




CONTRIBUTED PAPER

Enhancing disciplinary diversity and inclusion in conservation science and practice based on a case study of the Society for Conservation Biology

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Abstract

Effective conservation requires a variety of perspectives that center on different ways of knowing. Disciplinary diversity and inclusion (DDI) offers an important means of integrating different ways of knowing into pressing conservation challenges. However, DDI means more than multiple disciplinary approaches to conservation; cognitive diversity and epistemic justice are key. In 2020, the Disciplinary Inclusion Task Force was formed via a grassroots movement of the Society for Conservation Biology (SCB) to assess the extent of DDI and to chart a path to increase DDI. First, we assessed past and present SCB governance documents. Next, we surveyed current SCB members ($n = 577$). Finally, we surveyed nonmember conservationists ($n = 213$). Members who were not biological scientists perceived SCB as less diverse (21.4% vs. 16%) and not equitable (21.8% vs. 16%), and, although the majority (44) of nonmembers reported that their work aligned reasonably well with the mission of the SCB, they thought the organization focused on biological sciences. Despite SCB's mission to be diverse and inclusive, realizing this mission will likely require diverse epistemological perspectives and shifting from top-down models of knowledge transfer. In centering on DDI, SCB can achieve its aspirations of connecting members across disciplines and ways of knowing to foster diverse perspectives and practices. We recommend that SCB and other organizations develop mechanisms to increase recruitment

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and retention of diverse members and leadership as well as expand strategic partnerships to flatten disciplinary hierarchies and promote inclusivity.

KEYWORDS

conservation society, disciplinary, diversity, equity, inclusion, interdisciplinary, professional society, transdisciplinary

INTRODUCTION

Although conservation science originated in the 1980s within the biological sciences, early practitioners recognized “that multidisciplinary approaches will ultimately be the most fruitful” for solving conservation problems (Soulé, 1985, p. 728). Despite these multidisciplinary aspirations, the natural sciences, as developed and practiced in the Global North, have dominated conservation policy and practice (Bennett et al., 2017), whereas the social sciences, humanities, and traditional and Indigenous knowledges, among other ways of knowing, have largely been sidelined (Holmes et al., 2022; Reyes-García & Benyei, 2019). This marginalization of diverse epistemological approaches reduces the effectiveness of global conservation because environmental challenges are both socially and ecologically produced, requiring the integration of holistic insights for effective resolutions (Kamath et al., 2022; Mascia et al., 2003). Transdisciplinarity (integration of diverse research from academic and nonacademic participants in pursuit of a common goal) offers a way forward for the conservation sciences (Pooley et al., 2014). Transdisciplinarity calls for the spanning of, and synthesis across, existing disciplines (von Wehrden et al., 2019). It leaves space for new domains of knowledge to be created through processes of discovery and application and can include alternative or traditionally marginalized ways of knowing. Multidisciplinarity (presence of many disciplines) and interdisciplinarity (intersections or overlap between disciplines) (Klein, 1990; Repko & Szostak, 2020), on the other hand, focus on the existing organization of academic disciplines and their practices, making transdisciplinary substantively different.

The inclusion of other ways of knowing extends beyond integrating insights from different academic disciplines because effective conservation increasingly requires bridging political and social realms (Dick et al., 2016). The prioritization of biological and physical sciences reflects the colonial roots of environmental sciences; ingrained power structures and political processes are designed to reduce the salience of human, nonhuman, and moral consequences in purportedly “value neutral” resource management (Brister, 2016; Serrao-Neumann et al., 2021). Exclusionary power structures that question the rigor and validity of certain types of knowledge remain intact today (Fanelli & Glänzel, 2013). For example, some conservation organizations struggle to integrate qualitative data in decision-making (Claus, 2022). Some scholars have also criticized the imperialism of Western science for its justification of human rights abuses in vulnerable communities (Tsosie, 2012). Knowledge hierarchies hinder conservationists’ capacity to leverage the full potential of diverse disciplinary tools (Toomey et al.,

2017). As a result, organizations in public, private, and civil society sectors are increasingly investing in expanding disciplinary diversity and inclusion (DDI), defined as valuing, validating, and promoting understandings from diverse and distinct bodies of knowledge (Hammarfelt, 2019; Tsosie, 2012; Turner, 2006). For instance, the Intergovernmental Science–Policy Platform on Biodiversity and Ecosystem Services is the first global-scale assessment to systematically engage local and Indigenous knowledges (McElwee et al., 2020). Increasingly, flagship natural science publications, such as *Conservation Biology*, explicitly encourage social science submissions (Fox et al., 2006; Teel et al., 2018). Yet, despite the repeated calls for DDI, the extent of DDI remains largely unassessed in conservation and related professional societies (Bailey et al., 2020; Dayer et al., 2020; Foster et al., 2014).

As the world’s largest professional conservation society, the Society for Conservation Biology (SCB) provides an opportunity to explore how transdisciplinary societies can meaningfully advance DDI. Such professional societies offer important spaces for the development, exchange, and review of research and policy ideas, as well as training and professionalization opportunities for students, scholars, and practitioners. Yet, it remains unclear if and how conservation researchers and professionals currently experience SCB as fostering DDI. In 2020, the Disciplinary Inclusion Task Force was formed via a grassroots movement of by members of the Society for Conservation Biology, with support of the Board of Governors; exploring how DDI is perceived by members and potential members; and identifying opportunities to strengthen DDI in SCB. We conducted 3 independent studies in an assessment of policies and perceptions of SCB’s DDI in governance documents, among SCB members, and among conservation students and professionals who are not SCB members (hereafter nonmembers) (Table 1). Based on our results, we devised recommendations to promote DDI in SCB and the conservation community more widely.

Group positionality statement

Disciplinary diversity is intersectional, and fostering DDI requires redressing other forms of privilege and oppression. The DITF was formed with the aim of providing insight to SCB and other interdisciplinary societies seeking to promote inclusivity (Nyssa et al., 2024, this issue). Our work demanded that we critically consider our own composition as a research team. We are 16 conservationists and scholars in interdisciplinary spaces from diverse disciplines, including anthropology,

TABLE 1 Methodological overview of the multistudy design by the Disciplinary Inclusion Task Force.

