



DESENVOLVIMENTO  
E MEIO AMBIENTE

BIBLIOTECA  
DIGITAL  
DE PERIÓDICOS  
BDP | UFPR

revistas.ufpr.br

## 'People lie': overcoming obstacles to incorporate social science research to biodiversity conservation

### *"As pessoas mentem": superando obstáculos para incorporar a pesquisa em ciências sociais à conservação da biodiversidade*

Silvio MARCHINI<sup>1,2,3\*</sup>, Maria Augusta de Mendonça GUIMARÃES<sup>3</sup>, Paloma ALCÁZAR-GARCÍA<sup>1</sup>, Wezddy DEL TORO-OROZCO<sup>4,5</sup>, Bruna Lima FERREIRA<sup>6</sup>, Jenny Anne GLIKMAN<sup>7</sup>, Maria Carolina Las Casas e NOVAES<sup>8</sup>, Joana Silva MACEDO<sup>9,10</sup>, Flavia de Campos MARTINS<sup>11</sup>, Miguel Coutinho Moretta MONTEIRO<sup>5</sup>, Roberta Montanheiro PAOLINO<sup>3</sup>, Joana Gomes PEREIRA<sup>12</sup>, Ana Carolina PONT<sup>13</sup>, Iara RAMOS-SANTOS<sup>14</sup>, Raquel Costa da SILVA<sup>15,16</sup>, Ana Carolina D. OLIVEIRA<sup>17</sup>

<sup>1</sup> University of Oxford, Oxford, Oxfordshire, United Kingdom.

<sup>2</sup> Institute for the Conservation of Neotropical Carnivores, Atibaia, SP, Brazil.

<sup>3</sup> University of São Paulo (USP), Piracicaba, SP, Brazil.

<sup>4</sup> University of Georgia (UGA), Athens, GA, United States.

<sup>5</sup> Mamirauá Sustainable Development Institute (IDSM), Tefé, AM, Brazil.

<sup>6</sup> University of São Paulo (USP), Ribeirão Preto, SP, Brazil.

<sup>7</sup> Institute of Advanced Social Studies (IESA-CSIC), Córdoba, Córdoba, Spain.

<sup>8</sup> Paulista State University (UNESP), Rio Claro, SP, Brazil.

<sup>9</sup> Institute for Socio-Environmental Action (ASA), Cachoeiras de Macacu, RJ, Brazil.

<sup>10</sup> Refauna, Rio de Janeiro, RJ, Brazil.

<sup>11</sup> University of Pernambuco (UPE), Petrolina, PE, Brazil.

<sup>12</sup> cE3c - Centre for Ecology, Evolution and Environmental Changes & CHANGE - Global Change and Sustainability Institute, Faculdade de Ciências, Universidade de Lisboa (ULisboa), Lisboa, Portugal.

<sup>13</sup> Instituto Chico Mendes para Conservação da Biodiversidade (ICMBio), Torres, RS, Brazil.

<sup>14</sup> Federal University of Pará (UFPA), Belém, PA, Brazil.

<sup>15</sup> State University of Campinas (Unicamp), Campinas, SP, Brazil.

<sup>16</sup> National Center for Research and Conservation of Carnivorous Mammals (CENAP), Chico Mendes Institute for Biodiversity Conservation (ICMBio), Atibaia, São Paulo, Brazil.

<sup>17</sup> Brazilian Institute of the Environment and Renewable Natural Resources (IBAMA), Brasília, DF, Brazil.

**ABSTRACT:** Despite the acknowledged importance of interdisciplinarity in biodiversity conservation, there is still resistance to incorporate social science research (SSR) to both conservationist thinking and practice. The reasons for such a resistance can be summarized in three general statements still commonly attributed to SSR, namely: it is of 'little use' and it has 'less methodological rigor' than research in the natural sciences and, above all, it is unreliable because 'people lie'. The current essay was developed based on the experience of participants of a community of practice (formed by professionals from different fields and sectors associated with conservation), as well as on discussions held in this space of collective learning. It addresses the limitations and misconceptions behind the aforementioned statements. SSR is not less useful in conservation and not less methodologically rigorous than research conducted in the natural sciences. When researchers are lied to, the problem does not lie on the research itself, but on the subject-researcher relationship. We herein argue that as conservationists become more familiar with SSR, and as principles like equity and justice are incorporated to conservation values and goals, both the importance and need of SSR in conservation become obvious, making the lack of trust between researcher and subjects no longer a significant concern. Increasing capacity, integrating and supporting are our basic recommendations for researchers, educators, managers and decision-makers in the conservation, teaching, publishing and funding fields, so that SSR can fully fulfill its role in conservation.

*Keywords:* biodiversity; decision-making; interdisciplinarity; social sciences; transdisciplinarity.

