



Policy Forums

Demanding but not sharing: barriers and counteracting strategies for compilation of biodiversity data from researchers and practitioners



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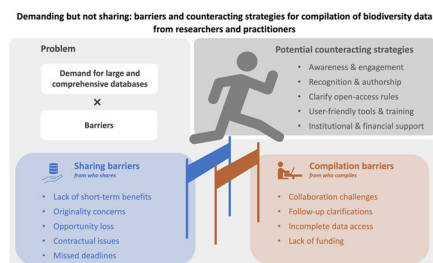
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HIGHLIGHTS

- There is a paradox: a demand for large databases and a resistance to creating them.
- Resistance barriers were identified by those who shared and those who compiled data.
- Strategies are proposed to encourage individuals and institutions to participate.

GRAPHICAL ABSTRACT



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ABSTRACT

The urgency of the environmental crisis calls for evidence-based conservation, demanding comprehensive databases. However, there is resistance among researchers and practitioners regarding data sharing and participation in the development of such bases. Drawing from experiences compiling wildlife data in Brazil, we identified two categories of resistance barriers: "sharing barriers" faced by who shares the data and "compilation barriers" faced by who compiles the data. Key sharing barriers include the lack of short-term benefits and concerns about originality, authorship credit, and contractual issues. Compilation barriers involve difficulties in engaging and contacting collaborators, incomplete data submissions, and a critical lack of funding. To counteract these challenges, we propose several strategies: raising awareness of the benefits of data sharing, reinforcing open access policies and principles, developing user-friendly spreadsheets and tutorials, and securing funding for data compilation projects. Adopting these measures is crucial to foster a more collaborative process and accelerate the creation of valuable open data sets for conservation.

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Context

The current environmental crisis is alarming, and biodiversity conservation decisions often need to be made quickly or even immediately. To ensure that these interventions are accurate and successful, decisions must be evidence-based (Christie et al., 2020; Sutherland et al., 2004). Therefore, the production of evidence syntheses is increasingly sought after by researchers and practitioners as a robust method to summarize existing knowledge, minimize bias, and inform decision-making (Cooke et al., 2023; Pullin, 2012; Sutherland et al., 2019).

To assemble generalizable evidence for conservation actions, it is crucial to combine data collected from multiple contexts. Research projects remain a key source of data, as they typically produce valuable case studies from different regions that, when combined, can result in large data sets covering extensive geographical areas (Aubin et al., 2020). But sources of biodiversity information extend far beyond research data sets. For example, new species or new occurrences can be obtained from environmental impact assessments of infrastructure projects (de Oliveira et al., 2024). Regardless of the data origin, it is urgent to make scattered biodiversity and conservation action information accessible and reusable (Binley et al., 2024; Kadykalo et al., 2021). The community of applied or conservation science is increasingly recognizing the relevance of biodiversity synthesis and, consequently, the value of open science, and reproducible and transparent data (Heberling et al., 2021). One way to create extensive data compilations is through collaboration between individuals and institutions (Aubin et al., 2020). However, many researchers and practitioners are still reluctant or fail to share their data publicly (Enke et al., 2012).

Barriers to data sharing, encompassing personal, corporate, or ethical considerations, have already been listed (Gomes et al., 2022). This highlights a paradox: while there is a demand for comprehensive databases to increase understanding of key conservation issues, there is also a resistance to sharing and assisting in the development of such databases. Drawing from our experience, this letter aims to highlight the barriers we faced during the compilation of wildlife data from two initiatives in Brazil, which supported the elaboration of two data papers: one already published (Franceschi et al., 2024) and another still in progress (Dasoler et al., 2021; <https://nerf-ufrgs.github.io/WildCROSSData/>). These initiatives mainly relied on data shared by researchers and environmental consultants; therefore, the barriers discussed here reflect the perspectives and experiences derived from these data-sharing processes. In addition, we discuss some potential strategies to address and counteract these barriers. It is important to note that this contribution is made with the conviction that assembling large data sets that comprise as much information as possible requires proportional commitment from all participants but rewards multiple researchers and practitioners with the opportunity to answer questions and find solutions to problems not previously attainable.

Perceived barriers

We categorized barriers into two groups: those related to who shares the data (called “sharing barriers”) and those related to who receives and organizes the data and prepares the open access data set (called “compilation barriers”). Sharing barriers are based on the responses and comments we received during communications with potential collaborators who intended to share or actually shared their data in our above-cited initiatives. Compilation barriers are related to the challenges we faced during the compilation and curation processes of the received data and the subsequent preparation of publications.

