The role of journals in supporting the socially responsible use of conservation technology

Chris Sandbrook, Martin Fisher, Graeme S. Cumming, Karl L. Evans Jenny Anne Glikman, Brendan J. Godley, Frith Jarrad, Nicholas Polunin Carolina Murcia, Angel Pérez-Ruzafa and Judit K. Szabo

Conservation and ecological research has been transformed by the emergence of digital technologies. Hardware such as camera traps, drones, miniaturized tracking devices and mobile phones, and the accompanying software and data infrastructure, have facilitated the collection of vast volumes of novel data. These are generating new insights that can be used for conservation management (e.g. Graham et al., 2012; Hahn et al., 2017; Hegerl et al., 2017), monitoring (e.g. Hu et al., 2020; Oliveira-da-Costa et al., 2020), surveying (e.g. Kaizer et al., 2022; Pereira et al., 2022) and detection of rare species (e.g. Arvind et al., 2022), contributing to law enforcement (e.g. Sintov et al., 2019), and providing novel opportunities for public engagement (e.g. Green, 2018).

Although the value of digital technology for conservation and ecological research is clear, there are potential risks and concerns (Adams, 2018). Most research on this topic addresses risks to biodiversity through direct disturbance (e.g. Duporge et al., 2021) or increased risk of being targeted for illegal wildlife trade (e.g. Lennox et al., 2020). A growing body of work is addressing impacts on people, either through targeted collection of data (e.g. on identity or movement) or through inadvertent collection of such data (Sandbrook et al., 2018). The various ways in which data on people can be collected as part of conservation and ecological research have been referred to as ecosurveillance (Young et al., 2022).

Ecosurveillance can be beneficial to people, for example where local residents are able to collect data that enable them to protect their lands and resources from the advances of extractive industries (e.g. Vargas-Ramírez & Paneque-Gálvez, 2019). However, there are multiple ways in which ecosurveillance can be harmful to people, including invasion of privacy, the creation of a landscape of fear (Simlai & Sandbrook, 2021), and the chilling effects that overt surveillance can have in constraining even legitimate, legal behaviours (Young et al., 2022). These social impacts matter because human rights and well-being are important, and because long-term conservation success often depends on positive relationships between conservationists and local residents.

To address these concerns, researchers have suggested ways to encourage socially responsible use of digital technology for conservation and ecological research. Sharma et al. (2020) proposed an ethical code of conduct for the use of camera traps, Sandbrook et al. (2021) proposed principles for the socially responsible use of conservation monitoring technology and data, Di Minin et al. (2021) addressed data privacy concerns when using social media data and Young et al. (2022) drew on insights from surveillance studies to encourage ethical ecosurveillance. These complementary articles offer guidance and frameworks for the users of digital technology. Based on extensive engagement with users of devices, they are intended to support and facilitate high-quality research rather than to act as unnecessary impediments to progress.

Guidelines and principles are of no value unless they are adopted by their target audience—in this case researchers and practitioners who use digital technology for conservation and ecology. There are several potential pathways to uptake. Users can voluntarily adopt principles, or can be compelled to adopt them by the requirements set by funders and ethical review boards or by government regulations and the publication policies of journals.

Journals play a crucial role as curators of the peer-reviewed literature, which for many researchers is essential for sharing results and advancing careers. As such, journals have a role in shaping the conduct of research by establishing guidelines regarding what they will and will not accept for publication. All journals contain some form of instructions for authors, and these typically include guidance on the ethical conduct of research. For example, conservation and ecology journals usually include guidance on minimizing ecological risks associated with research (such as through sample collection) and ensuring the ethical conduct of social research (such as through interviews). However,

Chris Sandbrook (orcid.org/0000-0002-9938-4934) Department of Geography, University of Cambridge, Cambridge, UK

Martin Fisher (orcid.org/0000-0001-5044-2585) Fauna & Flora International, Cambridge, UK

Graeme S. Cumming (orcid.org/0000-0002-3678-1326) Conservation Letters; Karl L. Evans (orcid.org/0000-0002-3492-8072) Animal Conservation; Jenny Anne Glikman (orcid.org/0000-0002-0208-5488) Human Dimensions of Wildlife; Brendan J. Godley (orcid.org/0000-0003-3845-0034) Endangered Species Research; Frith Jarrad (orcid.org/0000-0003-4081-1310) Conservation Biology; Carolina Murcia (orcid.org/0000-0003-1520-3014) Conservation Science & Practice; Angel Pérez-Ruzafa (orcid.org/0000-0003-4769-8912) Journal for Nature Conservation; Nicholas Polunin (orcid.org/0000-0002-1480-8794) Environmental Conservation; Judit K. Szabo (orcid.org/0000-0002-8786-1887) Avian Conservation and Ecology

Oryx, 2023, 57(1), 1–2 © The Author(s), 2023. Published by Cambridge University Press on behalf of Fauna & Flora International doi:10.1017/S0030605322001521

until now conservation and ecology journals have not tended to include specific guidance on the use of digital technologies and the potential social impacts of ecosurveillance. Given the importance of this issue and the influence of journals on the research community, this creates an opportunity for journals to play a leading role in driving change.

To address this issue, the Editor of *Oryx*, working with the authors of Sandbrook et al. (2021), developed a new guideline for the journal's instructions to authors:

> Where research involves the use of monitoring devices that could collect data on people (e.g. drones, camera traps, audio recorders or other devices), or the use of data on people's behaviour or opinions derived from social media or other technologies, steps should be taken to ensure that the research is conducted in a socially responsible manner that does not violate privacy or cause other unnecessary harm. This applies whether or not collecting data on people is a deliberate intention of the research. Researchers are encouraged to adopt existing guidelines as a framework for professional procedure, following Sandbrook et al. (2021), Sharma et al. (2020), Di Minin et al. (2021) and Young et al. (2022).