**RESUMO:** Mesmo com o reconhecimento da importância da interdisciplinaridade na conservação da biodiversidade, ainda há resistência em incorporar a pesquisa em ciências sociais (PCS) ao pensamento e à prática conservacionista. As razões para tal resistência podem ser resumidas em três afirmações gerais ainda comumente atribuídas à PCS: "tem pouca utilidade" e "menos rigor metodológico" quando comparada à pesquisa em ciências naturais e, sobretudo, é pouco confiável porque "as pessoas mentem". Neste ensaio, desenvolvido a partir da experiência dos participantes de uma comunidade de prática, formada por profissionais de diversas áreas e setores relacionados à conservação, e das discussões geradas nesse espaço de aprendizado coletivo, abordamos as limitações e os equívocos por trás das afirmações acima. A PCS não é menos útil na conservação e nem tem menos rigor metodológico do que a pesquisa em ciências naturais, e quando as pessoas mentem para o pesquisador o problema não está na pesquisa em si, mas na relação entre sujeito e pesquisador. Argumentamos que à medida que os conservacionistas se familiarizam com a PCS e que os princípios de equidade e justiça são incorporados aos valores e objetivos da conservação, a importância e necessidade da PCS na conservação tornam-se óbvias, e a falta de confiança entre pesquisador e sujeitos deixa de ser uma preocupação significativa. Capacitar, integrar e apoiar são nossas recomendações básicas para pesquisadores, educadores, gestores e tomadores de decisão nas áreas de conservação, ensino, publicação e financiamento, para que a PCS cumpra plenamente seu papel na conservação.

*Palavras-chave:* biodiversidade; ciências sociais; interdisciplinaridade; transdisciplinaridade; tomada de decisão.

## 1. Introduction

It is long acknowledged that people must be taken into consideration at the time to conserve and

manage biodiversity (Leopold, 1949). After all, the problems that biodiversity conservation aims to solve are not in wildlife or their habitat, but, ultimately, in people and their means of produc-

---

tion and subsistence (Kareiva & Marvier, 2012). Therefore, it is essential to understand the human dimension of problems involving conservation to solve them (Bennett *et al.*, 2017a). Actually, social science research (SSR) has been incorporated into conservation in recent decades, although natural sciences have historically been prevalent and, in many cases, the only source of information for decision-making focused on biodiversity management processes (Bennett *et al.*, 2017b).

This new approach has contributed to develop alternatives that take human well-being into consideration for the conservation context. Concepts, such as justice and equity, have been receiving increasing attention from researchers and conservationists. People have different conditions to achieve the same subsistence and well-being goals within different contexts. Equitable alternatives aim at ensuring that every individual has the necessary conditions to achieve well-being and this condition changes depending on individuals' social class and culture (Leach *et al.*, 2018). The 2004 Convention on Biological Diversity was the milestone for justice and equity incorporation to the definition of conservation goals, since it takes the fair and equitable sharing of benefits deriving from nature as one of its pillars. Since then, there has been a movement to ensure fair biodiversity conservation actions, i.e., to ensure the proper distribution of its benefits and to prevent its costs from falling on any particular segment of society and on nature itself (Shoreman-Ouimet & Kopnina, 2015). It is necessary to acknowledge and integrate different segments of society in conservation-related decision-making processes (Massarella *et al.*, 2020).

However, despite the trend to replace the original paradigm of “nature despite people” with the mostly inclusive concept of “people and nature” (Sanborn & Jung, 2021) and, more than that, the outspread of multinatural perspectives to help disrupt the human versus nature dichotomy (Latour, 2004; Connolly & Nelson, 2023), the process to incorporate SSR to biodiversity conservation practices still faces barriers, such as lack of acknowledgment and distrust by some conservationist groups – mostly by those with training in natural sciences – about the usefulness, quality and, more specifically, the reliability of information generated by this research type (Bennett *et al.*, 2017b). “People lie” remains an emblematic reaction by many biodiversity conservation professionals when people are used as an information source.

SSR has its challenges and limitations, just as natural sciences research has its own. However, these challenges and limitations are often perceived in a distorted and exaggerated way by researchers, managers, and decision-makers in the biodiversity conservation field; besides, they are used as justification for adopting usual approaches, with emphasis on natural sciences. This resistance has imposed restrictions on interdisciplinary research<sup>1</sup> and on transdisciplinary collaboration<sup>2</sup>, which are both acknowledged as essential to successful large-scale conservation (Margules *et al.*, 2020). The current essay reflects personal experiences that its authors – all participant members of a community of practice in human-wildlife coexistence – have had with such resistance to incorporate SSR into biodiversity conservation processes.

<sup>1</sup> While two, or more, disciplines contribute in parallel in the multidisciplinary approach, the perspectives of different disciplines – such as ecology and psychology, for example – inform each other in the interdisciplinary approach (Newing, 2011; Klein, 2017).

