







## PERSPECTIVE

# Avoiding parachute science when addressing conflict over wildlife

Kirstie A. Ruppert<sup>1</sup>  | Laiyon Lenguya<sup>2</sup>  | Ambrose Letoluai<sup>3</sup>  |  
Isaac Limo<sup>4</sup> | Megan A. Owen<sup>1</sup>  | Nicholas W. Pilfold<sup>1</sup>  | Paul Wachira<sup>5</sup> |  
Jenny A. Glikman<sup>1,6</sup> 

<sup>1</sup>Conservation Science & Wildlife Health,  
San Diego Zoo Wildlife Alliance,  
Escondido, California, USA

<sup>2</sup>University of Nairobi, Nairobi, Kenya

<sup>3</sup>Africa Nazarene University, Nanyuki,  
Kenya

<sup>4</sup>Wildlife Research and Training Institute,  
Naivasha, Kenya

<sup>5</sup>Loisaba Conservancy, Laikipia, Kenya

<sup>6</sup>Instituto de Estudios Sociales Avanzados  
(IESA-CSIC), Córdoba, Spain

## Correspondence

Kirstie A. Ruppert, San Diego Zoo  
Wildlife Alliance, 15600 San Pasqual  
Valley Rd., Escondido, CA 92027, USA.  
Email: kruppert@sdzwa.org

## Abstract

As a solutions-oriented discipline, our attention is often placed on the substance of conservation challenges. Ideally, conservation science is relevant for policy and practice, contributing relevant data to fill key knowledge gaps. Thus, the data value is not only determined by methodological rigor, but also by its usefulness. In this perspective, we contend that trust in the purpose and process of data collection is integral to evidence-based conservation and threatened by parachute science. We describe the substance, process, and relationships involved in the establishment of a community-based reporting network for evaluating conflict responses and interventions to wildlife damage. We demonstrate how reflection on the process of science can provide the foundation for meaningful collaboration. We illustrate how, as a multinational team, supporting local researchers to establish a community-based program, trust and demonstration of a long-term commitment are essential to avoid the pitfalls of parachute science.

## KEYWORDS

conservation conflict, human–wildlife conflict, parachute science, research–implementation gap

## 1 | INTRODUCTION

Conservation science is a solutions-oriented discipline, generating knowledge to inform and shape the policies and practices that protect global biodiversity (Williams, Balmford, & Wilcove, 2020). There are, however, noted barriers to the integration of knowledge into conservation (Dubois, Gomez, Carlson, & Russell, 2020). Failures to integrate evidence into conservation are not only due to a lack of data but also insufficient consideration of *how* and *by whom* knowledge is generated (Toomey, Knight, &

Barlow, 2017). Such shortfalls have often been driven by international scientists, most frequently from countries in the Global North, who fail to engage with, recognize, and/or value the local and national capacity required for meaningful conservation. This practice has been called *parachute science* (de Vos, 2020; Stefanoudis et al., 2021).

An important way to address parachute science is to structure collaborative conservation to engage a diverse set of actors during multiple stages of the research process. In a review of human–carnivore conflict research and knowledge integration, Gray et al. (2020) found that

This is an open access article under the terms of the Creative Commons Attribution License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited.

© 2021 The Authors. *Conservation Science and Practice* published by Wiley Periodicals LLC on behalf of Society for Conservation Biology.

few studies involved local communities in the research process beyond passive data collection as research subjects. It is important to recognize power dynamics and differentials in places with legacies of parachute science. Foreign researchers may be unaware, underestimate, or take advantage of the power they hold while planning for and conducting science (Kristjanson et al., 2009). In their development of an engagement model for knowledge integration, Reid et al. (2016) found that power imbalances were neutralized when community members and scientists worked together through the scientific process, including the development of research focus, data collection, and the interpretation of findings.

In this article, we describe and reflect on our experience with such a process, working as a multinational team to conduct applied research with local communities, as host country and foreign researchers. We work together within the context of a leopard conservation program to understand and address human–wildlife conflicts in northern Kenya. Our program is situated in Laikipia County, Kenya, based at Loisaba Conservancy (hereafter Loisaba) and Mpala Research Center, and implemented with community partners in adjacent community conservancies. Our team formed as part of a partnership between Loisaba, where our Kenyan team are employees of the Wildlife and Community Departments, and San Diego Zoo Wildlife Alliance, a U.S.-based nonprofit

organization, where our foreign team was employed for this work. Our individual roles are outlined in Table 1, using the contributor roles taxonomy outlined in Cooke et al. (2021).

