meanings of the word (as in the first sentence of the following paragraph).

Many researchers have sought to understand the role of values in conservation by investigating the values of relevant groups of people, such as resource users or citizens in a particular jurisdiction. Much of this work has been based on the typology of value orientations proposed by Schwartz and colleagues, which categorises human-nature relations into those driven by either mastery or harmony values (Schwartz, 2006). Researchers have adapted this typology to identify the prevalence and distribution of values in relation to wildlife in the United States (Teel & Manfredo, 2010) and beyond (Teel et al., 2007), to explore how societal modernisation influences such values (Dietsch et al., 2016), to demonstrate that preferences for different ecosystem services in fishing communities are underlain by a variety of human values (Hicks et al., 2015), and to argue that although values may shift with changes in socioecological conditions, broad societal values cannot easily be changed by external agents to advance conservation goals (Manfredo et al., 2017, 2021).

Fewer studies have considered the values of individuals who are directly involved in the conservation movement, either as researchers or practitioners. It has been demonstrated that early career conservation scientists hold a wide range of values (Sandbrook et al., 2010), that a significant proportion of conservationists hold values in favour of treating animals with concern for their welfare and the intrinsic worth of their lives (Bruskotter et al., 2019; Lute et al., 2018; Vucetich et al., 2021), that the views of conservationists from around the world are diverse but not divided into clearly distinct positions (Sandbrook et al., 2019), and that the way stakeholders interpret scientific research on the conservation value of captive-bred lions is shaped by their underlying values (Hiller & MacMillan, 2021). At the theoretical level, essays have discussed whether conservation goals should be based on science or socio-political values (Noss et al., 2012), as well as the risks of conflating the two (Wilhere et al., 2012); a debate that dates back at least two decades (Noss, 1996). Questions of value in conservation (and, more broadly, environmentalism) have also had practical implications for policy and practice at least since nineteenth-century debates about the proper values of nature (Clayton, 2019). More recently, work on 'relational values' (Chan et al., 2018) and the multiple values of nature have shaped the framework of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (Díaz et al., 2018; Pascual et al., 2017).

Values are not isolated psychological phenomena. People's values may be shaped by various factors, including prevailing ecological conditions, social institutions and local communities (Hechter, 1993). In turn, values may shape a range of processes and phenomena, including individuals' behaviours (Schultz et al., 2005). In this vein, a handful of studies have identified several factors associated with the values of conservationists, such as their gender, educational specialism, age, level of seniority and nationality (Sandbrook et al., 2019). There are differences in the values of conservation researchers who self-define as social scientists, natural scientists or a combination of the two (Montana et al., 2020). Conservationists' values relating to wildlife are linked to their identification with either hunter or animal rights groups (Bruskotter et al., 2019) and to where in the world they work (Lute et al., 2018). Yet while several other factors have been shown to be important in influencing the values of the wider population, such as childhood experiences (Freestone & O'Toole, 2016; Pinder et al., 2020), family background and religion (Hitlin & Piliavin, 2004), there is less work exploring the relationships between such characteristics and conservationists' values (Oh et al., 2021). Values, in turn, shape individuals' choices, such as their career and where they work (Singh et al., 2011), but to date little research has considered how this shapes the conservation movement.

Greater understanding of what predicts conservationists' values would contribute to key conservation debates and initiatives. First, the importance of diversity in the conservation sector has attracted considerable attention in recent years, both as a means to achieve better conservation outcomes and as a desirable goal in

itself (Chaudhury & Colla, 2021; Gould et al., 2018). Knowing what predicts conservationists' values would make it possible to assess the extent to which skews in the representation of other characteristics (e.g. gender, ethnic background and academic background) lead to the over- or under-representation of certain values. This knowledge could be used to inform the composition of teams, panels, groups and organisations so as to enhance the diversity of values therein and provide more representative perspectives. Second, as the relative proportions of shared and divergent values can explain the levels of conflict in conservation, for example over protected areas (Gale & Ednie, 2020), a greater understanding of what predicts values could be used to help design fairer, more effective conflict resolution strategies (Redpath et al., 2013; Young et al., 2016). An improved understanding could also inform the design of educational curricula, by illustrating the kinds of educational content and activities which are likely to expose students to a broad range of values, and by helping to predict the effect that curricular changes are likely to have on students' values. Finally, establishing where and how conservationists' values correlate with other factors would pave the way for further empirical research into which causal relations lead to such correlations; that is, which factors *shape* values and which *are shaped* by them.

This paper aims to improve the understanding of the relationships between conservationists' values and their demographic characteristics and life history. Using data from the largest global survey to date examining the views of conservationists about conservation, we explore statistical associations between respondents' values and their sectoral and research experience, education, the location and context of their work and their experiences as adults and children. We also analyse respondents' free-text responses about other factors that have shaped their values. We discuss the implications of our findings for the management of diversity and disagreement in conservation.

## 2 | METHODS

### 2.1 | Data collection

This study uses quantitative and qualitative data from *The Future of Conservation Survey* ([futureconservation.org](https://futureconservation.org); see Sandbrook et al. (2019) for a full description of the survey; the full survey has also been appended to this paper as [Supporting Information](#)). The final sample consisted of responses from 9264 conservationists from 149 countries (the same responses used by Sandbrook et al., 2019), skewed towards English-speaking, highly educated and Internet-connected respondents.

### 2.2 | Dimensions of conservationists' values

*The Future of Conservation Survey* is based on 38 Likert items derived from the literature around the so-called new conservation

(described in more detail in Sandbrook et al., 2019). These statements can be categorised into a range of different types according to the kind of belief they express (Appendix S1). Some of them are axiological, expressing beliefs about what is good (first definition of 'value' in the Introduction). Many are ought-statements, expressing principles about how conservationists (or conservation as a whole) *should* behave. Some of these ought-statements rest on ethical beliefs (e.g. 'Conservation must benefit poor people because to do so is an ethical imperative'); these statements constitute value-claims in the second sense given in the Introduction. Other ought-statements are underlain by values as conceptions of what is good (first definition) rather than moral principles (second definition); for example, the statement 'Conservation actions should primarily be informed by evidence from biological science' implies that biological science is generally the *best* source of information guiding conservation actions. As articulated in the Introduction, these two understandings of values are related. For instance, the ought-statement 'Conserving nature for nature's sake should be a goal of conservation' constitutes both a moral principle and a belief about what kind of worth nature has (intrinsic value). The upshot is that all ought-statements are underlain by either or both conceptions of values.

Other items are empirical: they express beliefs that can, in principle at least, be proven or disproven through observation. There are items that can be considered both axiological and empirical. For instance, the item 'Giving a voice to those affected by conservation actions improves conservation outcomes' can be read axiologically: the word 'improves' denotes an evaluation of what is a good state of affairs in conservation. But it can also be read empirically: if there were agreement as to what a good conservation outcome is, it would be a further empirical question whether giving a voice to those affected by conservation results in good outcomes. Finally, two statements are metaphysical: they express beliefs about the nature of reality.

Sandbrook et al. (2019) identified three dimensions of variation in conservationists' responses to the Survey. These are *people-centred conservation* (relating to the role that people should play in conservation, as participants, stakeholders and potential beneficiaries; composed of seven items), *science-led ecocentrism* (relating to the right role of science in the conservation of species and ecosystems for their own sakes; composed of seven items), and *conservation through capitalism* (relating to the desirable role of corporations and market-based approaches in conservation; composed of five items). All three dimensions are composed entirely of statements relating to questions of value. Dimensions 1 and 2 are composed overwhelmingly of ought-statements: they capture conservationists' views on how conservation ought to relate to humans (dimension 1), and science, species and ecosystems (dimension 2). Dimension 3 is mostly formed of axiological/empirical statements: it captures conservationists' beliefs about the desirability of partnering with capitalist entities and processes. Respondent scores on these dimensions reflect their level of agreement with each of these three approaches to conservation. These scores are used as the response variables in our analysis.