<sup>2</sup> Transdisciplinarity refers to transformative approaches capable of creating new perspectives that transcend disciplinary boundaries; it may involve non-academic participants, such as managers and the general public (Stock & Burton, 2011; Lang *et al.*, 2012).

---

## 2. *Community of practice in human-wildlife coexistence*

Community of practice (CoP) refers to a group of people who share an interest or passion for what they do, and who learn from each other to do better as they interact on a regular basis (Wenger, 2020). It is featured by free experience and knowledge sharing among its members, in a participatory and non-hierarchical manner (Wenger & Snyder, 2000). Unlike formal work groups that focus on generating a final product or service, CoPs aim at the continued learning and development of its members (Wenger & Snyder, 2000). The concept of CoP has been used in different sectors, such as companies, as well as in governmental and non-governmental organizations (Wenger, 2020), and it has been gaining recognition, year after year. The environmental field comprises CoPs focused on developing more sustainable infrastructures (Global Green-Gray Community of Practice), on landscape conservation (Network for Landscape Conservation) and on natural resource management (Collaborative Conservation and Adaptation Strategy Toolbox).

The Community of Practice in Human-Wildlife Coexistence (also known as CoPCoex) was created by taking into consideration the benefits of the CoP's format, and the growing need of improving research and management practices focused on human-wildlife interactions. To the best of our knowledge, it is the first CoP in this specific domain. This CoP was launched in August 2019 by a group of 14 researchers and conservationists who were members or collaborators of the Wildlife Ecology, Management and Conservation Laboratory at "Luiz de Queiroz" School of Agriculture, University of São Paulo (ESALQ-USP), Piracicaba City, São Paulo State. Nowadays, CoPCoex has 112 members,

including professionals and students from different fields, such as Biology, Veterinary Medicine, Psychology, and Forestry Engineering, who mainly work in the teaching and research fields. It also comprises public managers, social movements and third sector representatives, public servants, and independent consultants. Most of its members are Brazilian citizens, although it also holds participants from Argentina, Chile, Costa Rica, Mexico, Peru, Spain, Portugal, and Israel, whose age ranges from 19 to 56 years old.

CoPCoex members interact through a messaging application (WhatsApp) and through meetings held on a regular basis. Meetings were initially held in a hybrid mode, i.e., they combined in-person and remote participation through video conferencing applications. However, CoPCoex started exclusively operating in a virtual environment during the Covid-19 pandemic, and so it remains to the present time. Meetings are currently held every two months and gather from 20 to 30 participants. The topic to be addressed and the guests to share experiences at each meeting are selected in advance based on participants' suggestions. Urban fauna, One Health, ecotourism, citizen science, and decolonization are examples of topics already covered in these meetings, which are recorded and made available to members, along with bibliographical references and other materials associated with each topic. CoPCoex is open to new members who can have access to an explanatory document comprising the group's history, its operation, and general guidelines to attend the meetings. In addition to the individual development of its members, CoPCoex also works as a platform for collaborations involving members' participation in congresses and in other events, in the process to hold internal courses, as well as in

---

the production of articles, among other promotional pieces.

Difficulties faced by participants who carry out SSR - whether because academic panel members question the robustness of the adopted methods, because managers and decision-makers doubt the quality of the results, or because funders do not acknowledge the relevance of this approach – became a recurrent topic in CopCoex’s discussions. Whenever participants reported some experience associated with this topic, others shared similar experiences about SSR discredit, and it broadened these discussions to the point where the idea of writing about this topic has emerged. Therefore, we decided to make our reflections on these difficulties, and our suggestions on how to overcome them, public. The wide variety of reported experiences was summarized in three complementary statements: SSR (1) ‘has little use’ in biodiversity conservation, (2) it ‘has less methodological rigor’ than natural sciences research and, above all, it is unreliable because (3) ‘people lie’ in their responses to researchers. Misconceptions and limitations behind each of these claims are addressed below.

### ***3. Obstacles to incorporate SSR to biodiversity conservation***

#### ***3.1. SSR ‘has little use in biodiversity conservation’***

Resistance to the incorporation of PCS has its roots in the historical process in which the tra-

ditional conservation model was developed<sup>3</sup>. The aim of this model is to save threatened species and ecosystems (Soulé, 1985) by adopting approaches (almost) exclusively based on natural sciences research, without taking into consideration human populations. Assumingly, the contribution of natural sciences research lies in ensuring the best conservation decisions; consequently, these decisions should be made by experts in this field. There is no doubt that the application of this conservation model has brought relevant results. However, biodiversity remains threatened by human activities that must be understood in their different scales, from individual behaviors to global markets and policies. In fact, lasting solutions depend on adequate understanding of the sociocultural dimensions of the problem (Bennett *et al.*, 2017a).