	Study 1	Study 2	Study 3
Study focus	History and governance of SCB	SCB members	Nonmembers
Research question	How does SCB articulate inclusion of disciplinary diversity in guiding documents?	To what extent do SCB members from different disciplines feel included in SCB?	To what extent are nonmembers from diverse disciplinary backgrounds interested in joining SCB? How can SCB enhance its appeal and value to them?
Method	Content analysis—in vivo coding, presence–absence coding	Structured interviews, census sampling, member survey (5912 total members, 577 respondents)	Pilot interviews, river sampling nonmember survey
Scope	19 documents		213 respondents
Timeline	Data collection: August 2020 to March 2021 Data analyses: 9 July 2021	Pilot study: November 2020 to May 2021 Survey: 29 July 2021 to 8 October 2021 Data analyses: 24 October 2021 to 28 July 2023	Pilot study: May 2021 to August 2021 Survey: 28 September 2021 to 31 January 2022 Data analyses: 1 February 2021 to 4 August 2022
Barriers and limitations	Limited availability of SCB planning and policy documents due to decentralized approach to institutional knowledge management Oral histories of past and present SCB leaders would have strengthened interpretation, but time was limited.	Acceptable but limited response rate (~10%) The sociodemographic and disciplinary data of SCB members were unavailable, so whether sample was representative could not be confirmed.	Sample unlikely to be representative of all potential nonmembers across all disciplines because respondents were self-selecting from postings to listservs and social media; active solicitation at non-SCB conferences and events prevented by pandemic Despite multilingual efforts, the geographic coverage of respondents was mostly limited to the English-speaking world, particularly the United States.

Abbreviation: SCB, Society for Conservation Biology.

biology, geography, criminology, ecology, economics, history, policy, planning, and psychology. Although we were not able to represent all SCB sections, we have a heterogeneous team of people from rural and urban backgrounds representing the United Kingdom, Germany, Brazil, Costa Rica, Ecuador, Canada, and the United States. We work in academia, environmental nongovernmental organizations, governments, and the private sector and range in career stages from students to senior researchers with decades of engagement with SCB. Through our work, many of us experienced disciplinary exclusion through a lack of recognition of the value of our contributions in transdisciplinary contexts. These experiences motivated us to come together to assess DDI within SCB. Our diverse positionalities shaped the design of this study, including our decisions about who is a conservationist and whom we should engage in our study. We recognize limitations in our understanding of DDI, the privilege our backgrounds gave us, what our backgrounds denied us, and the colonial structures and harms that shaped our privilege and experiences.

METHODS

Background on SCB

The SCB was formally established in 1985 by a group of biologists whose mission was “to advance the science and practice of conserving Earth’s biological diversity” (<https://conbio.org/about-scb/who-we-are/>, accessed July 2023). The SCB is an international organization of over 4000 members led by 16

elected board members. Representatives are from each of the regional SCB sections: Africa, Asia, Europe, Latin America, North America, and Oceania. Member initiatives have created 12 topical or disciplinary working groups and many regional SCB chapters. Since 2012, SCB’s membership has decreased by more than half (Kareiva & Marvier, 2012), leading SCB to seek a better understanding of DDI and to restructure its organizational governance in order to better “align informal and formal power, address historic power inequities, and operationalize equity, inclusion, and diversity” (<https://conbio.org/about-scb/scb-transition/restructure-overview>).

Study design

We conducted a mixed-methods, multistudy investigation to assess SCB’s engagement and opportunities to improve DDI. We divided the DITF into 3 teams to investigate the past, present, and future barriers and facilitators to DDI (Table 1). Each team focused on complementary aspects of SCB: (1) institutional history, (2) member experience, and (3) nonmember experience. In the following section, we present a brief overview of the methods used in each study. For a full description and all survey materials, see [Appendix S1-3](#). The research design received approval from the University of Idaho (20-166), and the data are stored at Arizona State University (STUDY00017349). To maintain participant privacy, data were de-identified prior to sharing with SCB.

We collected all data during the height of the COVID-19 pandemic, which potentially affected our findings. For example,

there may have been fewer survey respondents among individuals who lacked internet access at home during lockdowns or had family care responsibilities that limited participation in studies like this one (Onyeaka et al., 2021).

Institutional history study

To understand how DDI is integrated into SCB institutional structures, we conducted a content analysis of relevant and available guiding documents and records ($n = 19$) representing the years 2006–2020. These included documents from SCB Global (i.e., board of governors; $n = 5$), SCB regional (i.e., sections; $n = 10$), and working groups ($n = 4$) (Appendix S1.1). We used an iterative approach to identify key themes as they relate to DDI (Bernard, 2017). First, we coded SCB Global documents with a line-by-line in vivo coding approach whereby SCB language was directly pulled into codes and organized into emergent themes as they related to the research questions (Saldana, 2011), specifically regarding who holds expertise and direction of knowledge exchange (e.g., scientists have knowledge to impart to policy makers, community-based organizations have expertise to share with scientists); partnerships and kinds of work required to achieve desired goals (e.g., education of youth, creation of policies); and kinds of diversity mentioned (e.g., disciplinary, ethnic, linguistic). We identified the range of responses under these 3 themes and created a codebook with 11 codes (Appendix S1.2). Using the codebook, we conducted a presence–absence test on each of the SCB regional documents to identify if they addressed each code, confirming results following the test to improve reliability. We additionally coded key qualitative information to contextualize the presence or absence of the codes. This allowed us to identify how prominent codes were across regional guiding documents, potential gaps, and ways in which DDI was considered.

SCB members study

To examine how SCB members understand SCB's mission and values and their perceptions of DDI in SCB, we used a 2-step approach. First, we conducted one-on-one scoping interviews with SCB members ($n = 17$) on internet calls to get a better sense of why they joined SCB, how they engaged with the Society, their feelings of inclusion, and how SCB could improve member experience. Themes from interviews were used to develop a member survey. Sections covered inclusion and value, engagement, brand, membership and representation, importance and performance, and sociodemographics. Questions had 4-point Likert scales with anchored (e.g., “none of my peers”) and unanchored (e.g., “strongly disagree”) response labels to avoid neutral responses (Johns, 2005). Some questions were open-ended, so participants could articulate responses with more depth. Nondemographic questions were randomized within sections to reduce potential bias. The survey was pilot tested by 10 SCB members over 18 years old to refine the questions and for-

matting (detailed methods in Appendix S2). The survey was in English, Spanish, and French, based on SCB membership data.

A census protocol was used to reach potential participants who held SCB membership from 2015 to 2020 ($n = 5912$). We used Qualtrics to disseminate the survey online, given the international sample. An SCB Global staff member sent an introductory email to all SCB members and provided reminders through member-only and public-facing communication channels (e.g., Conservation Connections, SCB listservs). To mitigate nonresponse bias, the survey population received 4 direct emails over 9 weeks. The Qualtrics survey platform was configured to limit ballot stuffing and response biases, for example, by employing skip patterns and question randomization (Table 1).