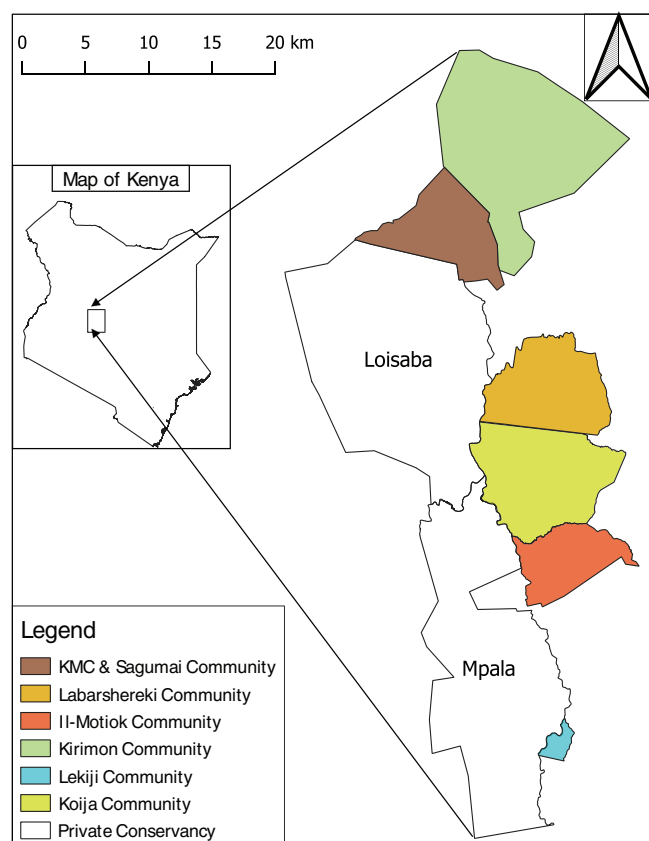
Loisaba is a 230-km<sup>2</sup> private wildlife reserve and working ranch owned by the Loisaba Community Trust. Loisaba is neighbored by Mpala Research Center to the south and pastoralist group ranches and communities to the north and east. The communities with whom we partner are established in community conservancies and group ranches in Sagumai, KMC, Kirimon, Labarshereki, Koiya, Il-Motiok, and Lekiji (Figure 1). The primary ethnic groups in these areas are Samburu and Maasai, and the primary livelihood is pastoralism (Unks, King, German, Wachira, & Nelson, 2019). Turkana and Borana people also live in Lekiji.

One objective codeveloped with partner communities centered on improving coexistence with leopards. Risk from livestock depredation by leopards was identified as a high relative concern through a baseline human dimensions survey we conducted with these communities in 2017. Historical data of human–carnivore interactions within the communities bordering Loisaba Conservancy is limited or incomplete across the engaged communities. Consistent and reliable data collection across these communities could uncover factors that expose and limit vulnerabilities to livestock depredation. We needed a system

**TABLE 1** Outline of individual team members' roles in program

Author	Country of affiliation	Roles
KR	United States	Conceptualization, methodology, formal analysis, supervision, project administration, funding acquisition, co-production, partnership development and consultation, securing permissions and permits, and training
LL	Kenya	Conceptualization, methodology, formal analysis, investigation, data curation, supervision, project administration, co-production, partnership development and consultation, securing permissions and permits, project sunset, training, bridging and brokering
AL	Kenya	Conceptualization, methodology, investigation, data curation, supervision, funding acquisition, co-production, partnership development and consultation, project sunset, training, bridging and brokering
IL	Kenya	Methodology, investigation, data curation, co-production, partnership development and consultation, project sunset, bridging and brokering
MO	United States	Conceptualization, methodology, supervision, project administration, funding acquisition, partnership development and consultation, bridging and brokering
NP	United States	Conceptualization, methodology, formal analysis, resources, data curation, supervision, project administration, funding acquisition, co-production, partnership development and consultation, securing permissions and permits, project sunset, team building, and training
PW	Kenya	Validation, resources, partnership development and consultation, bridging and brokering
JG	United States	Conceptualization, methodology, supervision, funding acquisition, securing permissions, and permits

Abbreviations: AL, Ambrose Letoluai; IL, Isaac Limo; JG, Jenny A. Glikman; KR, Kirstie A. Ruppert; LL, Laiyon Lenguya; MO, Megan A. Owen; NP, Nicholas W. Pilfold; PW, Paul Wachira.