The trend to place natural sciences as priority in decision-making remains common in conservation processes. In many cases, natural science professionals plan project activities by prioritizing the understanding of species; only then, they take into consideration the need of looking at people who share space with them, even when these activities would be better approached altogether. It is necessary taking into consideration local values, interests and issues, before starting any process to collect ecological or social data to avoid unilateral top-down approaches and to encourage actions based on co-participation, equity and social justice focused on promoting transparency and trust among social groups involved in this process.

Furthermore, the SSR approach applied to biodiversity conservation is often equated with environmental education. This reductionist perspec-

<sup>3</sup> In the section titled ‘Underlying debates: differences between the natural and social worlds’, Newing (2011) overall addresses the objectivity issue - or lack thereof - in social research and, more specifically, in social research applied to conservation, he addresses the historical division between quantitative and qualitative research traditions from epistemological and ontological perspectives.

---

tive contributes to the idea that SSR has little use in biodiversity conservation, or that it should only come after ‘scientific knowledge’ acquisition, so it can be used to ‘educate’ local populations. Although SSR is useful to guide environmental education, social sciences applied to biodiversity conservation is more than just education, since it aims at describing, predicting, analyzing and changing both thoughts and behaviors.

It is worth pointing out the need of providing a more critical environmental education to be used by individuals as an instrument to question and improve their knowledge, to contribute to the complexity of socio-environmental issues (Farias & Knechtel, 2019). Effective conservation strategies combine education with financial and social incentives, engagement with local populations and structural changes to change specific behaviors (Heberlein, 2012). The relevance of adopting broader perspectives, such as governance and political ecology, to ensure sustainable transformations in biodiversity conservation has been increasingly acknowledged (Büscher & Fletcher, 2019; Massarella *et al.*, 2021).

SSR is useful in biodiversity conservation, and given the growing interest in transdisciplinary collaboration as a form of knowledge production (Torkar & McGregor, 2012) and in equity and justice as guiding principles (Buscher & Fletcher, 2019), the usefulness of SSR becomes clear and indisputable. Actually, there is a trend towards interdisciplinarity in teaching, research, management and public policies, as well as increasing attention to stakeholders (Decker *et al.*, 2012). Concepts such as alternative knowledge (Malmer *et al.*, 2020), collaborative governance (Ullah & Kim, 2020), decolonization (Trisos *et al.*, 2021), power, and

social justice (Buscher & Fletcher, 2019), have been quickly incorporated into biodiversity conservation.

### 3.2. SSR ‘has low methodological rigor’

SSR, be it of quantitative or qualitative nature, follows well-established protocols to ensure robust results, as in any other scientific field. However, the idea that SSR is a second-class, soft science (Hedges, 1987) in comparison to ecological research, due to lack of methodological rigor, accuracy and objectivity, is still common. SSR is often seen as simpler and more easily developed in the conservation context because of the perception that it requires less training and preparation than research conducted in the natural sciences field.

There has been increasing use of questionnaires in conservation studies, although they are mainly used to complete primary research approaches focused on both species or ecosystems. They are often inadequately designed and applied, since their reliability and validity is not taken into consideration (Browne-Nunez & Jonker, 2008). Natural scientists use to include SSR at the time to write fundraising projects and proposals, but they do it based on unrealistic goals (e.g. ‘changing the behavior of 50% of poachers’ or ‘conducting 1,000 interviews within 2 months’) and without including appropriate budget items to pay researchers and field assistants to carry out the SSR. Social scientists are commonly only requested when the project or the program is already outlined or even underway, and they are asked to deliver unrealistic SSR components. This factor perpetuates a vicious cycle in which lack of acknowledgement and care leads to research with

---

inadequate methodologies, compromising the quality and usefulness of the results, and also reinforces the notion that the information obtained in this way is neither reliable nor valid.

Quantitative SSR makes extensive use of controlled experiments, mathematical models and statistical analyses to provide accurate and objective results (Newing, 2011). Psychometric theories and techniques are used to develop reliable scales for the variables of interest, such as risk perception, tolerance and management actions' acceptance (Whitehouse-Tedd *et al.*, 2021). Emerging methods based on new technologies have significantly broadened scientists' ability to collect and analyze social data. Smartphones are currently used by laypeople to provide scientific data to citizen-science initiatives, and big data analysis techniques enable researchers to extract relevant information from social media posts, videos and online news reports (Arbieu *et al.*, 2021). Virtual ethnography and sentiment analysis of tweets are examples of methods adopted by new scientific fields, such as digital anthropology (Coleman, 2010) and conservation culturomics (Correia *et al.*, 2021).

Moreover, qualitative SSR allows a better understanding of the factors underlying the issues to be overcome. Data collection methods and analytical tools used to ensure robustness in qualitative research involve intensive long-term involvement in the investigated community, data validation by respondents, search for speech discrepancies and negative cases, catalytic validation or crystallization, and responses' triangulation (Maxwell, 2013; Rose & Johnson, 2020). Qualitative and quantitative methods' selection depends on several factors that range from research aims to available resources

(time and funding, for example), as well as on researchers' skills. However, the most effective research strategies often combine quantitative to qualitative approaches.