Incomplete surveys were omitted in subsequent analyses. We categorized respondents' disciplines based on participants' description of their discipline or retrieved data for an individual via web search (i.e., we used the participant's provided email in a web search to locate their self-described discipline in Twitter bios and institutional and personal websites). Participants self-identified 203 unique disciplines, which we collapsed into 9 disciplinary foci to identify broader trends. These categories were natural; social; socioecological; policy, planning, or management; computational or technological; education, outreach, or communication; veterinary; arts and humanities; and law and criminology (sample proportions in Appendix S2.3.1). Our analysis focused on natural and social science disciplines because they made up the bulk of the respondents and provided sufficient statistical sample sizes for analysis. We calculated descriptive statistics for each survey question, running additional segmentation analyses based on disciplinary identification, gender, and marginalization status. We did not weigh survey data during analyses because true statistics on the SCB population are unknown. We assessed the statistical significance of the members' survey with Bayesian cumulative ordinal models (Burkner & Vuorre, 2019) and 89% credible intervals (CrIs) (McElreath, 2018). All quantitative analyses were conducted in R, and figures were made using ggplot2 (Wickham, 2016). All custom code and anonymized data are archived on the Open Science Framework (<https://doi.org/10.17605/OSF.IO/G28DN>). Open-ended responses were included, where possible, to complement quantitative results.

Nonmembers study

To better understand nonmembers' perceptions of SCB, we developed a 4-section close-ended survey covering questions about membership in professional societies, motivations and barriers to joining professional societies, attitudes regarding societies' qualities and characteristics, and views of SCB. Surveys were built in Qualtrics and in English, Spanish, French, and Mandarin Chinese because these are widely spoken languages globally. Team members asked colleagues who were not SCB members to pilot test the survey to refine it for clarity. We followed similar distribution protocols as with the member survey. Detailed methods are provided in Appendix S3.

Students and professionals from conservation or related fields were eligible to participate so long as they were not current SCB members. Participants were recruited over the course of 16 weeks, starting in October 2021. In addition to the SCB communication channels, participants were recruited through listservs for conservation and related fields and outreach emails distributed within the authors' personal and professional networks. We also requested suggestions on potential platforms to further distribute the survey invitation. We used a river sampling approach, recruiting respondents online by inviting them to follow an online survey link (via web page, email, social media post, or listserv) or in person at relevant conferences and events. We encouraged recipients to share the survey invitation with their own networks (Lehdonvirta et al., 2021).

We calculated descriptive statistics for each survey question and did not weigh survey data during analyses. Analyses were conducted in Microsoft Excel, and figures were produced in R (Wickham, 2016). All eligible respondents were retained, and descriptive results were reported by survey item based on completions. We generated descriptive statistics from response counts.

RESULTS

Institutional history study

We identified 4 key themes across SCB Global documents: direction of scientific exchange and communication, framing of SCB in relation to sites of knowledge production, who is included as a part of the conservation community, and membership needs (content and emergent themes of SCB Global strategic plan in Appendix S1).

These documents revealed changes over time toward democratization of science, coproduction of knowledge, and appreciation of the value of diversity. For example, the 2006 Strategic Plan described SCB as a group of experts that can meet its mission by disseminating knowledge to others (one-way communication) with an explicit top-down approach in which knowledge flows from SCB members, as the experts, to others (e.g., policy makers, the public), as nonexperts. By 2011, SCB transitioned toward 2-way communication, demonstrating an understanding that SCB as an organization has something to learn from others (e.g., nonmembers and other conservation-related or conservation-adjacent communities). By 2016, SCB documents articulated an interest in bidirectional knowledge exchange and noted the value of diverse knowledges. Yet, SCB still described itself as a "global community of natural and social scientists and practitioners," excluding those who work in law, planning, arts and humanities, education, public health, medical sciences, and more.

The SCB strategic planning documents reflected similar shifts. The 2006 Strategic Plan, for example, included natural and social scientists in its scope, and, by 2011, SCB recognized the value of including nontraditional groups in the membership,

such as business and community leaders. By 2016, SCB planning documents included language around equity and diversity. Though no definitions, discussions, or strategies were provided to advance equity and diversity, the inclusion of these concepts created a space for SCB Global, sections, working groups, and members to be open to new approaches to conservation.

At the regional level, SCB section and working group documents largely reflected multidirectional knowledge exchange, whereby diversity, equity, justice, and inclusion were considered in achieving desired goals of biodiversity conservation (Figure 1). The majority of section and working group documents (86%) situated a theory of change within a top-down model whereby SCB members and experts share knowledge with others to achieve conservation goals. In this context, the language often used was, "to inform," "to disseminate," "to lead," and "to supply." In contrast, only 50% of documents mentioned bottom-up learning from others, whereby expertise is shared by those who have nontraditional or non-degree expertise to SCB. This appeared in various contexts, for example, SCB North America's 2021–2025 Strategic Plan to "increase outreach to underrepresented groups in conservation and engage groups that are currently undervalued in conservation efforts..." reflecting that underrepresented groups are worthy of inclusion for the value they can bring to conservation.

These documents also emphasized research (71%) and practice (64%) to achieve biodiversity outcomes, often mentioning the need for SCB to identify and support conservation research and application. Key mechanisms to work toward desired goals were largely through professional development and practitioner education (93%), informing policy (79%), and education of the public or youth (43%).

The SCB regional documents expressed many ways to center inclusion. Fifty percent of documents mentioned both social and disciplinary diversity, particularly in more recent documents; other forms of diversity were mentioned less frequently (e.g., underrepresented groups, 43%). Within SCB regional documents that did mention access as a barrier to inclusion (29%), it was mentioned in the context of membership costs and the need to translate across languages and create opportunities for visually impaired users.

The ways in which regional documents expressed diversity changed over time. For example, the 2015–20 North America Section Strategic Plan mission was "to advance the science and practice of conserving the Earth's biological diversity." This changed dramatically in their 2021–25 Strategic Plan, wherein the mission was stated as "to build an equitable and diverse community to advance the science and practice of conserving the Earth's biological diversity and people's places within it." Similarly, the 2019–21 Strategic Plan for the Africa section expressed, "While the section strives to increase capacity building and influence ecofriendly policies and conservation education across the continent, conservation work in Africa is best done at the grassroots." In these ways, sections and working groups recognized the value of DDI in their work.