**FIGURE 1** Program areas in northern Kenya

for data collection, as well as high levels of community participation, for our program to help fill a data deficiency in the region and drive strategies that address livestock depredation.

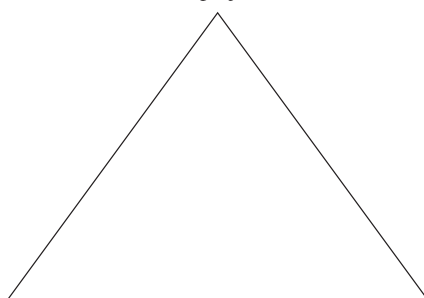
We established a Conflict Reporting Network (CRN) with 20 community representatives to estimate rates of conflict events and to monitor livestock depredation over time. Community leadership selected a representative for each area, and livestock owners were asked to immediately call their representative after a depredation event involving large carnivores. Representatives report to the incident site, listen to livestock owners, and systematically record data from the owner and, when available, a witness, regarding the event by using a tablet and standardized form. In some community areas, representatives needed replacement due to underperformance or inability to efficiently report calls. In those cases, one of our Kenyan researchers (AL, LL, and/or IL) discussed the circumstances with community leadership and found a replacement. Beyond initial training with the representatives at the onset of the CRN, the Kenyan leopard team maintained consistent communication with representatives and community leadership to ensure continued operation of the CRN and to encourage maximum participation by community members.

To examine our lessons learned, we use the Conflict Intervention Triangle—substance, process, and relationships—conceptual framework (Madden & McQuinn, 2014, 2017; Figure 2). These three dimensions are not only relevant to our case of conflicts related to leopards and livestock damages, but also highly applicable to understanding how multinational research collaborations can be damaged by parachute science. To ensure deeply rooted drivers of conflict are addressed, we believe that all three dimensions should be addressed simultaneously with balanced attention (Iwane, Leong, Vaughan, & Oleson, 2021).

Substance is most often emphasized in conventional conservation practice, as it pertains to the diagnosing and describing of a presenting conservation issue. We conversed with community members about the purpose of our data collection, setting expectations for what could be understood from our collective efforts to record data on leopard–livestock interactions. We also stressed that consistent data collection will help us to understand the system, but data alone would not reduce negative human–leopard interactions. Instead, we conveyed a commitment to regularly share research updates and findings, so that livestock owners could use generated evidence for husbandry decisions. We emphasized that our project's end point was not a completed data set, but instead, our intentions were to conduct research of practical relevance (Rafidimanantsoa, Poudyal, Ramamonjisoa, & Jones, 2018) and to communicate findings to livestock owners as the primary users of research findings. Initial data collected by the CRN suggest higher levels of depredation following the wet seasons and more incidences involving goats and sheep overnight at bomas than during daytime herding. CRN data were used by community leaders to determine areas and livestock bomas to involve in a conflict intervention with installations of wire-walled bomas and predator deterrent lights.

The likelihood of livestock owners to use findings heavily depends on the “process” dimension of the Conflict Intervention Triangle. A trusted process not only generates agreement about conservation strategies, but also increases ownership over decisions (Madden & McQuinn, 2017). To build trust in our process, we were transparent when adjustments to the CRN and research methods were needed, and involved community leadership in decisions to move forward, a practice also supported by the findings of Sterling et al. (2017) on stakeholder engagement processes. Trust involves fairness of stakeholder engagement processes (Young et al., 2016), and trust in the legitimacy of data is significantly tied to credibility of research findings (Cook, Mascia, Schwartz, Possingham, & Fuller, 2013). Trust can be more challenging to build than to erode (Slovic, 1993), and in places with legacies of parachute science, collaborative research teams may be working from a baseline of distrust. Regular communication between our Kenyan team

**Substance:** Description and presentation of conservation issue; e.g., discuss and set expectations with community members about the purpose of project



**Process:** “Decision-making design, equity and authority, and how (and by whom) these are exercised” (Madden & McQuinn, 2014, p. 102); e.g., transparency and involvement of community in decisions; legitimacy of data and credibility of research findings