## 2.3 | Respondents' characteristics

Respondents' characteristics were used as predictor variables and were derived from answers to questions conceived by the authors, guided by the relevant literature and their expert judgement. The 13 characteristics were as follows: educational specialism, level of education, sectors in which respondents had professional experience (which corresponds to *sectoral experience* in figures and text below), level of seniority, country of nationality (aggregated into continents), which countries respondents had worked in (*location of work* in figures and text below; aggregated into continents), the level of modification of the ecosystems in which respondents had mostly worked (*context of work*), experience using market approaches to conservation, the extent to which respondents identified as practitioners or researchers, age, gender, childhood influences and adult influences. To structure the results and discussion and to highlight thematic similarities, we have categorised these characteristics into educational and professional background (entitled *sectoral and research experience*), geographical context (entitled *geographical effects*) and personal experiences in childhood and adulthood (*broader relationships*).

## 2.4 | Data analysis

The steps in our data analysis (and the analysis reported in Sandbrook et al., 2019, which provides the starting point for this work) are summarised in Appendix S2. We examined the associations between respondent's scores on the three dimensions and their characteristics using Bayesian hierarchical linear models (Gelman et al., 2013). The scores were estimated from the multidimensional item response theory model fitted in Sandbrook et al. (2019) using the function *f*scores from the MIRT package (Chalmers, 2012). To capture the uncertainty with which respondents' scores are estimated, the response variable for each model consisted of a single random draw from the posterior distributions of the expected a posteriori respondent scores. These random draws, which are often referred to as 'plausible values' within the psychometrics literature, are suitable for secondary regression analysis because they provide an unbiased estimate of the true distribution (Marsman et al., 2016). We repeated this procedure 10 times for each dimension, each time drawing a new sample from the respondents' scores as the response variable, and averaged the resulting parameter estimates by combining 1000 Markov Chain Monte Carlo samples drawn from their posterior distributions.

Each of the Bayesian hierarchical models used the same structure, including the 13 respondent characteristics captured in *The Future of Conservation Survey* as predictor variables. Each variable was coded as a categorical predictor to avoid prior assumptions about the functional form of the relationships between the predictors and the response. For age, we achieved this by grouping responses into classes (<29, 30–39, 40–49, 50+). Following Gelman (2005, pp. 8–10), we modelled the batches of coefficients corresponding to levels of a single predictor variable as coming from

a distribution centred on zero with a standard deviation estimated from the data. For variables which define mutually exclusive groups at the individual level—that is, those derived from questions where respondents were only allowed to choose a single option—(here: *gender, age, level of education, educational specialism, practitioner or researcher, level of seniority, context of work, market experience and continent of nationality*) this corresponds to a standard hierarchical model with varying intercepts. Variables which defined groupings that were not mutually exclusive—that is, those where respondents were allowed to select all response categories that applied to them—(here: *sectoral experience, childhood influences, adult influences, location of work*) were modelled as multiple membership structures (e.g. Cafri et al., 2015). In both mutually exclusive and non-mutually exclusive cases, the standard deviations of the hierarchical priors were given a Student-t hyperprior with three degrees of freedom, reflecting our belief that smaller standard deviations are most likely but that substantially larger values are also plausible.

The Bayesian hierarchical models were fitted using Stan (Stan Development Team, 2021) via the BRMS package (Bürkner, 2018) in R version 4.0.4 (R Core Team, 2021). Four Markov chains were each run for 2000 iterations, discarding the first 1000 samples as burn-in. Convergence was assessed visually using trace-plots and by reference to the Gelman–Rubin statistic, with values <1.01 for any parameter taken to indicate that the model had satisfactorily converged (Vehtari et al., 2020). Bayesian  $R^2$  was calculated to assess the variance in scores on each dimension that was explained by the predictor variables (Gelman et al., 2019). The relative importance of each variable was assessed by calculating the finite-population standard deviations of the coefficients associated with levels of each grouping variable (Gelman, 2005), excluding levels representing non-specific responses (e.g. 'Not applicable', 'Not reported' or 'Other/Prefer not to say'). When reporting the results of these analyses, we present mean estimates alongside 80% and 95% credible intervals (CIs) as measures of uncertainty and we refer to an estimate as being statistically significant if its associated 95% CI does not overlap zero. To explore the possible interaction effects between continent of nationality and other covariates, we conducted a new supplementary analysis of the data. This new analysis did not substantially improve the explanatory power of the models, which means the effects we report below, based on the original models, were consistent across nationalities (please see Appendix S3 for more details).

At the end of the survey, respondents were asked to write, in open-text format, about anything else they felt had influenced their values as conservationists. A total of 1589 respondents provided answers to this question (1454 after spurious responses were eliminated, e.g. people giving feedback on our survey design instead of answering the question). Qualitative codes were derived by reading through all the responses. The codes resulting from this process were then used to analyse the entire dataset. These results are presented in the section *broader relationships*. Please see Appendix S4 for further details about how qualitative data were analysed.

## 2.5 | Research ethics

This project has been approved by the Research Ethics Committee at the University of Leeds (Ref: LTSEE-054). Before taking the survey, respondents were presented with an informed consent form stating that all data will be stored securely and that no responses will be shared or published except in anonymous form (see [Supporting Information](#)). For more information on the protocols followed during data collection, storage and analysis, please see Sandbrook et al. (2019).

## 3 | RESULTS

### 3.1 | Variable explanatory power and subgroup effect sizes

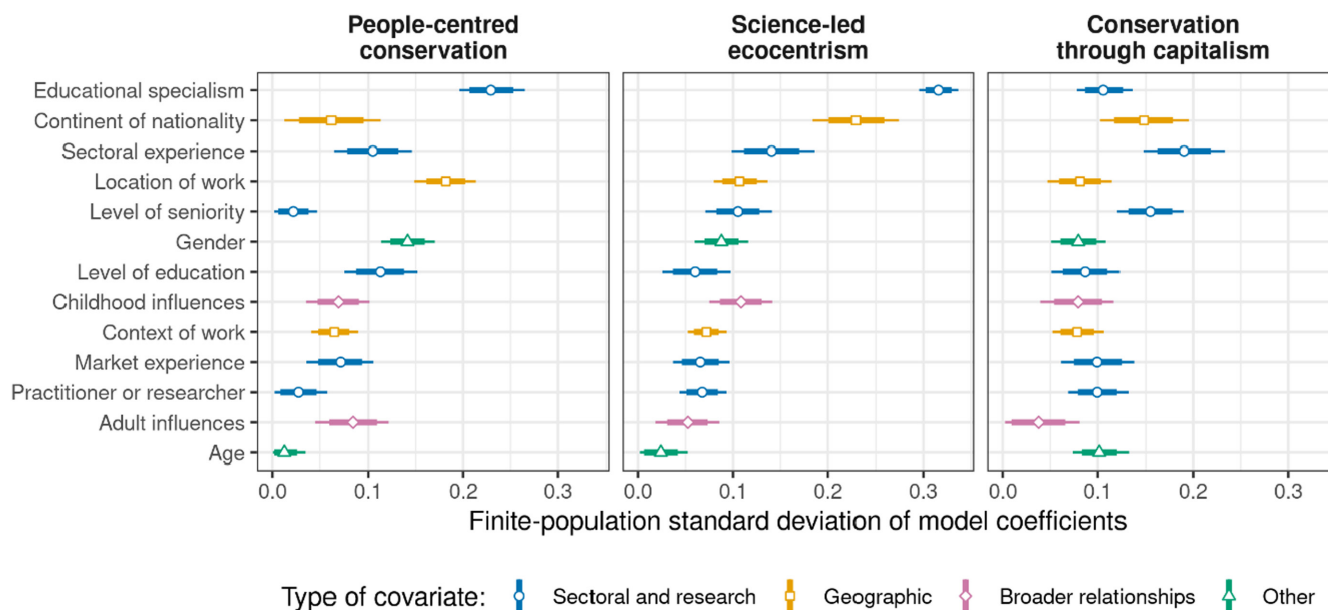
The ranking of variable importance varied substantially between the three dimensions, but *educational specialism* had the highest average explanatory power, as well as being the top predictor of conservationists' values in both *people-centred conservation* and *science-led ecocentrism* (Figure 1). In terms of average explanatory power, *educational specialism* was followed by *continent of nationality*, *sectoral experience* and *location of work*, in that order.