### 3.3. 'People lie'

In fact, people can lie. They can also omit or provide information that does not correspond to reality, due to lack of knowledge. However, unlike natural science research, SSR has two fundamentally different goals, namely:

- (1) revealing the world's objective reality and
- (2) exploring the subjectivity of human thoughts and feelings.

Revealing the world's objective reality requires understanding if what people say corresponds to the 'truth', whereas the process to explore the subjectivity of human thoughts and feelings must focus on one's own thoughts and feelings, regardless of their relationship with the objective reality. In-person interviews may not be the most appropriate approach to get accurate estimates about the number of animals killed in places where hunting is forbidden, for example. Still, it may be the method of choice to help better understand one's personal motivations to kill, and it is equally relevant in management-related decision-making processes. Therefore, SSR is often criticized for something it does not set out to deliver. However, some conservationists' stronger identification with the first goal type reinforces the concern with lack of information veracity in SSR.

---

Concern with lying prevails in research about sensitive topics that can make respondents feel uncomfortable for personal, moral or legal reasons (e.g., poaching). In these cases, lack of trust between researcher and interviewee can lead to dishonest answers or to information omission. SSR provides several tools and techniques to collect sensitive data capable of providing reliable results (Cerri *et al.*, 2021). Examples include the collaboration from well-known and respected local assistants to act as interlocutors between researcher and other community members (Bisol, 2012), and the Randomized Response Technique, which has been used to estimate the prevalence of behaviors in the study population and to generate more reliable data while preserving respondents' privacy (Nuno & St John, 2015).

In any case, scientists must recognize lies as a source of error, analyze the factors leading interviewees to lie or to hide the truth, and take them into consideration at the time to design the methodology to be applied. For example, people may lie when they suspect that researchers' values and interests are antagonistic to their own. Thus, it is essential to be careful about the way researchers are inserted in the study environment (Thiollent, 2003), as well as in providing clear information about their research goals, which must be aligned with interests of the affected social groups to create a relationship of trust between researcher and groups or individuals interviewed.

#### ***4. Suggestions to incorporate SSR to biodiversity conservation***

Both individuals (researchers, teachers, managers and decision makers) and institutions in the

conservation, academic, editorial and development sectors have a role to play in bringing together and in integrating natural and social sciences, as well as in adopting good practices of SSR applied to conservation (Figure 1). The suggested measures were divided into three complementary lines of action – increase capacity, integrate and support – that, altogether, form the theory of change in order to incorporate SSR to biodiversity conservation (Figure 2).

##### *4.1. Increase capacity*

4.1.1. Seek formal and/or informal training based on Social Sciences theories and methods.

4.1.2. Keep an open mind to contributions from different disciplines. This applies to researchers and educators, managers and decision makers, regardless of their academic background.

4.1.3. Include Social Sciences disciplines, mainly the SSR ones, in conservation training and management courses.

4.1.4. Provide SSR training opportunities and incentives to members of governmental and non-governmental institutions' teams.

##### *4.2. Integrate*

4.2.1. Co-design and implement strategies to ensure interdisciplinarity both in educational and governmental/non-governmental institutions.

4.2.2. Promote environments to enable dialogue among professionals from different knowledge fields, such as communities of practice and seminars focused on integrating natural to social sciences.