This guideline, or a version of it, has now been adopted by 10 leading conservation and ecology journals. As editors of these journals, we confirm our commitment to promoting the socially responsible use of conservation technology by rigorously applying the guideline. This does not mean we will not publish research that includes data about people collected using digital technologies; where recommendations on best practice have been followed such research can be both valuable for conservation and socially responsible. However, we commit to declining to publish work that does not demonstrate due consideration (and where appropriate, mitigation) of potential social concerns. Demonstrating this could take a number of different forms, as not all researchers have access to ethics committees.

Journals play an important role in the research process but have limited influence when acting in isolation. We call on other journals to adopt the guideline above. We also call on donors, ethical review boards, government regulators and other relevant bodies to take steps to incorporate the guideline into their own policies and procedures, and on instructors to incorporate the guideline into curricula. Finally, we call on researchers to embrace the importance of considering impacts on people through their work with conservation surveillance and other digital technologies, and how these could be mitigated. We hope that such actions will contribute to what we see as a general and ongoing shift in the culture of conservation research, towards a future in which social implications are considered, reviewed and mitigated as a matter of course.

References

Adams, W.M. (2018) Conservation by algorithm. *Oryx*, 52, 1–2.

Arvind, C., Joshi, V., Charif, R., Jeganathan, P. & Robin, V.V. (2022) Species detection framework using automated recording units: a case study of the Critically Endangered Jerdon's courser. *Oryx*, 57, 55–62.

Di Minin, E., Fink, C., Hausmann, A., Kremer, J. & Kulkarni, R. (2021) How to address data privacy concerns when using social media data in conservation science. *Conservation Biology*, 35, 437–446.

Duporge, I., Spiegel, M.P., Thomson, E.R., Chapman, T., Lamberth, C., Pond, C. et al. (2021) Determination of optimal flight altitude to minimise acoustic drone disturbance to wildlife using species audiograms. *Methods in Ecology and Evolution*, 12, 2196–2207.

Graham, M.D., Adams, W.M. & Kahiro, G.N. (2012) Mobile phone communication in effective human elephant–conflict management in Laikipia County, Kenya. *Oryx*, 46, 137–144.

Green, M. (2018) Gone Cuckoo. *Biodiversity*, 19, 216–218.

Hahn, N., Mwakatobe, A., Konuche, J., Souza, N. de, Keyyu, J., Goss, M. et al. (2017) Unmanned aerial vehicles mitigate human–elephant conflict on the borders of Tanzanian parks: a case study. *Oryx*, 51, 513–516.

Hegerl, C., Burgess, N.D., Nielsen, M.R., Martin, E., Ciolli, M. & Rovero, F. (2017) Using camera trap data to assess the impact of bushmeat hunting on forest mammals in Tanzania. *Oryx*, 51, 87–97.

Hu, J., Wu, X. & Dai, M. (2020) Estimating the population size of migrating Tibetan antelopes *Pantholops hodgsonii* with unmanned aerial vehicles. *Oryx*, 54, 101–109.

Kaizer, M.C., Alvim, T.H.G., Novaes, C.L., McDevitt, A.D. & Young, R.J. (2022) Snapshot of the Atlantic Forest canopy: surveying arboreal mammals in a biodiversity hotspot. *Oryx*, 56, 825–836.

Lennox, R.J., Harcourt, R., Bennett, J.R., Davies, A., Ford, A.T., Frey, R.M. et al. (2020) A novel framework to protect animal data in a world of ecosurveillance. *BioScience*, 70, 468–476.

Oliveira-da-Costa, M., Marmontel, M., da-Rosa, D.S.X., Coelho, A., Wich, S.A., Mosquera-Guerra, F. & Trujillo, F. (2020) Effectiveness of unmanned aerial vehicles to detect Amazon dolphins. *Oryx*, 54, 696–698.

Pereira, J.A., Varela, D., Scarpa, L.J., Frutos, A.E., Fracassi, N.G., Lartigau, B.V. & Piña, C.I. (2022) Unmanned aerial vehicle surveys reveal unexpectedly high density of a threatened deer in a plantation forestry landscape. *Oryx*, 57, 89–97.

Sandbrook, C., Clark, D., Toivonen, T., Simlai, T., O'Donnell, S., Cobbe, J. & Adams, W.M. (2021) Principles for the socially responsible use of conservation monitoring technology and data. *Conservation Science and Practice*, 3, e374.

Sandbrook, C., Luque-Lora, R. & Adams, W.M. (2018) Human bycatch: conservation surveillance and the social implications of camera traps. *Conservation and Society*, 16, 493–504.

Sharma, K., Fiechter, M., George, T., Young, J., Alexander, J.S., Bijoor, A. et al. (2020) Conservation and people: towards an ethical code of conduct for the use of camera traps in wildlife research. *Ecological Solutions and Evidence*, 1, e12033.

Simlai, T. & Sandbrook, C. (2021) Digital surveillance technologies in conservation and their social implications. In *Conservation Technology* (eds S.A. Wich & A.K. Piel), pp. 241–253. Oxford University Press, Oxford, UK.

Sintov, N., Seyranian, V. & Lyet, A. (2019) Fostering adoption of conservation technologies: a case study with wildlife law enforcement rangers. *Oryx*, 53, 479–483.

Vargas-Ramírez, N. & Paneque-Gálvez, J. (2019) The global emergence of community drones (2012–2017). *Drones*, 3, 76.

Young, N., Roche, D.G., Lennox, R.J., Bennett, J.R. & Cooke, S.J. (2022) Ethical ecosurveillance: mitigating the potential impacts on humans of widespread environmental monitoring. *People and Nature*, 4, 830–840.