Significant differences in respondents' scores were observed between subgroups across a range of variables (Figure 2; see Appendix S5 for pairwise comparisons). While Figure 2 indicates the direction and effect sizes of differences between each variable subgroup and the mean of the total sample, we recommend that

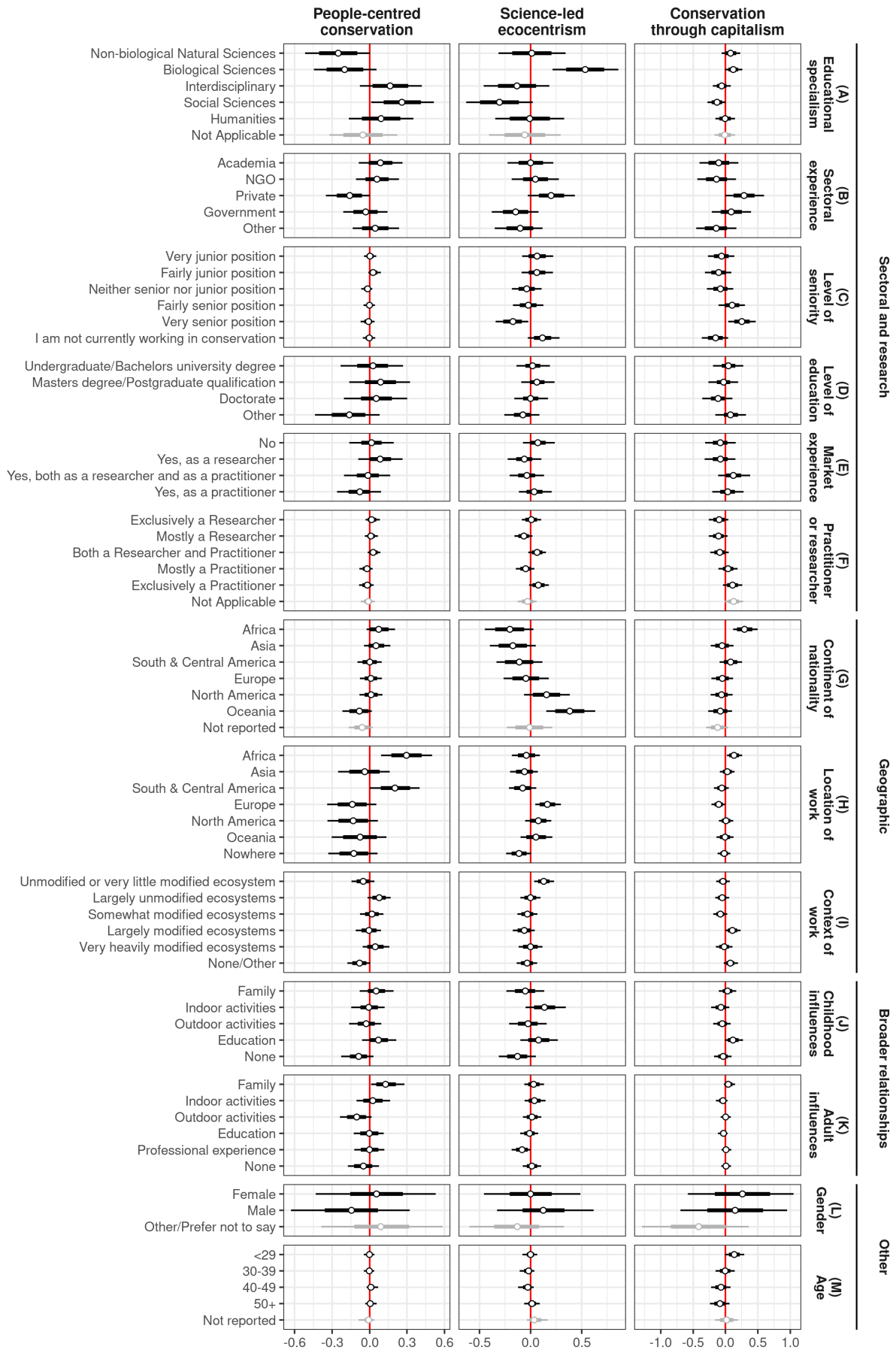
readers consult Appendix S5 when they wish to check the level of significance of direct comparisons between subgroups within each variable. We have assigned a letter to each variable to facilitate comparisons between Figure 2 and Appendix S5. The patterns of effects for the variables of *gender*, *educational specialism*, *age*, *level of seniority* and *continent of nationality* were all consistent with those presented in Sandbrook et al. (2019), which were based on an analysis of the same dataset but using somewhat different models that did not include the same respondent characteristics as the present study. Results for these variables are not further discussed here except in relation to the other variables.

### 3.2 | Sectoral and research experience

Respondents with greater research experience tended to hold less favourable values regarding *conservation through capitalism* than those with less research experience. For instance, the more respondents thought of themselves as researchers (as opposed to practitioners), the less in favour they were of *conservation through capitalism*, a trend which was mirrored in the variable *level of education* (Figure 2d,f; Appendix S5). Moreover, respondents who had professional experience as researchers using market approaches to conservation (such as payment for ecosystem services schemes) scored significantly less positively on the dimensions *conservation through capitalism* and *science-led ecocentrism*, but more positively for *people-centred conservation*, than those who had experience of them as practitioners (Figure 2e; Appendix S5). The opposite combination of values (less in favour of *people-centred conservation*, more in



**FIGURE 1** The relative explanatory power of each variable with respect to variation in conservationists' scores on each of the three dimensions. The variables are ranked according to the average of their standard deviations across the three dimensions, from largest (top) to smallest (bottom). Points represent the mean estimate, thick lines the 80% credible interval (CI) and thin lines the 95% CI. The Bayesian  $R^2$  values for the fitted models are 0.09 (CI95: 0.08, 0.10) for people-centred conservation, 0.17 (CI95: 0.15–0.18) for science-led ecocentrism and 0.08 (CI95: 0.07–0.09) for conservation through capitalism.



**FIGURE 2** The differences between the mean score for the overall sample on each dimension (red line) and the scores of respondents from each of the variable subgroups, with rightwards indicating scores more in favour with the dimension and leftwards indicating less in favour. Points represent the mean estimate, thick lines the 80% credible interval (CI) and thin lines the 95% CI. Scores presented in light grey represent non-specific response categories (e.g. 'not reported'). The levels of significance of pairwise comparisons between variable subgroups are reported in Appendix S5.

favour of *science-led ecocentrism* and more in favour of *conservation through capitalism*) was observed in respondents who indicated that they had professional experience in the private sector, as compared with other subgroups within the variable *sectoral experience*.

### 3.3 | Geographical effects

Where respondents had carried out conservation work, aggregated into continents, was significantly associated with differences in their values (*location of work* in Figure 2h; Appendix S5). Respondents who reported having done conservation work in African or Central & South American countries expressed more *people-centred* values than those who had worked in other continents; those who reported having worked in European and/or North American countries had values more aligned with *science-led ecocentrism* than those who had worked in African, Asian or South and Central American countries; and those who said they had worked in African and European countries were, respectively, more and less in favour of *conservation through capitalism* as compared to other subgroups.

Respondents' perception of the level of modification of the ecosystems in which they had worked (*context of work* in Figure 2i) was also significantly associated with differences in their values (Figure 2i; Appendix S5). Those who reported that they had mostly worked in unmodified or very little modified ecosystems were significantly less in favour of *people-centred* approaches than those in all other categories except *largely modified ecosystems*, and more in favour of *science-led ecocentrism*. Those who reported to have worked in largely modified ecosystems were significantly more in favour of *conservation through capitalism* than those in all other categories.