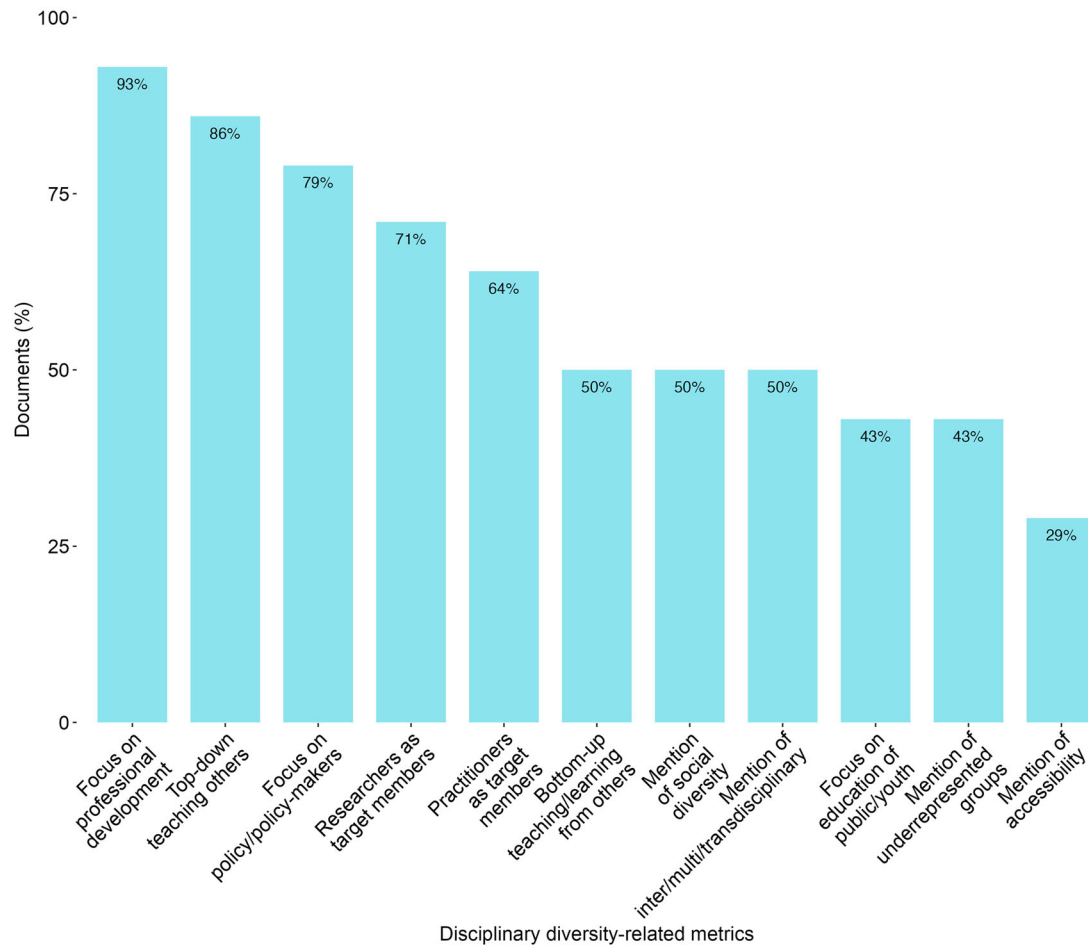


FIGURE 1 The content analysis results of disciplinary diversity-related codes from Society for Conservation Biology (SCB) regional group documents ($n = 14$) show that the majority of documents included a focus on professional development (93% of documents mentioned at least once), whereas only 29% of documents mentioned accessibility at least once.

SCB members study

We received 577 completed surveys from SCB members (10.98% response rate, margin of sampling error = 3.8%). Survey respondents represented a range of disciplines and sociodemographics (Table 2). Social scientists comprised only 16% of all respondents, though affiliates of the Social Science Working Group comprised the largest group of respondents, more than 3 times as many affiliates as Conservation Genetics, the second most frequently reported working group.

We segmented the population by disciplinary identification and self-described marginalization to assess how perceptions of inclusion might differ across key segments of the population. Most respondents (70%) were categorized as natural scientists, followed by social scientists (16%) and those in the more heterogeneous socioecological sciences (10%). Women respondents were more likely to be social scientists than natural scientists (odds ratio 89% CrI 1.07 to 2.51). Member respondents who self-identified as coming from marginalized backgrounds, including from countries in the Global South, believed SCB

to be less equitable than their counterparts (89% CrI -0.69 to -0.30). Qualitative results also addressed this relationship between geographic and disciplinary diversity. One respondent explained:

For all its good intentions, SCB is still not sufficiently interdisciplinary in its scope or engagement. The subtle superiority of the Global North still pervades the Society and its engagement with researchers from the Global South. I have not engaged too much with the Society because I do not experience it as a place I would feel completely included (R373).

Another respondent noted that DDI is inclusive of Indigenous knowledges and ways of knowing, recommending that SCB “Reconceptualize conservation biology in the context of Indigenous worldviews. The Society needs to be more ontologically and epistemologically inclusive” (R570).

We also examined the relationship between disciplinary identification and feelings of inclusion (Figure 2). Compared with

TABLE 2 Sample demographics and professional identity of members ($n = 577$; lower for some questions) and nonmembers of the Society for Conservation Biology ($n = 213$; lower for some questions).

Category	Nonmembers sample demographics	Members sample demographics
Gender identity	Woman (54%), man (38%), other (8% [e.g., self-describe, nonbinary queer, prefer not to answer])	47% women
Age	30–39 years (29%), 40–49 years (24%), 50–59 years (19%)	Mean (SD) = 51 years (12.5)
Country	Primary country of nationality: United States (65%), Canada (9%), United Kingdom (4%), Malaysia (3%)	Home country: United States (34.69%), Canada (5.84%), India (5.49%), Australia (4.78%), United Kingdom (4.25%), Malaysia (4.07%), Mexico (3.72%)
Household economic status: 1 (<i>struggling to meet basic needs</i>) to 5 (<i>very comfortable</i>)	5 (28%), 4 (35%), 3 (28%), 2 (8%), 1 (1%)	N/A
Self-categorized occupational sector	Academia (57%), student (9%), local NGO (9%), national agency (7%), international NGO (6%), other (13% [e.g., consulting, subnational government agency, intergovernmental agency, industry, and primary or secondary education])	Academia (59%), international NGO (11%), local NGO (10%)
Highest education qualification	Master's degree or postbaccalaureate degree (59%), bachelor's degree (27%), secondary/high school (11%)	
Years working in conservation	<5 years (15%), 5–10 years (25%), 10–20 years (28%), 20–30 years (17%), >30 years (17%)	
Main activity or responsibility (ranked 1 out of 3)	Social science or humanities research (38%), ecology or natural science research (25%), other (24% [e.g., environmental policy, environmental management, project monitoring and evaluation, advocacy, community organizing, fundraising, and engineering or technology])	N/A
Disciplinary identification	N/A	Natural sciences (70%), social sciences (16%), socioecological (10%), policy, planning, management (2%); <1% in computation and technology; education, outreach, and communication; veterinary; arts and humanities; law and criminology
Respondents who identify as part of a marginalized group	N/A	15%
Median years of reported SCB membership	N/A	5
Language	N/A	English (56%), Spanish (13%), French (3%), Portuguese (2%), Hindi (1%), Mandarin (1%), Bengali (1%), Arabic (1%), other unlisted languages (22%)

Note. See Appendix S2 for additional member figures and full results. See Appendix 3.3 for nonmember full results. Nonmember data are reported at a different level of detail from members due to the unknown nature of this population.