Sharing barriers

Potential collaborators perceive no short-term benefit

Researchers and practitioners tend to show more interest in

collaborating when there are direct and immediate benefits. However, when the resulting product is a data paper, for example, there is a considerable time lag before the data are published, and the collaborators are properly recognized. This prolonged process seems to be a disincentive for them to share their data.

Potential collaborators fear losing originality

Many researchers fear losing the originality aspect of the paper(s) they intend to write with their own data. They are also concerned about unethical use of their data, such as unintentional misinterpretation, selective use, or uses that may not align with the original context or purpose of the data. Consequently, they choose to share only data that has already been published elsewhere or provide only part of their unpublished data.

Potential collaborators are apprehensive about losing opportunities

There is a concern that the authors of the data may not be sufficiently acknowledged or credited for their efforts or that they may receive fewer invitations to collaborate on further studies if they make all the data publicly available. Part of this arises from the significant effort made by the authors when collecting data, often with limited financial resources and under hard fieldwork conditions. It may also be founded on a sense of ownership that makes researchers hesitant to share “their” data unless they have exclusive control over its use (Gomes et al., 2022).

Potential collaborators are reluctant due to contractual issues

Even professionals willing to share data may have concerns when the data comes from environmental impact assessments for permitting processes. When invited to collaborate, they refrain from sharing data by claiming data confidentiality and the lack of authorization imposed by their employers.

Potential collaborators miss deadlines

Some collaborators say they do not have enough time to fill out the data in the requested format for sharing due to other job demands. Their original data format often does not fit into the standardized spreadsheet adopted in data paper initiatives, making the process time-consuming. This usually happens with researchers and practitioners working with extensive data sets. Others, even among those interested in contributing, simply forget to respond to the invitation, due to other multiple professional commitments.

Compilation barriers

Difficulty in engaging potential collaborators

It is challenging to reach and motivate researchers, consultants, and environmental practitioners of governmental agencies, private companies, and non-governmental organizations to share and collaborate in open-access data set initiatives. Many of these potential collaborators do not respond to invitations, sometimes because they are not familiar with the team coordinating the initiative. In some cases, there is a specific representative responsible for sharing the data, and we cannot tell whether we failed to reach the target person, or they were not interested in collaborating, or they did not have data to share. The time invested in searching for collaborators is high while the return is low, which increases the effort required to continue searching for other collaborators.

Challenges in following up with collaborators

During the data review process, collaborators are required to improve or clarify issues that arise regarding their data, and sometimes

the person who sent the data does not know how to handle them. Additionally, there is a high turnover in the positions of many researchers and practitioners, particularly in early-career positions (Gomes et al., 2022; Keeley et al., 2019). So, even when we received a response from the person who sent the data, they may not be able to reach colleagues who were more familiar with the data because they no longer work together. This job rotation, sometimes with multiple changes in contact information for a single collaborator, hampers communication during data and manuscript review, prolonging the data curation and subsequent publication process.

Incomplete access to the entire existing data

Identifying situations in which potential collaborators share only an unknown fraction of their entire data set (from the point of view of the compilation team) is challenging. Omitting part of the data could introduce bias in the patterns to be described in future analysis of the compiled database, potentially weakening the effectiveness of decisions based on this information.

Lack of financing for compilation and publication

Our experience preparing two data papers, both initiated during dissertation and thesis projects, involved teams working without any additional financial support for data paper preparation. The lack of funding makes the entire process slower, postponing data availability by years. Franceschi et al. (2024) took four years to compile, revise and publish all data, while the second data paper (Dasoler et al., 2021) is still in progress, four years since the initiative started. This project is currently being fully developed by a team of volunteers. Despite their claimed relevance for knowledge advancement, data set compilation projects are understood as lower priority and thus less competitive for regular funding sources.

Potential counteracting strategies

Overcoming the barriers enumerated above is challenging. Below we present some pathways we identified from our experience that can be adopted to surpass these barriers and promote a more collaborative process of data set compilation. While some of these strategies are easier to implement than others, we advocate for a comprehensive consideration. By adopting these strategies, we expect to increase not only the number of collaborators and amount of data made available but also to hasten the process of multisource data compilation and publication.