### 3.4 | Broader relationships

We found strong relationships between respondents' beliefs about how their life experiences had influenced their values and their scores on each of the three dimensions (Figure 2j,k; Appendix S5). Respondents who thought that adult experiences of outdoor and indoor activities and education had shaped their values did not differ significantly from one another in their views on *conservation through capitalism*. In contrast, those who thought that family influences during childhood had shaped their values were significantly more in favour of *conservation through capitalism* than those who thought that outdoor and indoor activities during childhood had shaped their values. Similarly, there were no significant differences in the scores on *science-led ecocentrism* between conservationists who thought that outdoor and indoor activities, education and family influences during

adulthood had shaped their values; interestingly, though, some of the differences in these scores were significant when considering conservationists who thought these factors had shaped their values during childhood. Respondents who thought that outdoor activities had shaped their values were less in favour of *people-centred conservation* than those who thought that education and their families had shaped their values, and these differences were significant when the perceived influence had happened in either childhood or adulthood.

There was wide variation in the nature of responses to the open-text question asking whether respondents thought that anything else had been important in shaping their values (Figure 3; Appendix S4). Travel and religion were the two most frequently cited categories. Some respondents gave highly subjective and experiential accounts of what had shaped their values, for instance:

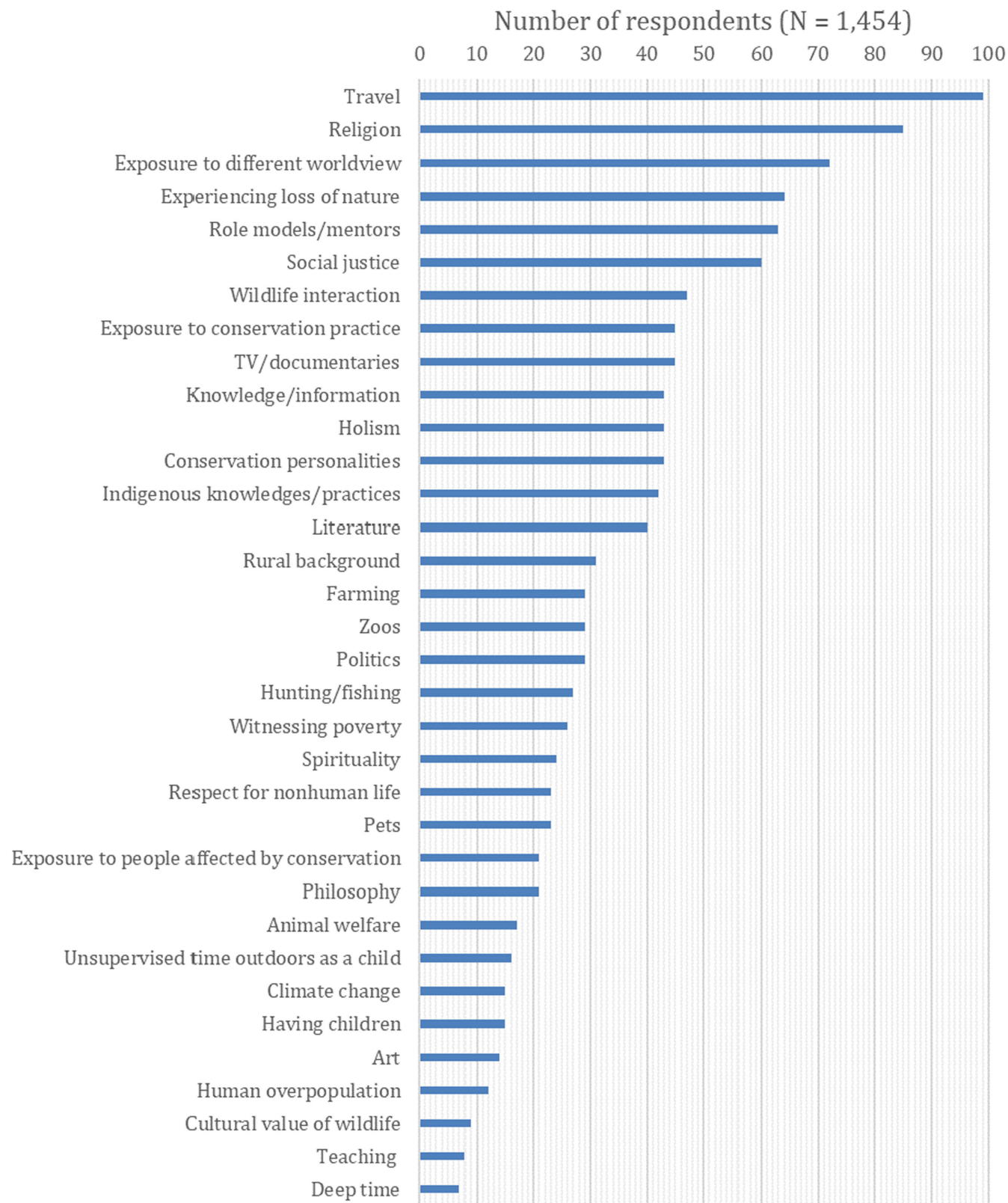
Extended periods of living with very poor people who survive largely by subsistence farming and fishing in the Pacific and especially Melanesia—this experience has been profoundly revelatory for me. I believe that the process of humanising poor people who live close to nature [would change the minds of many] conservationists.

Another respondent gave a moving first-person account of seeking refuge in nature during a time of intense emotional affliction. This encounter eased the respondent's personal hardship and instigated a commitment to protect those landscapes.

Strong emotions were also expressed within the theme *experiencing loss of nature*. For instance, one respondent wrote: 'My interest in conservation stemmed from a passion for nature and then seeing how nature was being lost locally and globally and at a terrifying rate'. A total of 73 respondents used the word 'love' in answering the question of what else had shaped their values (Table A4). Other commonly used words denoting emotions were 'passion' (33), 'empathy' (12) and 'fascination' (9). Less common but still remarkable were 'wonder' (7), 'awe' (2) and 'enchantment' (1). A total of 188 respondents (12.9% of those making an open-text response) used emotion-laden language their responses (Appendix S4).

## 4 | DISCUSSION

This is the first global study to explore the associations between a broad range of conservationists' personal and professional characteristics and their values. Our results provide novel insights into which factors are most closely associated with differences in conservationists' values.



**FIGURE 3** Qualitative codes extracted from open-text answers to the last question in the survey, 'please feel free to tell us about anything else that you think was important in shaping your values'. Scores indicate the total number of respondents who mentioned each theme (where appropriate, multiple codes were applied to individual responses [e.g. where a single respondent mentioned both travel and religion] so that the total sum of scores for all codes exceeds the total number of respondents). See Appendix S4 for further details on how the codes were extracted, the meaning of each code and examples of responses for each code.



#### 4.1 | Educational and sectoral experience

The fact that *educational specialism* was the top overall predictor, as well as the top predictor for *people-centred conservation* and *science-led ecocentrism*, suggests strong and enduring linkages between training and values for those working in conservation. This could be because educational experiences shape values, or alternatively, because students choose what to study based on values they already hold. Both explanations could be true and may act synergistically. Further empirical work would be needed to confirm the direction of causal relationships.

Regardless of the direction of causality, the significance of *educational specialism* is relevant to current discussions about the role of interdisciplinarity in conservation research (Pooley et al., 2014), as it shows that collaborative research across different disciplines is likely to bring more than just diversity of methodological approaches and ways of knowing the world—it is likely to bring different values to bear. This could be seen as a strength of interdisciplinarity, if value plurality broadens the range of viewpoints and strengthens the applicability of research to the diversity of challenges in the world in and beyond conservation research and practice (Robinson, 2011). Alternatively, diversity of values could become a barrier to collaboration when different values are incompatible or incommensurable, which would question the feasibility and desirability of calls for inclusive conservation (Tallis & Lubchenco, 2014). Despite repeated calls for greater interdisciplinarity, conservation degrees remain dominated by natural science content (Gardner, 2021). Our results also suggest that if the range of disciplinary perspectives included in curricula were broadened, students would be exposed to a wider diversity of values, which would enable them to critically reflect on their own knowledge, values and assumptions (Gardner, 2021). This suggestion is supported by the fact that 72 respondents claimed that being exposed to other people's worldviews had influenced their values (Figure 3).