Abbreviations: NGO, nongovernmental organization; SCB, Society for Conservation Biology.

natural scientists, social scientists reported inadequate representation of interdisciplinarity (89% CrI -0.78 to -0.34); limited opportunities to learn about their discipline at society events (89% CrI -0.45 to -0.04); and marginally less opportunities to publish in SCB journals (89% CrI -0.42 to 0.01). One respondent wrote:

As a community development worker with limited training on environmental protection, I mostly don't find opportunities suitable for my background on this platform due to the continuous focus on biological science with little or no consideration for social disciplines. This is the main reason why I find it hard to engage in most of the activities, as I am never qualified (R518).

Both natural and social scientists expressed substantial interest in increasing opportunities to engage with conservationists in their discipline (89% CrI -0.02 to 0.42) and outside their disciplines (89% CrI -0.08 to 0.37); social scientists showed slightly more interest (Figure 2).

We asked members about their perceptions of diversity, inclusion, equity, and justice within SCB and conservation more broadly. Although trends across all 4 categories were similar (Figure 2), social scientists perceived SCB to be less equitable (89% CrI -0.65 to -0.24), diverse (89% CrI -0.56 to -0.14), inclusive, and just than natural scientists did. Notably, member respondents perceived SCB to be more equitable than the conservation field overall (89% CrI 0.68 to 0.47), but 30% of natural scientists felt that conservation is mostly or completely equitable compared to only 8% of social scientists (Figure 2).

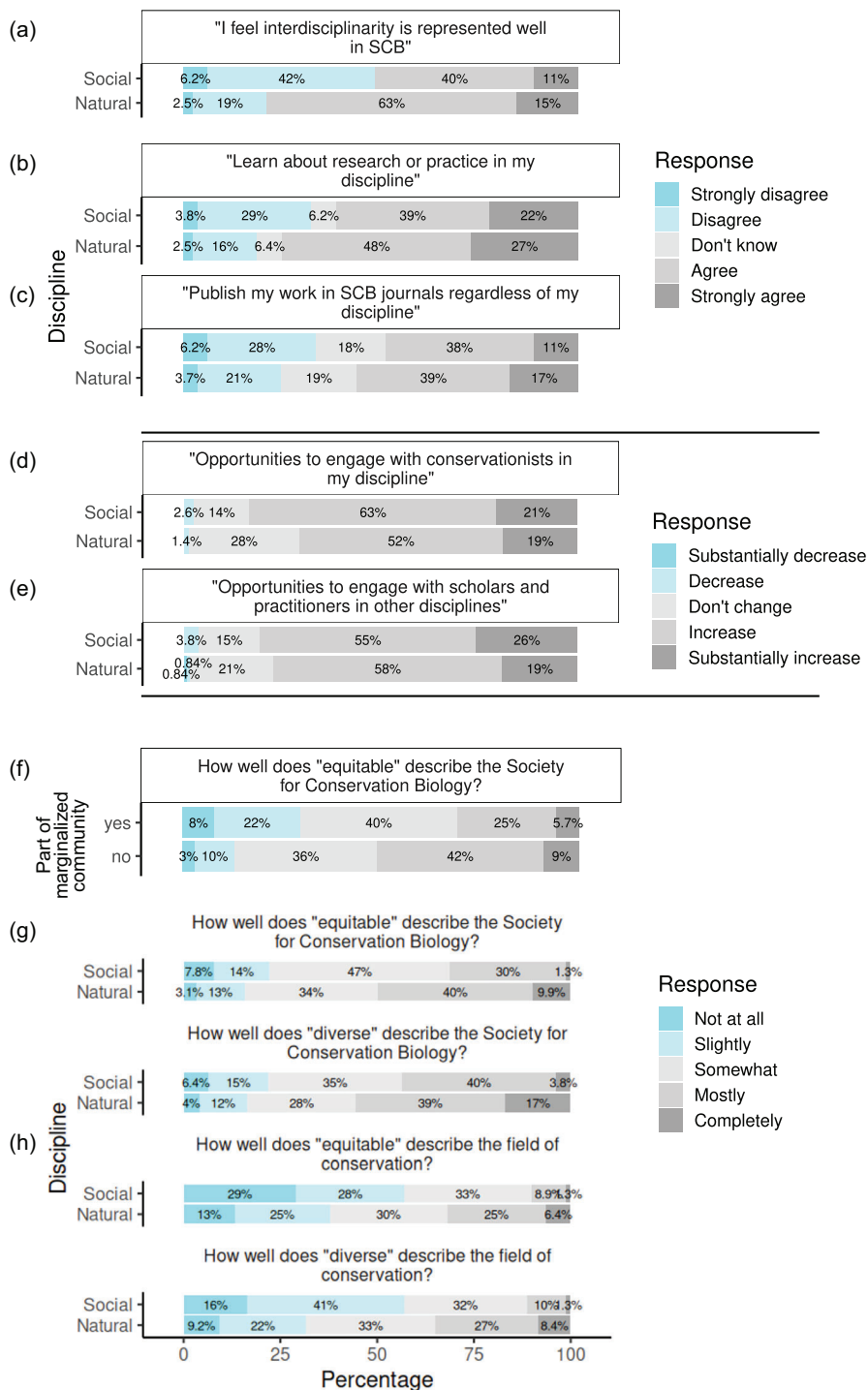


FIGURE 2 Society for Conservation Biology (SCB) members' beliefs about (a) representation of interdisciplinarity in SCB and agreement that SCB provides (b) opportunities to learn about disciplinary research and practice and (c) publishes regardless of discipline; member opinions on how SCB ought to change availability of membership benefits for engaging with conservationists in (d) one's own discipline and (e) outside one's discipline; and perceptions (f) of the SCB based on marginalization status and (g) discipline and of (g) the field of conservation based on discipline.

We asked SCB members how much influence they believed that they had on SCB decision makers. Almost half of social scientists disagreed (48%) that their opinions influenced SCB decision makers as much as any other member, compared with only 36% of natural scientists (Appendix S2). One respondent noted:

Conservation (and not just of biodiversity) requires a village. We can only manage people, so we must include academics and others that know how to do this effectively. Without them, conservation is doomed... But we need to make SCB an obvious home for experts in this field if

TABLE 3 Views of survey respondents who were not members of the Society for Conservation Biology.

Survey question	Response categories	Responses (%)
Given its mission of “advancing the science and practice of conserving biodiversity,” how well does your work fit into the Society for Conservation Biology? (<i>n</i> = 196)	Very well	25
	Reasonably well	44
	Neither well nor poorly	24
	Poorly	5
	Not at all	2
Are you interested in becoming a member of the Society for Conservation Biology? (<i>n</i> = 197)	Yes	20
	Yes, if they...	11
	Unsure	37
	Sometime in the future	15
	No	17
The Society for Conservation Biology describes itself as “the premier international membership society for professionals, students, and nonprofits dedicated to advancing the science and practice of conserving biodiversity.” To what extent do you agree with this statement? (<i>n</i> = 195)	Strongly agree	22
	Somewhat agree	27
	Uncertain	41
	Somewhat disagree	7
	Strongly disagree	3

we are truly going to advance conservation goals (R538).