**Relationships:** Interpersonal relationships between individual actors/stakeholder groups, grounded in trust and respect; e.g., regular, monthly meetings, communications to build trust

**FIGURE 2** Adaptation of the Conflict Intervention Triangle (Madden & McQuinn, 2014) as the conceptual framework to describe lessons learned

(LL, AL, IL, and PW), representatives, and livestock owners has supported buy-in to our research collaboration process. Consideration of language is an important aspect of the process when working with community members on conservation planning (Montgomery, Borona, Kasozi, Mudumba, & Ogada, 2020). When our foreign researchers (JG, MO, NP, and KR) are in Kenya, we participate in meetings within each community area and at an annual stakeholder gathering. The local Maa language is primarily used during these research meetings, and one of our Kenyan researchers translate any contributions from the foreign team, so they are delivered in the local language and framed according to context.

As the third dimension of the Conflict Intervention Triangle, relationships provide the core foundation of who is involved in collaborative science. A major pitfall of parachute science is the failure to build and value interpersonal relationships, by foreign scientists assuming knowledge of a conservation problem and prescribing solutions, rather than actively listening and co-generating solutions with local actors. Those involved fail to recognize and value the local capacity and expertise critical to scientific activities. We acknowledge our ability to pursue scientific and conservation objectives depends on our relationships with the CRN as well as their relationships with community members and livestock owners. We believe that enhancing representatives' capacity to respond to instances of carnivore conflicts allows the CRN to be more sustainable over the longer term and positively feeds back to levels of trust in our process and credibility of data. Furthermore, training the community representatives and maintaining the relationships that underpin the CRN have provided opportunities for our Kenyan team to demonstrate their leadership.

The relationships fostered through the CRN and other program research activities have aided the development of additional conservation initiatives in the area, including a women's conservation group cofounded by AL (Vorster, 2021). As our program moves forward, we believe that community relationships and engagement with local leadership will similarly support the buy-in and capacity required for implementing interventions to reduce conflict over carnivores.

The Conflict Intervention Triangle framework helps describe our lessons from developing the CRN and conducting collaborative science, but our positionality within communities and within our team spans all three dimensions. Building trust and setting expectations with partner communities were led by the skill and time investment of our Kenyan team. We understand that our foreign team is perceived by community members as involved in the science, but primarily as responsible for funding acquisition. This is important to acknowledge, as parachute science is often perpetuated by foreign funding that drives research priorities. In Kenya, there is a disproportionate influence of international actors in the conservation sphere. This disparity is presented by Cockerill and Hagerman (2020) in their historical analysis of legacies from British colonial wildlife policy and colonial worldviews that shape modern conservation. A paradigm shift toward authentic community-based conservation requires devolution of power from state agencies, nongovernmental organizations, and donors (Reid, 2012). Our foreign team intends for our contribution to be part of such a shift that aligns conservation resources with local priorities. A goal of our program is to transition roles related to funding acquisition and lead authorship of scientific outputs to our Kenyan team members. Members

of the Kenyan team are currently enrolled in (AL and IL) or completing (LL) additional degrees, and recent funding has been acquired through grants in which AL is the principal investigator. Disrupting patterns of parachute science requires recognition of the power structures that enable its practice, including the influence of actors outside the communities where conservation is situated. We developed our conservation program to align with community needs and priorities, shown through our example of the CRN. Moving forward, our program will be strengthened and furthered by our Kenyan team as lead investigators.

Multinational research teams need to thoughtfully engage with local communities, moving conservation science forward to recognize the purpose (i.e., substance), process, and relationships that underpin collaborative science. While engaging in international research, foreign researchers should pursue cooperative learning to avoid the pitfalls associated with parachuting in as experts (Chua et al., 2020). We present our approach from a case of carnivore conservation, though we believe the framework is relevant to other systems. Emphasis on the people involved and the process of data collection can support the integration of research findings into practice, while highlighting the value of local capacity and knowledge for conservation efforts to be carried out.