Our results also add to discussions about existing divisions between conservation researchers and practitioners. The fact that practitioners were generally more in favour of capitalist approaches to conservation than researchers may reflect a pragmatic stance, in this case relating to their need to work within existing economic structures, in contrast to researchers who may be freer to imagine alternatives. It may also reflect the fact that the extensive academic literature critiquing capitalist approaches to conservation (e.g. Büscher & Fletcher, 2020) has had seemingly little influence on practice. Practical hurdles such as the limited dissemination of research outputs (often in jargon-filled language that is unclear to policymakers and practitioners), practitioners lacking the time to read scientific studies, and journal paywalls acting as information barriers between academia and conservation policy and practice (Jarvis et al., 2020; Walsh et al., 2019) have all been offered as explanations for the lack of impact on conservation practices of academic publications. The findings reported here suggest an additional explanation for this limited influence of academic research: that the values of conservation researchers

often do not align with those of practitioners. This may limit the extent to which practitioners agree with recommendations issued by researchers, as well as contribute to a view among practitioners that researchers are not doing the kind of research they need. In these cases, collaborative approaches and discussions that aim to identify and negotiate differing values may be an effective way of bridging the gaps between research and practice (Montana et al., 2020).

#### 4.2 | Geographical effects and ethnic representation

The fact that *continent of nationality* was the second strongest predictor of conservationists' values adds to ongoing discussions around the need for diversity in the conservation sector, particularly in moving beyond the domination of a small and privileged subset of Western conservationists and worldviews (e.g. Adams & Mulligan, 2003; Rudd et al., 2021). Some respondents expressed this opinion in the open-text responses, including one who said simply that 'race and ethnicity' had been important in shaping their values. Others called attention to the Western view of conservation implicit in the design of *The Future of Conservation Survey*, which reflects its intention to understand views on issues raised by the 'new conservation' debate, itself largely conducted by conservationists from the Global North (Holmes et al., 2017). One respondent wrote, 'As an Indian American I was also raised in a culture that treats animal life as worthy of moral consideration. The fact that this is completely left out of this survey to me reflects a major oversight in Western conservation'.

The link between ethnicity and/or cultural background and values was also demonstrated in a recent survey of African social media on trophy hunting, which revealed issues of neo-colonialism, power and race that had largely been excluded from Western debates about this kind of hunting (Mkono, 2019). Our results on the relations between conservationists' geographies and their values suggest that place- and community-based conservation projects are more likely to embody local people's values than top-down, transnational interventions. However, it is crucial to note that, by focusing on respondents' country of origin, and aggregating these into continents, our results will have missed any variation in values between and within the countries of each continent (Bauer et al., 2021). The findings presented here should contribute to debates about diversity of people and of values in conservation at a global level (Chaudhury & Colla, 2021; Haelewaters et al., 2021). But they must be complemented by more regionally specific studies, for instance to cast light on the potential differences in values, within countries in the Global South, between elite, internationally connected conservationists and local groups (e.g. Akchurin, 2015).

Our results indicate that the values of respondents who reported working in unmodified or very little modified ecosystems differed from those in other subgroups, especially through their positive association with *science-led ecocentrism*. There are

three ways in which this result can be understood. First, through theories on the place-based nature of environmental values (Chapman, 2002; Norton & Hannon, 1997; O'Neill et al., 2008), which posit that values are not always placeless abstractions; rather, they emerge from the various relationships that exist between particular places and the people who live, work, visit or otherwise experience them. As such, it is by living and working in these places that certain values arise. One respondent said that their values had been influenced by 'The place where I grew up [...] Strong place values have influenced me in various ways: who I am today, the causes I work for and what I care about.' Viewed in these terms, our results suggest that conservationists who work in relatively more pristine landscapes come to value nature in distinctly ecocentric terms, with these values emerging from and being bound to places in which human impacts are relatively trivial.

Second, this result could be understood by considering that, in addition to values being constructed from places, places—as subjectively experienced by particular persons—are, in turn, partly constructed from values. Hence, two people visiting the same location, each with distinct personal and cultural backgrounds, may in fact experience two very different places (Cresswell, 2004). Interpreted this way, conservationists who already hold ecocentric values come to perceive the ecosystems they work in as unmodified or very little modified, thus reversing the causality of the previous interpretation. This interpretation also helps explain the somewhat surprising fact that 37% of our respondents claimed to be working in unmodified or very little modified ecosystems, particularly given that—through climate change especially—humans have altered every ecosystem on Earth (Ellis et al., 2021). A third possible explanation is that conservationists who already hold ecocentric values are drawn to work in landscapes that are largely intact. As with other results in which causality is unspecified, it is likely that all three explanations hold true in various contexts and for different conservationists, and may also work synergistically.

### 4.3 | Broader relationships

The fact that respondents who selected *indoor activity* during childhood and/or adulthood as something that had shaped their values were more in favour of *science-led ecocentrism* poses the question of what those activities may be. The open-text responses offer clues in that regard: 40 respondents specified that literature had influenced their values (Figure 3), a result consistent with Freestone and O'Toole's (2016) findings on the impact of reading fiction on pro-environmental values. Moreover, 45 respondents claimed that watching TV (mostly in the form of nature documentaries) had shaped their values, and 18 respondents mentioned David Attenborough by name (Figure 3; Table A4). Nature documentaries often present nature as separate from humans (Huggan, 2013; Jones et al., 2019; Sandbrook & Adams, 2013), which may suggest that they have an influence in favour of ecocentric values.

The fact that 16 respondents claimed that unsupervised, unstructured or free play in nature during childhood had influenced their values is interesting in the context of recent calls to reverse 'nature deficit disorder' in children (Balmford et al., 2002; Louv, 2005), a hypothesised condition whereby a lack of exposure to nature has extensive physical and mental health implications. It is consistent with findings of a study which observed that the single most important factor behind environmental action in adults was an emotionally powerful experience of nature as a child (Chawla, 1999). Recent research in Australia has also found that undergraduates' behaviours related to conservation were positively associated with pro-nature family values, environmental volunteering and reading of nature-related books during childhood (Pinder et al., 2020).

The number of respondents who mentioned having a rural background (31), farming (29) or hunting and fishing (27) as influential in shaping their values is notable, especially in the context of recent controversies over the relationships and conflicts between farming and conservation (Balmford et al., 2018; Chapman et al., 2019), and indeed over what can legitimately be considered to be conservation and who may be considered a conservationist (Sandbrook, 2015). It also reflects the fact that for many people and in many cultures, having healthy and moral relationships with nonhuman beings does not preclude, and even necessitates, using them for food, shelter and other purposes (Lestel, 2016).

Consistent with the findings of a large-scale and in-depth study of North American environmental values (Kempton et al., 1995), respondents' written answers suggest that in many cases their values about conservation were interrelated with broader values, as opposed to being a distinct set of values exclusively pertaining to the natural world. A total of 102 respondents indicated that their values relating to conservation had been influenced by religion or spirituality, or both. Other codes that reveal the entwined nature of values to do with conservation and broader values include *concern for social justice* and *politics*. One respondent explicitly said that their values concerning conservation had been shaped by 'Broad values (i.e. not based around conservation or the natural world) from my family during childhood'. From a theoretical standpoint, the observed lack of a clear demarcation between values pertaining to conservation and broader values is unsurprising, because nature and the environment as concepts are notoriously hard to delineate. As Raymond Williams (1976, pp. 219, 223) memorably put it, 'Nature is perhaps the most complex word in the [English] language' (see also Ducarme et al., 2021). If nature and the environment are messy and blurry concepts, it is hard to see how there could be a distinct set of values that exclusively applied to them. This is why throughout this paper, we have spoken of conservationists' values rather than conservation values.