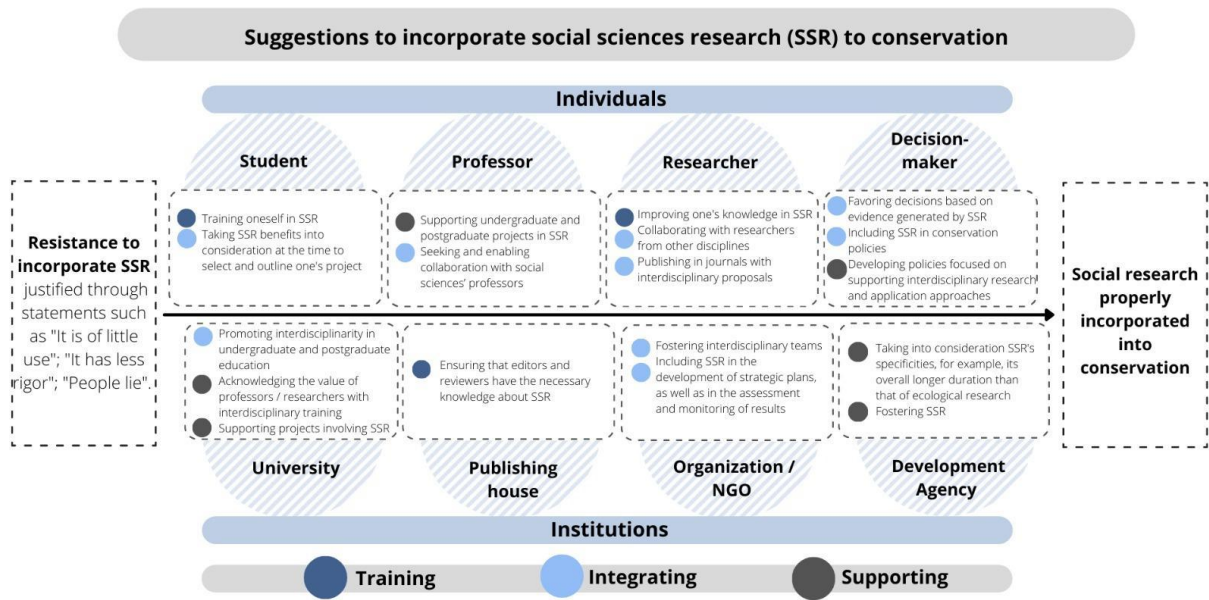


FIGURE 1 – Suggestions to incorporate Social Sciences Research (SSR) to biodiversity conservation  
SOURCE: elaborated by the authors.

4.2.3. Boost collaborative and interdisciplinary research by valuing scientific articles written by authors from the social and natural sciences fields.

4.2.4.. Consider the inclusion of social aspects of research, even if the main objective is ecological research.

4.2.5. Take SSR benefits into consideration at the time to select and outline projects, as well as acknowledging local knowledge as collaborator in the development of all research stages.

4.2.6. Include SSR in the process to develop strategic plans, as well as to assess and monitor results.

4.2.7. Favor decisions based on SSR-generated evidence and including SSR in conservation policies.

4.2.8. Promote integrated programs between wildlife researchers and managers (e.g., active participation in research councils and projects).

4.2.9. Value both the methods and the work of all individuals involved in social research (e.g., social research-specific analysis methods).

4.2.10. Develop interdisciplinary courses and programs based on the collaboration of people from different knowledge fields.

# Overcoming obstacles to incorporate social sciences research to biodiversity conservation

## Motivation

**Greater acknowledgement** from the importance of social sciences research due to **changes in conservation values and goals**

however there are...



## Obstacles

summarized in:

"It has little use in biodiversity conservation"

"It has less methodological rigor"

"People lie"

that can be overcome  
with these...



## Recommendations

### TRAINING

researchers and decision-makers for social sciences research purposes

### INTEGRATING

disciplines (interdisciplinary procedures) and actors (transdisciplinary procedures)

### SUPPORTING

through funding agencies, the publishing sector and undergraduate programs

and it could result in...



**Social Sciences Research duly incorporated to biodiversity conservation**

FIGURE 2 – Theory of change to incorporate social sciences research (SSR) to biodiversity conservation research and practice.

SOURCE: elaborated by the authors.

---

### 4.3. Support

4.3.1. Encourage interdisciplinarity in scientific dissemination channels by including professionals trained in Social Sciences in conservation articles' publication processes.

4.3.2. Encourage conservation research and practice proposals focused on using social research whose goals were conjointly defined since the beginning of the project.

4.3.3. Ensure that editors and reviewers have the necessary knowledge about SSR.

4.3.4. Acknowledge the value of professors / researchers with interdisciplinary training.

4.3.5. Support undergraduate and postgraduate projects involving SSR.

4.3.6. Develop policies focused on supporting interdisciplinary research and application approaches.

4.3.7. Take into consideration SSR's specificities - for example, its overall longer duration and the fact that it generates less quantitative data than ecological research – at the time to promote SSR.

### 5. Future directions

Social science research plays an essential role in helping conservation processes to achieve positive results for both biodiversity and people involved in them and, therefore, to be more sustainable. However, SSR has not been fully incorporated to conservation, and it is both cause and consequence of divergent interests among some conservationists, researchers and the affected social segments, which, oftentimes, result in conflicts and injustice. In fact,

there has been an increasing call for a more socially fair conservation aimed not only at saving endangered species, but at ensuring human well-being as well (Vucetich *et al.*, 2018; Massarella *et al.*, 2021).

As 'environmental justice' replaces specific conservation values ('Something is right when it tends to preserve biotic community's integrity, stability and beauty, and it is wrong when it does the opposite', Aldo Leopold, 1949) as guiding principle for decision-making, it paves the way for a more inclusive and equitable approach applied to all individuals involved in this process. It is the case of the emerging 'coexistence approach' to both the research and management of human-wildlife interactions (Pooley *et al.*, 2021; Marchini *et al.*, 2021), whose emphasis lies on transdisciplinary collaboration aimed at improving individuals' relationships with wildlife - be it endangered or abundant, native or exotic - to benefit both the wildlife and people involved in this process (Glikman *et al.*, 2019). These ongoing paradigm shifts will give SSR the acknowledgment it deserves. Consequently, it will be properly incorporated into conservation sciences and practice, and people affected by conservation decision-making processes will finally have more reason to collaborate with, than to lie to, researchers.