## ACKNOWLEDGMENTS

We would like to thank project partners, including Loisaba Conservancy, Kenya Wildlife Service, Northern Rangelands Trust, The Nature Conservancy, Mpala Research Center, and community leadership and participants in Naibunga, Nannapa, and Kirimon Community Conservancies and KMC, Sagumai, and Lekiji group ranches. We are grateful to the following individuals for their contributions as CRN community representatives: Simon Lemorogo, Lemorias Lemeteki, Caroline Naimado, Francis Lemeteki, Nkitemu Lentoimaga, Risino Evelyn Yiangere, Lelekung Makrendi, Kelly Naiputari, Jane Lenkirikai Ntipiwa, Leere Benson, Ltarasi Lenduda, Tereson Lenduda, Paulo Laisikie, Josphine Naimado, Philemon Lekartiwa, Samuel Leerete, Saire Lekermui, Benson Meitiaki, Grace Meitiaki, Isaac Limo, Rukia Hassan, John Muriuki, Amos Ltudungwa, Alfred Manyas, Maria Lenduda, and Rumuni Lemooge. We also thank Lexson Larpei for his support of Uhifadhi Wa Chui during community meetings.

## CONFLICT OF INTEREST

The authors declare no conflict of interest.

## AUTHOR CONTRIBUTIONS

**Kirstie A. Ruppert:** Conceived of the paper, led the writing. **Jenny A. Glikman:** Conceived of the paper, adapted Figure 2. **Laiyon Lenguya:** Developed Figure 1.

Contributions to the program are outlined in Table 1. All authors reviewed, assisted with editing, and approved the final version to be published.

## DATA AVAILABILITY STATEMENT

Data analyses are not presented in this article.


## ETHICS STATEMENT

Research protocols were reviewed and approved by Kenya Wildlife Service and the National Commission for Science, Technology, and Innovation. Human subjects data collection protocols were approved by the Miami University Institutional Review Board.


## ORCID

Kirstie A. Ruppert  <https://orcid.org/0000-0002-6263-7600>

Laiyon Lenguya  <https://orcid.org/0000-0001-5130-0677>

Ambrose Letoluai  <https://orcid.org/0000-0002-4490-6053>

Megan A. Owen  <https://orcid.org/0000-0003-1655-3972>

Nicholas W. Pilfold  <https://orcid.org/0000-0001-5324-5499>

Jenny A. Glikman  <https://orcid.org/0000-0002-0208-5488>

## REFERENCES

- Chua, L., Harrison, M. E., Fair, H., Milne, S., Palmer, A., Rubis, J., ... Meijaard, E. (2020). Conservation and the social sciences: Beyond critique and co-optation. A case study from orangutan conservation. *People and Nature*, 2(1), 42–60. <https://doi.org/10.1002/pan3.10072>
- Cockerill, K., & Hagerman, S. (2020). Historical insights for understanding the emergence of community-based conservation in Kenya: International agendas, colonial legacies, and contested worldviews. *Ecology and Society*, 25(2), 1–19. <https://doi.org/10.5751/ES-11409-250215>
- Cook, C. N., Mascia, M. B., Schwartz, M. W., Possingham, H. P., & Fuller, R. A. (2013). Achieving conservation science that bridges the knowledge–action boundary. *Conservation Biology*, 27(4), 669–678. <https://doi.org/10.1111/cobi.12050>
- Cooke, S. J., Nguyen, V. M., Young, N., Reid, A. J., Roche, D. G., Bennett, N. J., ... Bennett, J. R. (2021). Contemporary authorship guidelines fail to recognize diverse contributions in conservation science research. *Ecological Solutions and Evidence*, 2(2), 1–7. <https://doi.org/10.1002/2688-8319.12060>
- de Vos, A. (2020, July 1). The Problem of “Colonial Science.” *Scientific American*. Retrieved from. <https://www.scientificamerican.com/article/the-problem-of-colonial-science/>
- Dubois, N. S., Gomez, A., Carlson, S., & Russell, D. (2020). Bridging the research–implementation gap requires engagement from practitioners. *Conservation Science and Practice*, 2(1), e134. <https://doi.org/10.1111/csp2.134>
- Gray, S. M., Booher, C. R., Elliott, K. C., Kramer, D. B., Waller, J. C., Millspaugh, J. J., ... Montgomery, R. A. (2020). Research–implementation gap limits the actionability of