Only 43 respondents wrote that knowledge, understanding and information had shaped their values, compared with 188 who used emotion-laden language in their responses. This may suggest that conservationists are better able to recall emotional influences than cognitive ones. Alternatively, it could suggest that emotions are more salient value-shapers among conservationists than cognitive

or intellectual analysis, a possibility that is consistent with David Hume's contention that sentiment and feeling, rather than reason, are the foundation of moral values (Hume, 1739, pp. 455–470). It is also worth highlighting that 110 of these 188 respondents were exclusively specialised in the natural sciences, adding an empirical component to the philosophical and anthropological literature on the relationship between scientific knowledge and affect (Fisher, 1998; Milton, 2002), as well as implying that many conservation scientists are driven by emotional attachment to the natural world rather than, or in addition to, the rational pursuit of knowledge. Indeed, values have been previously described as cognitive-affective hybrids (Dewey, 1939; Hitlin & Piliavin, 2004), a view that integrates these two motivational factors. In any case, our results add to other calls for greater emphasis on the emotional component of human–nature relationships, especially given the evidence that moral codes are insufficient to generate action if unaccompanied by the ethical energetics of affects (Bennett, 2001; Coeckelbergh, 2015).

Viewed together, our results constitute the first global picture of relations between conservationists' values and a broad range of factors including their childhood and professional experiences, geography and broader societal values. By charting their interrelations with other factors, we point to other phenomena that must also be researched if conservationists' values are to be more fully understood. The present study also reveals where further research into the causal mechanisms involving values—that is, what specifically *shapes* values and what is *shaped* by values—is likely to yield interesting and useful results. Because conservationists across the globe differ in their characteristics and backgrounds in a multitude of ways, understanding the links between these and their values is a necessary step towards understanding the implications of diversity (and the lack of it) on what is conserved, why, where and how.

#### AUTHORS CONTRIBUTIONS

Chris Sandbrook, Janet A. Fisher and George Holmes conceived the project and designed the survey; Chris Sandbrook, Janet A. Fisher, George Holmes and Rogelio Luque-Lora wrote the text for the survey and distributed it; Aidan Keane analysed the quantitative data; Rogelio Luque-Lora analysed the qualitative data. All authors wrote the manuscript.

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#### CONFLICT OF INTEREST

None.

#### DATA AVAILABILITY STATEMENT

To protect the anonymity of respondents and to comply with the consent form they agreed with before taking the survey (see [Supporting Information](#)), the data used in this study cannot be shared with anyone external to the project.

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#### REFERENCES

- Adams, W. M., & Mulligan, M. (2003). *Decolonizing nature: Strategies for conservation in a post-colonial era*. Earthscan.
- Akchurin, M. (2015). Constructing the rights of nature: Constitutional reform, mobilization, and environmental protection in Ecuador. *Law & Social Inquiry*, 40(4), 937–968. <https://doi.org/10.1111/lsi.12141>
- Balmford, A., Amano, T., Bartlett, H., Chadwick, D., Collins, A., Edwards, D., Field, R., Garnsworthy, P., Green, R., Smith, P., Waters, H., Whitmore, A., Broom, D. M., Chara, J., Finch, T., Garnett, E., Gathorne-Hardy, A., Hernandez-Medrano, J., Herrero, M., ... Eisner, R. (2018). The environmental costs and benefits of high-yield farming. *Nature Sustainability*, 1(9), 477–485. <https://doi.org/10.1038/s41893-018-0138-5>
- Balmford, A., Clegg, L., Coulson, T., & Taylor, J. (2002). Why conservationists should heed Pokémon. *Science*, 295(5564), 2367. <https://doi.org/10.1126/science.295.5564.2367b>
- Bauer, H., Chardonnet, B., Scholte, P., Kamgang, S. A., Tiomoko, D. A., Tehou, A. C., Sinsin, B., Gebresenbet, F., Asefa, A., Bobo, K. S., Garba, H., Abagana, A. L., Diouck, D., Mohammed, A. A., & Sillero-Zubiri, C. (2021). Consider divergent regional perspectives to enhance wildlife conservation across Africa. *Nature Ecology & Evolution*, 5(2), 149–152. <https://doi.org/10.1038/s41559-020-01343-6>
- Bennett, J. (2001). *The enchantment of modern life: Attachments, crossings, and ethics*. Princeton University Press.
- Bruskotter, J. T., Vucetich, J. A., Dietsch, A., Slagle, K. M., Brooks, J. S., & Nelson, M. P. (2019). Conservationists' moral obligations toward wildlife: Values and identity promote conservation conflict. *Biological Conservation*, 240(December), 108296. <https://doi.org/10.1016/j.biocon.2019.108296>
- Bürkner, P.-C. (2018). Advanced Bayesian multilevel modeling with the R package brms. *The R Journal*, 10(1), 395–411.
- Büscher, B., & Fletcher, R. (2020). *The conservation revolution: Radical ideas for saving nature beyond the Anthropocene*. Verso.
- Cafri, G., Hedeker, D., & Aarons, G. A. (2015). An Introduction and integration of cross-classified, multiple membership, and dynamic group random-effects models. *Psychological Methods*, 20(4), 407–421. <https://doi.org/10.1037/met0000043>
- Cahen, H. (1988). Against the moral considerability of ecosystems. *Environmental Ethics*, 10(2), 195–216.
- Callicott, J. B. (1984). Non-anthropocentric value theory and environmental ethics. *American Philosophical Quarterly*, 21(4), 299–309.
- Chalmers, R. P. (2012). Mirt: A multidimensional item response theory package for the R environment. *Journal of Statistical Software*, 48(1), 1–29. <https://doi.org/10.18637/jss.v048.i06>
- Chan, K. M. A., Gould, R. K., & Pascual, U. (2018). Editorial overview: Relational values: What are they, and what's the fuss about? *Current Opinion in Environmental Sustainability*, 35(December), A1–A7. <https://doi.org/10.1016/j.cosust.2018.11.003>
- Chapman, M., Satterfield, T., & Chan, K. M. A. (2019). When value conflicts are barriers: Can relational values help explain farmer