Relatedly, another member noted that SCB has made progress in recent years to be more inclusive of diverse disciplines and perspectives and called for a redoubling of these efforts, saying, “... the SCB does function as a ‘big tent’ and it was on that basis that I became involved as a social scientist. There is more to be done, for sure, but it is headed in the right direction. No backsliding now, please” (R514). Combined, these comments underscore that member respondents understood and valued disciplinary inclusion and felt that SCB was headed in “the right direction.”

Non-SCB members study

A total of 213 individuals initiated the survey—202 in English, 6 in French, and 4 in Spanish. Of these, 192 completed the survey (sample demographics descriptions in Table 2). Most survey respondents reported <20 years of experience in the field, with 39% under 10 years, primarily in academia. Over a third reported a current focus in social science and humanities, whereas about a quarter were working in natural sciences (Table 2).

We asked respondents whether they felt their work aligned with SCB’s mission, were interested in becoming a member of SCB, and agreed SCB was “the premier international membership society for professionals, students, and nonprofits dedicated to advancing the science and practice of conserving biodiversity” (Table 3). Nearly half of respondents believed that their work fits “reasonably well” with the mission of SCB. However, only 20% were certain they were interested in joining SCB, and almost the same proportion of respondents were certain they were not interested in joining. Few respondents disagreed

with the characterization of the description of SCB as the premiere conservation science organization (10%). However, the number of respondents who were unsure about this description (41%) was nearly as high as those who agreed (49%).

We asked whether respondents were members of other societies; most were (80%, *n* = 199) (Appendix S3). We also asked respondents, “If you choose not to join a society, how important are the following factors in that decision not to join?” The question was followed by a list that included cost, lack of perceived benefits, lack of professional fit, mismatch in values, lack of representation, too many societal memberships, or some other barrier. Membership costs were the top barrier to joining a society (26%). Fourteen percent of respondents reported that not being permitted to join a society (i.e., as part of the conditions or requirements of employment) was a top barrier to society membership. A lack of perceived benefits—either that there were none (13%) or that they were unclear (7%)—was reported by the next highest number of respondents as a reason for not joining.

Finally, we asked respondents, “For the societies in which you are a member, what are the benefits that most motivate your membership?” and “... least motivate your membership?” (Appendix S3.2.2). We asked respondents to select 3 from a list of 12 benefits and to rank them from 1 to 3, with 1 being the most important (i.e., most or least motivating, respectively). Thirty-one percent of respondents selected “Networking opportunities with friends and colleagues” as the most important motivator to join a society, followed by discounts for publications, conferences, training workshops, and journal subscriptions (16%) and general interest in the subject matter (13%). The benefit considered by most respondents to be least influential was the opportunity to sell products or services (68.9%), though the professional sectors of most respondents likely made this the most inapplicable motivating factor. The

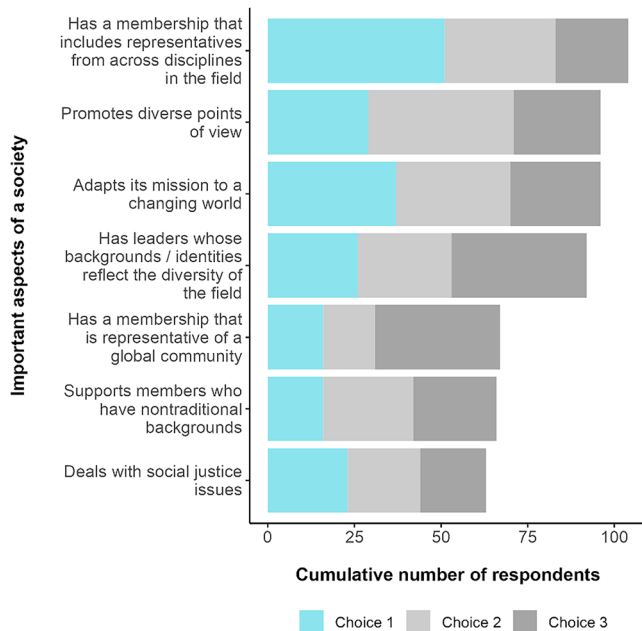


FIGURE 3 Ranking of the importance of diversity and social justice issues for a professional society ($n = 195$) by respondents who were not members of the Society for Conservation Biology.

second least motivating factor appears to be opportunities for discounts, followed by “to find a job” and “to see new projects or services.” We directly asked respondents, “How important is it to you that a society ...” and then had them select 3 of 8 potential choices to rank from *most important* (1) to *third most important* (3) (Figure 3). Twenty-six percent selected “a membership that includes representatives from across disciplines in the field” as important, with another 15% wanting, foremost, a society that “promotes diverse points of view” and another 13% selecting that it is most important that a society “has leaders whose backgrounds/identities reflect the diversity of the field.”

DISCUSSION

We set out to understand DDI within SCB and provide recommendations on how to make SCB—a professional society of an inherently transdisciplinary field—more disciplinarily diverse and inclusive.

Institutional history study

Our content analysis revealed that SCB is moving toward greater consideration for the inclusion of nonnatural scientists and other practitioners and knowledge holders in mission statements and other strategic directives. First, SCB recognizes accessibility as a key challenge toward full participation across disciplines. Given that accessibility may vary across target demographics, SCB Global could identify key dimensions of access (e.g., abilities, financial, linguistic, cultural) and strategize effective ways to influence and track access improvements.

Second, SCB Global appears to increasingly prioritize multidirectional learning within their guiding documents, meaning SCB may be engaging more with the practice of knowledge coproduction. Coproduction is a process whereby diverse interested parties come together to value many ways of knowing and expertise for the betterment of science (Toomey, 2023). However, not all regional documents reflected this priority because top-down learning approaches remained present in 86% of documents, whereas only 50% recognized value in bottom-up learning. This presents an opportunity for SCB to identify whether and where the coproduction of knowledge offers a means to achieve desired conservation goals. This importantly requires identifying key partners in conservation, currently a major gap across planning documents.