- human-carnivore conflict studies in East Africa. *Animal Conservation*, 23(1), 7–17. <https://doi.org/10.1111/acv.12520>
- Iwane, M. A., Leong, K. M., Vaughan, M., & Oleson, K. L. L. (2021). When a shark is more than a shark: A sociopolitical problem-solving approach to fisher-shark interactions. *Frontiers in Conservation Science*, 2, 669105. <https://doi.org/10.3389/fcsc.2021.669105>
- Kristjansson, P., Reid, R. S., Dickson, N., Clark, W. C., Romney, D., Puskur, R., ... Grace, D. (2009). Linking international agricultural research knowledge with action for sustainable development. *Proceedings of the National Academy of Sciences*, 106(13), 5047–5052.
- Madden, F., & McQuinn, B. (2014). Conservation's blind spot: The case for conflict transformation in wildlife conservation. *Biological Conservation*, 178, 97–106. <https://doi.org/10.1016/j.biocon.2014.07.015>
- Madden, F., & McQuinn, B. (2017). Conservation conflict transformation: Addressing the missing link in wildlife conservation. In *Understanding conflicts about wildlife: A biosocial approach*. New York, NY: Berghah Books.
- Montgomery, R. A., Borona, K., Kasozi, H., Mudumba, T., & Ogada, M. (2020). Positioning human heritage at the center of conservation practice. *Conservation Biology*, 34(5), 1122–1130. <https://doi.org/10.1111/cobi.13483>
- Rafidimanantsoa, H. P., Poudyal, M., Ramamonjisoa, B. S., & Jones, J. P. G. (2018). Mind the gap: The use of research in protected area management in Madagascar. *Madagascar Conservation & Development*, 13(1), 15–24. <https://doi.org/10.4314/mcd.v13i1>
- Reid, R. (2012). Savannas of our future. In *Savannas of our birth: People, wildlife, and change in East Africa* (pp. 238–266). Berkeley, CA: University of California Press.
- Reid, R. S., Nkedianye, D., Said, M. Y., Kaelo, D., Neselle, M., Makui, O., ... Clark, W. C. (2016). Evolution of models to support community and policy action with science: Balancing pastoral livelihoods and wildlife conservation in savannas of East Africa. *Proceedings of the National Academy of Sciences*, 113(17), 4579–4584. <https://doi.org/10.1073/pnas.0900313106>
- Slovic, P. (1993). Perceived risk, trust, and democracy. *Risk Analysis*, 13(6), 675–682.
- Stefanoudis, P. V., Licuanan, W. Y., Morrison, T. H., Talma, S., Veitayaki, J., & Woodall, L. C. (2021). Turning the tide of parachute science. *Current Biology*, 31(4), R184–R185. <https://doi.org/10.1016/j.cub.2021.01.029>
- Sterling, E. J., Betley, E., Sigouin, A., Gomez, A., Toomey, A., Cullman, G., ... Porzecanski, A. L. (2017). Assessing the evidence for stakeholder engagement in biodiversity conservation. *Biological Conservation*, 209, 159–171. <https://doi.org/10.1016/j.biocon.2017.02.008>
- Toomey, A. H., Knight, A. T., & Barlow, J. (2017). Navigating the space between research and implementation in conservation. *Conservation Letters*, 10(5), 619–625. <https://doi.org/10.1111/conl.12315>
- Unks, R. R., King, E. G., German, L. A., Wachira, N. P., & Nelson, D. R. (2019). Unevenness in scale mismatches: Institutional change, pastoralist livelihoods, and herding ecology in Laikipia, Kenya. *Geoforum*, 99, 74–87. <https://doi.org/10.1016/j.geoforum.2018.12.010>
- Vorster, J. (2021, June 4). The chui mamas of koija. Paula Kahumbu/Wildlife Direct. <https://wildlifedirect.org/the-chui-mamas-of-koija/>
- Williams, D. R., Balmford, A., & Wilcove, D. S. (2020). The past and future role of conservation science in saving biodiversity. *Conservation Letters*, 13(4), e12720. <https://doi.org/10.1111/conl.12720>
- Young, J. C., Searle, K., Butler, A., Simmons, P., Watt, A. D., & Jordan, A. (2016). The role of trust in the resolution of conservation conflicts. *Biological Conservation*, 195, 196–202. <https://doi.org/10.1016/j.biocon.2015.12.030>

**How to cite this article:** Ruppert, K. A., Lenguya, L., Letoluai, A., Limo, I., Owen, M. A., Pilfold, N. W., Wachira, P., & Glikman, J. A. (2021). Avoiding parachute science when addressing conflict over wildlife. *Conservation Science and Practice*, e548. <https://doi.org/10.1111/csp2.548>