### Acknowledgment

The authors would like to thank all members of the Community of Practice in Human-Wildlife Coexistence (also known as CoPCoex) who shared their ideas and experiences about SSR application in biodiversity conservation, as well as the anonymous reviewers who helped to improve the current manuscript.

---

## References

- Arbieu, U.; Chapron, G.; Astaras, C.; Bunnefeld, N.; Harkins, S.; Iliopoulos, Y.; Mehring, M.; Reinhardt, I.; Mueller, T. News selection and framing: the media as a stakeholder in human-carnivore coexistence. *Environmental Research Letters*, 16(6), 2021. doi: 10.1088/1748-9326/ac05ef
- Bennett, N. J.; Roth, R.; Klain, S. C. *et al.* Conservation social science: understanding and integrating human dimensions to improve conservation. *Biological Conservation*, 205, 93-108, 2017a. doi: 10.1016/j.biocon.2016.10.006
- Bennett, N. J.; Roth, R.; Klain, S. C. *et al.* Mainstreaming the social sciences in conservation. *Conservation Biology*, 31(1), 56-66, 2017b.
- Bisol, C. A. Estratégias de pesquisa em contextos de diversidade cultural: entrevistas de listagem livre, entrevistas com informantes-chave e grupos. *Estudos de Psicologia*, 29, 719-726, 2012. doi: 10.1590/S0103-166X2012000500008
- Browne-Núñez, C.; Jonker, S. A. Attitudes toward wildlife and conservation across Africa: a review of survey research. *Human Dimensions of Wildlife*, 13, 47-70, 2008. doi: 10.1080/10871200701812936
- Büscher, B.; Fletcher, R. Towards convivial conservation. *Conservation & Society*, 17, 283-296, 2019. doi: 10.4103/cs.cs
- Cerri, J.; Davis, E. O.; Veríssimo, D.; Glikman, J. A. Specialized questioning techniques and their use in conservation: a review of available tools, with a focus on methodological advances. *Biological Conservation*, 257, 2021. doi: 10.1016/j.biocon.2021.109089
- Coleman, E. G. Ethnographic approaches to digital media. *Annual Review of Anthropology*, 39, 487-505, 2010. doi: 10.1146/annurev.anthro.012809.104945
- Connolly, E.; Nelson, H. Jaguars in the borderlands: multinatural conservation for coexistence in the anthropocene. *Frontiers in Conservation Science*, 4(10), 2023. doi: 10.3389/fcosc.2023.851254
- Correia, R. A.; Ladle, R.; Jarić, I. *et al.* Digital data sources and methods for conservation culturomics. *Conservation Biology*, 35, 398-411, 2021. doi: 10.1111/cobi.13706
- Decker, D. J.; Riley, S. J.; Siemer, W. F. *Human dimensions of wildlife management*. Baltimore: JHU Press, 2. ed., 2012.
- Farias, A. L.; Knechtel, M. do R. A subjetividade contemporânea: uma nova fronteira para a educação ambiental. *Ambiente & Educação*, 24(2), 68-97, 2019. doi: 10.14295/ambeduc.v24i2.9494
- Glikman, J. A.; Frank, B.; Marchini, S. Human-wildlife interactions: multifaceted approaches for turning conflict into coexistence. In: Frank, B.; Glikman, J. A.; Marchini, S. (Eds.) *Human-wildlife interactions: turning conflict into coexistence*, Cambridge, Cambridge University Press, 439-452, 2019.
- Heberlein, T. A. *Navigating environmental attitudes*. New York: Oxford University Press, 1. ed., 2012.
- Hedges, L. V. How hard is hard science, how soft is soft science? The empirical cumulativeness of research. *American Psychologist*, 42, 443-455, 1987. doi: 10.1037/0003-066X.42.5.443
- Kareiva, P.; Marvier, M. What is conservation science? *Bioscience*, 62, 962-969, 2012. doi: 10.1525/bio.2012.62.11.5
- Klein, J. T. Typologies of interdisciplinarity. *The Oxford handbook of interdisciplinarity*, 2, 21-34, 2017.
- Lang, D. J.; Wiek, A.; Bergmann, M.; Stauffacher, M.; Martens, P.; Moll, P.; Thomas, C. J. Transdisciplinary research in sustainability science: practice, principles, and challenges. *Sustainability Science*, 7, 25-43, 2012.
- Latour, B. *Politics of nature: how to bring the sciences into democracy*. Cambridge, MA: Harvard University Press, 2004.
- Leach, M.; Reyers, B.; Xuemei, B. *et al.* Equity and sustainability in the anthropocene: a social-ecological systems perspective on their intertwined futures. *Global Sustainability*, 1(13), 1-13, 2018. doi: 10.1017/sus.2018.12
- Leopold, A. *A sand county almanac and sketches here and there*. New York: Oxford University Press, 1. ed., 1949.
- Malmer, P.; Masterson, V.; Austin, B.; Tengo, M. Mobilization of indigenous and local knowledge as a source of usable