- participation in conservation incentive programs? *Land Use Policy*, 82(March), 464–475. <https://doi.org/10.1016/j.landusepol.2018.11.017>
- Chapman, R. L. (2002). The goat-stag and the sphinx: The place of the virtues in environmental ethics. *Environmental Values*, 11(2), 129–144. <https://doi.org/10.3197/096327102129341019>
- Chaudhury, A., & Colla, S. (2021). Next steps in dismantling discrimination: Lessons from ecology and conservation science. *Conservation Letters*, 14, e12774. <https://doi.org/10.1111/conl.12774>
- Chawla, L. (1999). Life paths into effective environmental action. *The Journal of Environmental Education*, 31(1), 15–26. <https://doi.org/10.1080/00958969909598628>
- Clayton, J. (2019). *Natural rivals: John Muir, Gifford Pinchot, and the creation of America's public lands*. Pegasus Books.
- Coeckelbergh, M. (2015). *Environmental skill: Motivation, knowledge, and the possibility of a non-romantic environmental ethics*. Routledge.
- Cresswell, T. (2004). *Place: A short Introduction*. Blackwell Pub.
- Dewey, J. (1939/1991). Theory of valuation. In J. A. Boydston (Ed.), *John Dewey: The later works 1925–1953* (Vol. 13, pp. 189–251). Southern Illinois University Press.
- Díaz, S., Pascual, U., Stenseke, M., Martín-López, B., Watson, R. T., Molnár, Z., Hill, R., Chan, K. M. A., Baste, I. A., Brauman, K. A., Polasky, S., Church, A., Lonsdale, M., Larigauderie, A., Leadley, P. W., van Oudenhoven, A. P. E., van der Plaats, F., Schröter, M., Lavorel, S., ... Shirayama, Y. (2018). Assessing nature's contributions to people. *Science*, 359(6373), 270–272. <https://doi.org/10.1126/science.aap8826>
- Dietsch, A. M., Teel, T. L., & Manfredi, M. J. (2016). Social values and biodiversity conservation in a dynamic world. *Conservation Biology*, 30(6), 1212–1221. <https://doi.org/10.1111/cobi.12742>
- Dietz, T., Fitzgerald, A., & Shwom, R. (2005). Environmental values. *Annual Review of Environment and Resources*, 30(1), 335–372. <https://doi.org/10.1146/annurev.energy.30.050504.144444>
- Ducarme, F., Flipo, F., & Couvet, D. (2021). How the diversity of human concepts of nature affects conservation of biodiversity. *Conservation Biology*, 35(3), 1019–1028. <https://doi.org/10.1111/cobi.13639>
- Ellis, E. C., Gauthier, N., Goldewijk, K. K., Bird, R. B., Boivin, N., Díaz, S., Fuller, D. Q., Gill, J. L., Kaplan, J. O., Kingston, N., Locke, H., McMichael, C. N. H., Ranco, D., Rick, T. C., Shaw, M. R., Stephens, L., Svenning, J.-C., & Watson, J. E. M. (2021). People have shaped most of terrestrial nature for at least 12,000 years. *Proceedings of the National Academy of Sciences of the United States of America*, 118(17), 8. <https://doi.org/10.1073/pnas.2023483118>
- Fisher, P. (1998). *Wonder, the rainbow, and the aesthetics of rare experiences*. Harvard University Press.
- Freestone, M., & O'Toole, J. M. (2016). The impact of childhood reading on the development of environmental values. *Environmental Education Research*, 22(4), 504–517. <https://doi.org/10.1080/13504622.2014.989962>
- Gale, T., & Ednie, A. (2020). Can intrinsic, instrumental, and relational value assignments inform more integrative methods of protected area conflict resolution? Exploratory findings from Aysén, Chile. *Journal of Tourism and Cultural Change*, 18(6), 690–710. <https://doi.org/10.1080/14766825.2019.1633336>
- Gardner, C. J. (2021). Not teaching what we practice: Undergraduate conservation training at UK universities lacks interdisciplinarity. *Environmental Conservation*, 48(1), 65–70. <https://doi.org/10.1017/S0376892920000442>
- Gelman, A. (2005). Analysis of variance: Why it is more important than ever. *The Annals of Statistics*, 33(1), 1–31.
- Gelman, A., Carlin, J., Stern, H., Dunson, D., Vehtari, A., & Rubin, D. (2013). *Bayesian data analysis* (3rd ed.). Chapman & Hall/CRC Texts in Statistical Science. Taylor & Francis.
- Gelman, A., Goodrich, B., Gabry, J., & Vehtari, A. (2019). R-squared for Bayesian regression models. *The American Statistician*, 73(3), 307–309. <https://doi.org/10.1080/00031305.2018.1549100>
- Gould, R. K., Phukan, I., Mendoza, M. E., Ardoin, N. M., & Panikkar, B. (2018). Seizing opportunities to diversify conservation. *Conservation Letters*, 11, e12431. <https://doi.org/10.1111/conl.12431>
- Haelewaters, D., Hofmann, T. A., & Romero-Olivares, A. L. (2021). Ten simple rules for global north researchers to stop perpetuating helicopter research in the global south. *PLoS Computational Biology*, 17(8), e1009277. <https://doi.org/10.1371/journal.pcbi.1009277>
- Hechter, M. (1993). Values research in the social and behavioral sciences. In R. Michod, L. Nadel, & M. Hechter (Eds.), *The origin of values* (pp. 1–25). Aldine Transaction.
- Hicks, C. C., Cinner, J. E., Stoeckl, N., & McClanahan, T. R. (2015). Linking ecosystem services and human-values theory. *Conservation Biology*, 29(5), 1471–1480. <https://doi.org/10.1111/cobi.12550>
- Hiller, C., & MacMillan, D. C. (2021). How worldview and personal values can shape conservation conflict—The case of captive-bred lions. *Biological Conservation*, 258(June), 109151. <https://doi.org/10.1016/j.biocon.2021.109151>
- Hitlin, S., & Piliavin, J. A. (2004). Values: Reviving a dormant concept. *Annual Review of Sociology*, 30(1), 359–393. <https://doi.org/10.1146/annurev.soc.30.012703.110640>
- Holmes, G., Sandbrook, C., & Fisher, J. A. (2017). Understanding conservationists' perspectives on the new-conservation debate. *Conservation Biology*, 31(2), 353–363. <https://doi.org/10.1111/cobi.12811>
- Huggan, G. (2013). *Nature's Saviours: Celebrity conservationists in the television age*. Routledge.
- Hume, D. (1739). *A treatise of human nature: Being an attempt to introduce the experimental method of reasoning into moral subjects* (1st ed.). Clarendon Press. [http://files.libertyfund.org/files/342/0213\\_Bk.pdf](http://files.libertyfund.org/files/342/0213_Bk.pdf)
- James, S. P. (2016). The trouble with environmental values. *Environmental Values*, 25(2), 131–144. <https://doi.org/10.3197/096327116X14552114338747>
- Jarvis, R. M., Borrelle, S. B., Forsdick, N. J., Pérez-Hammerle, K.-V., Dubois, N. S., Griffin, S. R., Recalde-Salas, A., Buschke, F., Rose, D. C., Archibald, C. L., Gallo, J. A., Mair, L., Kadykalo, A. N., Shanahan, D., & Prohaska, B. K. (2020). Navigating spaces between conservation research and practice: Are we making progress? *Ecological Solutions and Evidence*, 1, e12028. <https://doi.org/10.1002/2688-8319.12028>
- Jones, J. P. G., Thomas-Walters, L., Rust, N. A., & Veríssimo, D. (2019). Nature documentaries and saving nature: Reflections on the new Netflix series *Our Planet*. *People and Nature*, 1(4), 420–425. <https://doi.org/10.1002/pan3.10052>
- Kempton, W. M., Boster, J. S., & Hartley, J. A. (1995). *Environmental values in American culture*. MIT Press.
- Lestel, D. (2016). *Eat this book: A carnivore's manifesto*. Translated by Gary Steiner. Columbia University Press.
- Louv, R. (2005). *Last child in the woods: Saving our children from nature-deficit disorder*. Algonquin Books.
- Lute, M. L., Carter, N. H., López-Bao, J. V., & Linnell, J. D. C. (2018). Conservation professionals agree on challenges to coexisting with large carnivores but not on solutions. *Biological Conservation*, 218(February), 223–232. <https://doi.org/10.1016/j.biocon.2017.12.035>
- Manfredo, M. J., Bruskotter, J. T., Teel, T. L., Fulton, D., Schwartz, S. H., Arlinghaus, R., Oishi, S., Uskul, A. K., Redford, K., Kitayama, S., & Sullivan, L. (2017). Why social values cannot be changed for the sake of conservation. *Conservation Biology*, 31(4), 772–780. <https://doi.org/10.1111/cobi.12855>
- Manfredo, M. J., Teel, T. L., Berl, R. E. W., Bruskotter, J. T., & Kitayama, S. (2021). Social value shift in favour of biodiversity conservation in the United States. *Nature Sustainability*, 4, 323–330. <https://doi.org/10.1038/s41893-020-00655-6>
- Marsman, M., Maris, G., Bechger, T., & Glas, C. (2016). What can we learn from plausible values? *Psychometrika*, 81(2), 274–289. <https://doi.org/10.1007/s11336-016-9497-x>