There appears to be a gap in terms of whether and how SCB understands its role in producing socially alienating outcomes of the conservation sector, for example, advocating for the use of fences and fines to remove communities traditionally associated with high-biodiversity landscapes (e.g., Brandon & Wells, 1992; Pimm, 2021). It is possible that these outcomes, or unintended consequences, have driven the growth in demand for DDI in the Society toward a more socially just conservation practice (e.g., Teel et al., 2018). Like other conservation societies, SCB has the opportunity to lead in inclusive and generative conservation practice, a shift that would benefit from an interrogation of the history of the Society and an intentional view toward equity across disciplines and ways of knowing. Siloed knowledge perpetuates echo chambers that can be combatted through equitable inclusion of diverse perspectives, knowledges, and methodologies (Toomey, 2023). Groups, including SCB, that create a thoughtful, engaging community may reduce the risk of alienating any potential new members. In this way, guiding documents set the aspirations for how the Society advances disciplinary inclusion, but whether and how current and prospective members feel included is where theory is put to the test of reality.

SCB members study

Our survey results demonstrated a difference in perceived power and influence based on disciplinary identification. Overall, natural scientist respondents, who make up the majority of the membership, reported feeling more included and satisfied with opportunities provided by SCB, whereas social scientist respondents, who are a minority in the Society, felt less included and satisfied. Moreover, member respondents’ perceptions of how responsive SCB is to member opinions appeared linked with the perceived influence members have on leadership. Broadly, social scientists felt that SCB was less responsive to their concerns. Our results are consistent with hierarchies of knowledge that have been documented in other studies, which cast social sciences as less important than natural sciences like biology (Cohen, 2016). Furthermore, we found evidence that links disciplinary diversity with sociodemographic diversity. This finding is also consistent with other studies about conservation scientists that found that conservationists who were

women, hailed from Africa, Asia, and Latin America, or had training outside of the natural sciences were more in favor of people-centered conservation compared with conservationists with exclusively natural science training or who identified as men (Sandbrook et al., 2019). This is likely because social science and transdisciplinary training have a stronger emphasis on the role and importance of people in conservation, although the direction of causality is not clear (Luque-Lora et al., 2022; Sandbrook et al., 2019). Likewise, despite conservation diversifying over the last few decades, women and scholars from the Global South are still significantly underrepresented in publishing (Maas et al., 2021). Because professional societies play an important role in training and advancing academic careers, future studies might investigate this nexus of disciplinary, social, demographic, and geographic diversity to advance DDI.

The SCB faces the challenge of weighing its current natural science-focused membership, with its more disciplinarily diverse aspirations. Our results demonstrated that SCB's mission remains a mutually shared goal among conservationists. To address biodiversity loss and achieve SCB's mission, solutions that integrate insights from social, political, economic, humanist, ecological sciences, and Indigenous ways of knowing have the power to change individual and collective human behavior (Bennet et al., 2017; Hernandez, 2022). Natural scientists strongly supported increasing opportunities to engage across disciplines. However, SCB would benefit from identifying new ways to unify conservation practitioners and researchers across disciplines to achieve this goal. Members strongly support actions to enhance cognitive and disciplinary diversity, including fostering engagement, rebranding, and providing more resources for members from low- and middle-income countries. These results demonstrated that SCB has not yet achieved equity in disciplinary diversity. However, SCB does not keep records of member demographics, which prevented us from verifying whether our sample was representative. Nonetheless, surveyed members recognized the value of DDI and supported policy changes to address unequal opportunities, power, and decision-making capacity.

Nonmembers study

Survey results from non-SCB members demonstrated that there is a significant group of people whose work aligns with SCB's mission but who lack a strong interest in joining the Society. Our results indicated 3 key insights about this opportunity. First, current membership pricing appears to be a deterrent for non-SCB members, even though respondents were primarily from comfortable socioeconomic classes. The impact of cost on membership decisions may extend beyond financial constraints and could be influenced by individuals' perceptions of value. This is supported by respondents who reported that perceived lack of benefits (or not knowing about them) would also factor into their decision-making around membership. These results echo findings from a 2015 SCB climate survey in which 39% of nonmembers cited a lack of financial support from employers,

demonstrating that this still remains a major barrier (Susi et al., 2015).

Second, a lack of DDI within the SCB may dissuade nonmembers from joining. Most nonmembers felt that SCB was exclusively focused on biological sciences and unreflective of their own areas of work, even though they did feel their work aligned with the mission of the SCB. In corollary, many respondents also reported that SCB is not connected with their own professional identity. This is further supported by the finding that most respondents considered subject matter interest and the perceived lack of representation of their area of work to be key incentives or barriers to joining professional societies in general. It is for this reason that being inclusive was identified as one of the 10 rules for starting up new scientific societies (Gaëta et al., 2017). Third, respondents noted the importance of a professional society being able to adapt its mission and infrastructure to the changing field and challenges of conservation—a field that is now more complex and diverse than when SCB was first established. This is necessary not only to meet the needs of conservation challenges in the face of massive global change (Armsworth et al., 2015) but also because notions about what conservation is and what professions are involved in conservation have changed significantly (e.g., Bennett et al., 2017; Sanborn & Jung, 2021; Wright et al., 2015). Adapting language used to describe SCB's identity, mission, and vision may be an important facet of attracting more diverse members.

Our work revealed nonmembers may gravitate toward associations aligned with their personal and professional interests and commitments, such as advancing conservation activism and social justice issues. For example, the Marine Section launched the Jairo award for conservation activism and the Social Science Working Group released a Justice Position statement in 2020.

One limitation was the majority of respondents were from the United States, which is consistent with the geographic skew of SCB's membership. Although additional efforts to connect conservationists from outside of this geopolitical boundary with SCB could improve DDI, the nonmembers survey highlighted barriers to DDI that may still be relevant throughout the rest of the world.

Identifying trends to advance DDI

Through our 3 independent studies, we sought to identify trends and recommendations that can potentially help SCB and other conservation organizations advance DDI efforts. To synthesize our findings, the DITF commissioned a macro trends assessment in 2020 (full methods and results in Appendix S4). Macro trends refer to business trends outside of an organization's control that likely influence its operation (Postma & Papp, 2020). The goal of the assessment was to identify relevant trends that affect membership-based professional organizations across sectors and influence recruitment strategies and advance DDI; specifically, "How is SCB currently delivering on association industry trends?" As the number of conservation-relevant

organizations and sources of information increase, current and potential members of the conservation community face a range of choices for what groups to affiliate with. Three main macro trends relevant to member-based organizations were identified: advocacy and support, next-generation needs, and everything online. The macro trend assessment aided our understanding of ongoing significant shifts in professional expectations and behaviors that could potentially impact SCB's future relevance to a diverse membership base. We discussed these findings in tandem with those from our 3 independent studies and devised recommendations that can potentially help SCB and other conservation organizations advance DDI efforts.