- evidence for conservation partnerships. In: Sutherland, W. J.; Brotherton, P.; Davies, Z.; Ockendon, N.; Pettorelli, N.; Vickery, J. (Eds.) *Conservation research, policy and practice*. London: Cambridge University Press, p.82-113, 2020.
- Marchini, S.; Ferraz, K. M. P. M. B.; Foster, V. *et al.* Planning for human-wildlife coexistence: conceptual framework, workshop process and a model for transdisciplinary collaboration. *Frontiers in Conservation Science*, 2, 1-11, 2021. doi: 10.3389/fcosc.2021.752953
- Margules, C.; Boedihartono, A. K.; Langston, J. D. *et al.* Transdisciplinary science for improved conservation outcomes. *Environmental Conservation*, 47, 224-233, 2020. doi: 10.1017/S0376892920000338
- Massarella, K.; Sallu, S. M.; Ensor, J. E. Reproducing injustice: why recognition matters in conservation project evaluation. *Global Environmental Change*, 65, 2020. doi: 10.1016/j.gloenvcha.2020.102181
- Massarella, K.; Nygren, A.; Fletcher, R. *et al.* Transformation beyond conservation: how critical social science can contribute to a radical new agenda in biodiversity conservation. *Current Opinion in Environmental Sustainability*, 49, 79-87, 2021. doi: 10.1016/j.cosust.2021.03.005
- Maxwell, J. *A qualitative research design: an interactive approach*. Los Angeles: SAGE Publications, 3. ed., 2013.
- Newing, H. *Conducting research in conservation: social science methods and practice*. London: Routledge, 3. ed., 2011.
- Nuno, A.; St. John, F. A. V. How to ask sensitive questions in conservation: a review of specialized questioning techniques. *Biological Conservation*, 189, 5-15, 2015. doi: 10.1016/j.biocon.2014.09.047
- Pooley, S.; Bhatia, S.; Vasava, A. Rethinking the study of human-wildlife coexistence. *Conservation Biology*, 35, 784-793, 2021. doi: 10.1111/cobi.136531
- Rose, J.; Johnson, C. W. Contextualizing reliability and validity in qualitative research: toward more rigorous and trustworthy qualitative social science in leisure research. *Journal of Leisure Research*, 51, 432-451, 2020. doi: 10.1080/00222216.2020.1722042
- Sanborn, T.; Jung, J. Intersecting social science and conservation. *Frontiers in Marine Science*, 8, 2021. doi: 10.3389/fmars.2021.676394
- Shoreman-Ouimet, E.; Kopnina, H. Reconciling ecological and social justice to promote biodiversity conservation. *Biological Conservation*, 184, 320-326, 2015. doi: 10.1016/j.biocon.2015.01.030
- Soulé, M. E. What is Conservation Biology? *Bioscience*, 35, 727-734, 1985. doi: 10.1016/0169-5347(87)90031-0
- Stock, P.; Burton, R. J. Defining terms for integrated (multi-inter-trans-disciplinary) sustainability research. *Sustainability*, 3(8), 1090-1113, 2011.
- Thiollent, M. *Metodologia da pesquisa-ação*. São Paulo: Cortez, 12. ed., 2003.
- Torkar, G.; McGregor, S. L. Reframing the conception of nature conservation management by transdisciplinary methodology: from stakeholders to stakeholders. *Journal for Nature Conservation*, 20(2), 65-71, 2012.
- Trisos, C. H.; Auerbach, J.; Katti, M. Decoloniality and anti-oppressive practices for a more ethical ecology. *Nature Ecology & Evolution*, 5, 1205-1212, 2021. doi: 10.1038/s41559-021-01460-w
- Ullah, I.; Kim, D. Y. A Model of collaborative governance for community-based trophy-hunting programs in developing countries. *Perspectives in Ecological Conservation*, 18, 145-160, 2020. doi: 10.1016/j.pecon.2020.06.004
- Vucetich, J. A.; Burnham, D.; Macdonald, E. A. *et al.* Just conservation: what is it and should we pursue it? *Biological Conservation*, 221, 23-33, 2018. doi: 10.1016/j.biocon.2018.02.022
- Wenger, E. *Communities of practice: a brief introduction*. 2020. <http://hdl.handle.net/1794/11736>
- Wenger, E. C.; Snyder, W. M. Communities of practice: the organizational frontier. *Harvard Business Review*, 78(1), 139-146, 2000.
- Whitehouse-Tedd, K.; Abell, J.; Dunn, A. K. Evaluation of the use of psychometric scales in human-wildlife interaction research to determine attitudes and tolerance toward wildlife. *Conservation Biology*, 35, 533-547, 2021. doi: 10.1111/cobi.13599