- 1 The team coordinating the initiative should raise awareness about the importance of sharing information and the credibility of their project. Rather than using only a directed invitation message or an announcement of the initiative in thematic specialist forums, the project should also be presented in invited meetings (in person or online) where potential collaborators could uncover their fears and doubts about attending the project. These meetings could be sectoral or multi-sectoral (researchers, private companies, or governmental agencies), but the opportunity for a meeting should also be offered to single potential collaborators who are known to have collected highly relevant data.
- 2 Anyone who shared data should include or invite all collaborators involved in the individual projects as co-authors in publications (Gomes et al., 2022). Beyond the ethical issues, inviting and encouraging the participation of all contributors would facilitate the organization of data, promoting task sharing among them and speeding up the process.
- 3 Practitioners and researchers should be constantly clarified that data obtained during environmental licensing or funded by public agencies are open access. In Brazil, federal laws guarantee public access to environmental data from governmental processes (Brasil,

2011, 2003). Similarly, in other countries, there are policies mandating that research data and results from federally funded projects be made publicly available (e.g. U.S. Public Access to Research Results (Holdren, 2013) and the European Union's Horizon Europe (Innovation, 2021)).

- 4 The compilation team should create user-friendly spreadsheets to simplify the filling out process for collaborators. This would reduce incorrect data entries, which often create challenges for the compilation team during the data curation process. Moreover, lack of clarity in data request (as unclear formats or extensive requirements) has been ranked as the major obstacle to data sharing (Volk et al., 2014). Tutorials and training sessions (synchronous or asynchronous) may also minimize the incorrect filling of more complex spreadsheets. Also, individual projects should adopt the FAIR Data Principles (Findable, Accessible, Interoperable, Reusable) from their outset to enhance data quality and comprehensibility (Wilkinson et al., 2016). When individual projects maintain a standardized data organization pattern accompanied by clear metadata documentation, their data sets become inherently ready to be shared. This practice directly benefits data paper initiatives by significantly reducing the effort required by the compilation team to curate, standardize, and validate the received information.
- 5 The compilation team could also consider the possibility of submitting questionnaires to all invited collaborators. It would be a direct way to access information about the difficulties and reasons why people choose not to share data (Tenopir et al., 2011). Directly understanding the reasons for non-sharing would help the compilation team to develop more effective counteracting strategies to enhance the data sharing.
- 6 Funding institutions should support data paper projects to accelerate the availability of large data sets on strategic conservation themes. As discussed here, the data sharing and compilation processes are time-consuming, and funding a dedicated team would enable them to assist collaborators who might otherwise be unable to share their data. This would help them in adapting their data to the standard spreadsheets of the data paper.

The implementation of the recommendations outlined above can be accelerated by promoting a paradigmatic shift in biodiversity data management. Although biodiversity and socio-ecological systems are inherently relational, current data management practices remain largely reductionist, with datasets often designed for single disciplines or institutional interests. A key counteracting strategy is therefore to move from reductionist to relational approaches, potentially supported by the formal recognition, development, and promotion of a new form of intelligence—the Nature Quotient (Vuong and Nguyen, 2025).

Cultivating ecological intelligence across all stakeholders can foster the recognition of biodiversity data as a shared asset for human and non-human well-being, transcending institutional and sectoral silos (Vuong and Nguyen, 2025). Achieving this transition, however, requires systemic change rather than individual effort alone. In addition to researchers and practitioners, funders and policymakers must be actively involved. Encouraging this shift in thinking can reshape the core values of researchers, practitioners, and organizations, creating the motivational conditions needed for open and collaborative data sharing.

Conclusion

The process of sharing and compiling data faces significant barriers, which can influence the overall progress and the success of data paper collaborative initiatives. The barriers and strategies enumerated above were identified from the spontaneous exchange of messages with collaborators of our projects. They add to other previously documented contributions on data sharing challenges (Enke et al., 2012; Gomes et al., 2022), and more specifically, for the compilation of data papers. The speed of the biodiversity crisis urges for a more mutualistic partnership

between researchers and practitioners and a compelling way to promote it is through data sharing. One way to systemically motivate this is to recognize data as an asset for human and non-human well-being (Vuong and Nguyen, 2025). We hope this letter motivates broader collaboration—encouraging individuals and institutions to share or compile data—and greater investment in such initiatives.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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