First, although SCB and the wider field of conservation have long centered DDI as crucial to meeting conservation goals (Soule, 1985), our findings demonstrated a persistent gap between academic discussions and actual commitments and actions toward DDI experienced by both members and non-members alike. Echoing findings from the 2015 SCB Member Survey (Susi et al., 2015), we found that SCB has faced challenges in fully operationalizing existing research and responding to repeated calls for action to effectively support and include diverse membership within the Society (Teel et al., 2018). This can potentially pose a threat to SCB's long-term relevance. Globally, there is a growth of heterogeneous conservation communities (Capra, 2002), among whom SCB must find its place to reach a disciplinarily diverse membership. The SCB members have previously been shown to have relatively highly transdisciplinary professional affiliations with a variety of organizations (Nyssa, 2020). Still, individuals have limited time and resources to participate in different membership organizations.

Second, younger generations of conservationists may be more likely to represent diverse disciplines, be trained in transdisciplinary practices (Mazzocchi, 2019), and be more internationally focused (Elliott et al., 2018). To better address the needs of the next generation and diversify membership, SCB could focus on creating greater access to research, local and professional communities, and resources for those still in school and those eschewing traditional career pathways. The SCB working groups have initiated mentoring programs (e.g., Social Science Working Groupmentor match) and continue to increase online access to content (e.g., webinars, conferences), which can help diversify conservation. Overall, we found many exciting efforts occurring on a more grassroots level, and there are opportunities for SCB Global to elevate and promote these initiatives across the organization.

Furthermore, the next generation of conservationists favors organizations that prioritize advocacy; thus, organizational purpose is no longer enough (Ardoin et al., 2023). Within conservation, this may mean that prospective members align with the removal of cultural, systemic, and institutional barriers to equity and social justice (Washington et al., 2024; Wyborn et al., 2021). Our work revealed that current and future SCB members may gravitate toward associations aligned with their personal and professional interests and commitments. The SCB has begun the process of advancing conservation activism and social justice via awards and public position statements. For

example, the Marine Section launched the Jairo award for conservation activism and the Social Science Working Group released a Justice Position Statement in 2020. However, there is room for SCB to increase impact in this area. Moreover, SCB can stand apart organizationally by lowering the barriers to entry via a variety of membership options that can increase access for scholars from the Global South and practitioners or individuals without institutional funding for professional memberships.

Combined, our studies showed that SCB offers great potential value to members, largely due to networking and learning opportunities, though prospective members may not see the value of these opportunities if they believe SCB predominantly serves natural scientists. Widening the membership tent may not be enough to improve DDI in SCB. As with other types of diversity initiatives, substantive efforts are needed to empower and engage younger generations who tend to be more transdisciplinary, increase access to professional resources, and promote career advancement for underrepresented disciplines (Smith et al., 2017). Specifically, as effective conservation principles expand with the inclusion of diverse disciplinary practices, members and prospective members may engage with SCB through non-SCB channels, for example, in collaborative events (e.g., social media, listservs, or other societies).

We began this study approaching DDI through the lens of representation of practitioners and scholars from a wide range of disciplines. Our results demonstrate that DDI is as much about the inclusion of people from diverse disciplines as it is about what can be gained when we prioritize the value of decolonizing conservation. Taken together, SCB's commitment to DDI may be less about reaching a more diverse audience and more about transforming the kinds of work they do (as more than natural science) and how they do it. This could not only improve SCB's value to the conservation field but also solidify its role as a leader in transformative conservation practice.

Drawing from our findings, we present 4 major opportunities for SCB to better meet DDI goals, each with key challenges with actionable recommendations that SCB can embrace to better meet the needs of diverse conservation professionals and a more inclusive vision of conservation practice (Table 4). We recognize that SCB is currently undergoing a major restructuring effort that took place in parallel with our research. However, with this in mind, many of the challenges and opportunities we identified remain relevant and, when combined, could offer a holistic approach to shepherd SCB further on its journey to inclusive conservation.

Although SCB continues to provide a professional home primarily for natural scientists from the Global North, the implementation of strategic and ongoing adaptive management can help SCB evolve into a more pluralistic and inclusive society. The SCB is a global leader in the growing and diversifying conservation field and can improve its own relevancy through thoughtful and adaptive representation, communication, outreach, and engagement with a variety of stakeholders and potential members. In reaching a more diverse audience, SCB can become a transformative leader, shaping a more inclusive conservation sector.

TABLE 4 Opportunities for the Society for Conservation Biology (SCB) to improve commitment to disciplinary diversity and inclusion (DDI), challenges hindering SCB from reaching goals, and actionable recommendations identified through this study to improve DDI within SCB.

The opportunity	The challenge	Actionable recommendations
Improve access for present members	Accessibility issues hinder members from disciplinarily diverse communities and backgrounds from engaging with SCB.	Offer user-friendly services and hybrid options. Provide translations across multiple languages. Improve website navigability. Offer funding and reduced cost options for members from underrepresented communities and disciplines.
Support recruitment of diverse future members	SCB membership continues to predominately attract or connect with natural scientists from the Global North.	Focus on what makes SCB unique among peer organizations. Continue to provide a gathering space for conservation professionals from diverse geographies. Continue to support a networked organizational structure that empowers focused regional and working groups. Develop and track metrics and indicators of DDI and adapt where goals fall short.
Develop intentional recruitment of diverse leadership	SCB leadership is primarily composed of natural scientists from the Global North.	Leadership that is representative of diverse geographies and disciplines may be more responsive to the challenges and opportunities to increase DDI. Develop guidelines to intentionally recruit and retain members from underrepresented disciplines. This could direct funding and resources to ensure full engagement across disciplines, for example, to compensate for time served on the board or to meet quotas for leadership participation from representatives of various disciplines. Establish new board positions to enhance DDI across SCB.
Build strategic partnerships beyond SCB	Unclear partnerships and strategic collaborations hinder how SCB works toward effective conservation.	SCB Global and regional sections could identify strategic partners from across relevant disciplines or specific knowledge holders to increase DDI among members and share SCB-specific work with partners. SCB could cohost events with peer or partner organizations to strengthen DDI and shared learning; for example, the 2022 Latin American Congress for Conservation Biology was cohosted by SCB and the Sociedad Mesoamericana de Biología y Conservación (tinyurl.com/LACCA2022).

Future directions




Professional societies, and member-based organizations broadly, face extraordinary challenges in the coming years—challenges that have been accelerated by the global pandemic and rapidly changing social, political, and technological contexts. We join many other scholars and activists in suggesting that to make conservation more effective and equitable over the long term, organizations such as SCB must find ways to engage new members from diverse disciplines and with underrepresented ways of knowing—particularly those with perspectives that differ from those in power and amplify their voices and influences (Bailey et al., 2020; Gewin, 2018). The DITF's results suggest that a transdisciplinary approach centered on epistemic justice may include ways of knowing and forms of expertise that have often been marginalized in conservation science. Empirical evidence and analyses from DDI assessments can help ensure professional societies implement responsive policies and activities concerning diversity, equity, and inclusion. Valuing and respecting diverse disciplines and ways of knowing may enable conservation sciences and organizations to meet the moment for our planet.

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SUPPORTING INFORMATION

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

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