- Milton, K. (2002). *Loving nature: Towards and ecology of emotion*. Routledge.
- Mkono, M. (2019). Neo-colonialism and greed: Africans' views on trophy hunting in social media. *Journal of Sustainable Tourism*, 27(5), 689–704. <https://doi.org/10.1080/09669582.2019.1604719>
- Montana, J., Sandbrook, C., Robertson, E., & Ryan, M. (2020). Revealing research preferences in conservation science. *Oryx*, 1–8, 404–411. <https://doi.org/10.1017/S003060531900067X>
- Norton, B. G., & Hannon, B. (1997). Environmental values: A place-based theory. *Environmental Ethics*, 227–245, 19–245.
- Noss, R. F. (1996). Conservation biology, values, and advocacy. *Conservation Biology*, 10(3), 904.
- Noss, R. F. (2007). Values Are a Good Thing in Conservation Biology. *Conservation Biology*, 21(1), 18–20. <https://doi.org/10.1111/j.1523-1739.2006.00637.x>
- Noss, R. F., Dobson, A. P., Baldwin, R., Beier, P., Davis, C. R., Dellasala, D. A., Francis, J., Locke, H., Nowak, K., Lopez, R., Reining, C., Trombulak, S. C., & Tabor, G. (2012). Bolder thinking for conservation. *Conservation Biology*, 26(1), 1–4. <https://doi.org/10.1111/j.1523-1739.2011.01738.x>
- Oh, R. R. Y., Fielding, K. S., Nghiem, L. T. P., Chang, C. C., Carrasco, L. R., & Fuller, R. A. (2021). Connection to nature is predicted by family values, social norms and personal experiences of nature. *Global Ecology and Conservation*, 28(August), e01632. <https://doi.org/10.1016/j.gecco.2021.e01632>
- O'Neill, J., Holland, A., & Light, A. (2008). *Environmental Values*. Routledge.
- Pascual, U., Balvanera, P., Díaz, S., Pataki, G., Roth, E., Stenseke, M., Watson, R. T., Başak Dessane, E., Islar, M., Kelemen, E., Maris, V., Quaas, M., Subramanian, S. M., Wittmer, H., Adlan, A., Ahn, S. E., al-Hafedh, Y. S., Amankwah, E., Asah, S. T., ... Yagi, N. (2017). Valuing nature's contributions to people: The IPBES approach. *Current Opinion in Environmental Sustainability*, 26–27(June), 7–16. <https://doi.org/10.1016/j.cosust.2016.12.006>
- Pinder, J., Fielding, K. S., & Fuller, R. A. (2020). Conservation concern among Australian undergraduates is associated with childhood socio-cultural experiences. *People and Nature*, 2(4), 1158–1171. <https://doi.org/10.1002/pan3.10145>
- Pooley, S. P., Andrew Mendelsohn, J., & Milner-Gulland, E. J. (2014). Hunting down the chimera of multiple disciplinary in conservation science. *Conservation Biology*, 28(1), 22–32. <https://doi.org/10.1111/cobi.12183>
- R Core Team. (2021). R: A language and environment for statistical computing (version 4.0.4). R Foundation for Statistical Computing. <https://www.R-project.org/>
- Redpath, S. M., Young, J., Evely, A., Adams, W. M., Sutherland, W. J., Whitehouse, A., Amar, A., Lambert, R. A., Linnell, J. D. C., Watt, A., & Gutiérrez, R. J. (2013). Understanding and managing conservation conflicts. *Trends in Ecology & Evolution*, 28(2), 100–109. <https://doi.org/10.1016/j.tree.2012.08.021>
- Robinson, J. G. (2011). Ethical pluralism, pragmatism, and sustainability in conservation practice. *Biological Conservation*, 144(3), 958–965. <https://doi.org/10.1016/j.biocon.2010.04.017>
- Rudd, L. F., Allred, S., Bright, J. G., Ross, D. H., Nkomo, M. N., Shanker, K., Allen, T., Biggs, D., Dickman, A., Dunaway, M., Ghosh, R., González, N. T., Kepe, T., Mbizah, M. M., Middleton, S. L., Oommen, M. A., Paudel, K., Sillero-Zubiri, C., & Dávalos, A. (2021). Overcoming racism in the twin spheres of conservation science and practice. *Proceedings of the Royal Society B: Biological Sciences*, 288(1962), 20211871. <https://doi.org/10.1098/rspb.2021.1871>
- Sandbrook, C., & Adams, W. M. (2013). *The BBC's Africa as Middle Earth*. Thinking like a human (blog). 2013. <https://thinkinglikeahuman.com/2013/01/18/the-bbcs-africa-as-middle-earth/>
- Sandbrook, C. (2015). What is conservation? *Oryx*, 49(4), 565–566. <https://doi.org/10.1017/S0030605315000952>
- Sandbrook, C., Fisher, J. A., Holmes, G., Luque-Lora, R., & Keane, A. (2019). The global conservation movement is diverse but not divided. *Nature Sustainability*, 2(4), 316–323. <https://doi.org/10.1038/s41893-019-0267-5>
- Sandbrook, C., Scales, I. R., Vira, B., & Adams, W. M. (2010). Value plurality among conservation professionals. *Conservation Biology*, 25, 285–294. <https://doi.org/10.1111/j.1523-1739.2010.01592.x>
- Satterfield, T., & Kalof, L. (2005). *The Earthscan reader in environmental values*. Routledge.
- Schultz, P. W., Gouveia, V. V., Cameron, L. D., Tankha, G., Schmuck, P., & Franěk, M. (2005). Values and their relationship to environmental concern and conservation behavior. *Journal of Cross-Cultural Psychology*, 36(4), 457–475. <https://doi.org/10.1177/0022022105275962>
- Schwartz, S. H. (2006). A theory of cultural value orientations: Explication and applications. *Comparative Sociology*, 5(2–3), 137–182.
- Singh, P., Bhandarker, A., Rai, S., & Jain, A. K. (2011). Relationship between values and workplace: An exploratory analysis. *Facilities*, 29(11/12), 499–520. <https://doi.org/10.1108/02632771111157169>
- Stan Development Team. (2021). *Stan modeling language users guide and reference manual*, 2.26. <https://mc-stan.org>
- Tallis, H., & Lubchenco, J. (2014). A call for inclusive conservation. *Nature*, 155, 27–28.
- Teel, T. L., & Manfredo, M. J. (2010). Understanding the diversity of public interests in wildlife conservation. *Conservation Biology*, 24(1), 128–139. <https://doi.org/10.1111/j.1523-1739.2009.01374.x>
- Teel, T. L., Manfredo, M. J., & Stinchfield, H. M. (2007). The need and theoretical basis for exploring wildlife value orientations cross-culturally. *Human Dimensions of Wildlife*, 12(5), 297–305. <https://doi.org/10.1080/10871200701555857>
- Vehtari, A., Gelman, A., Simpson, D., Carpenter, B., & Bürkner, P.-C. (2020). Rank-normalization, folding, and localization: An improved  $\hat{R}$  for assessing convergence of MCMC. *Bayesian Analysis*, 16(2), 667–718. <https://doi.org/10.1214/20-BA1221>
- Vucetich, J. A., Bruskotter, J. T., van Eeden, L. M., & Macdonald, E. A. (2021). How scholars prioritize the competing values of conservation and sustainability. *Biological Conservation*, 257(May), 109126. <https://doi.org/10.1016/j.biocon.2021.109126>
- Walsh, J. C., Dicks, L. V., Raymond, C. M., & Sutherland, W. J. (2019). A typology of barriers and enablers of scientific evidence use in conservation practice. *Journal of Environmental Management*, 250(November), 109481. <https://doi.org/10.1016/j.jenvman.2019.109481>
- Wilhere, G. F., Maguire, L. A., Michael Scott, J., Rachlow, J. L., Goble, D. D., & Svancara, L. K. (2012). Conflation of values and science: Response to Noss et al. *Conservation Biology*, 26(5), 943–944. <https://doi.org/10.1111/j.1523-1739.2012.01900.x>
- Williams, R. (1976). *Keywords: A vocabulary of culture and society*. Fontana.
- Young, J. C., Searle, K., Butler, A., Simmons, P., Watt, A. D., & Jordan, A. (2016). The role of trust in the resolution of conservation conflicts. *Biological Conservation*, 195(March), 196–202. <https://doi.org/10.1016/j.biocon.2015.12.030>

## SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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