

Now is the time for academics to think and act beyond academia

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Abstract

Despite the challenges posed by climate change and the biodiversity crisis, most academic research continues to stay within academia and the gaps between conservation science, policy, and practice remain intact. We need to improve the exchange of evidence between researchers and conservation practitioners and focus on solutions-oriented, interdisciplinary science and co-developed research. As we continue to break climate records and lose record numbers of species every year, now is the time for academics to think and act beyond their institutions.

Like many scientists, my work until recently was motivated solely by the production of scientific knowledge. I always sought to meet the challenges presented by issues like climate change and habitat loss. I remained steadfast in my commitment to producing good science, naively assuming my work would contribute to solving the environmental problems that face our society. However, I have had three realizations recently that have made me rethink how I approach the work we do in my lab and that serve as a wake-up call: we, as academics, have a responsibility to make sure that our science leaves our research institutions.

I share this as a settler who was mostly trained in Canada and now has tenure at a major university in Canada. Many great scientists have had the same realizations and made similar calls before me (e.g., [Chapron and Arlettaz 2008](#); [Bradshaw et al. 2021](#)). Despite these appeals, there is still much progress to make. We have yet to move the needle on the climate and biodiversity crises. My hope is to reach those who are in a similar position and those contemplating whether to speak out.

My first realization was that a lot of the great research we do stays within academia. Researchers are trained to view journal publication as the goal of their work. Institutions make hiring decisions in part based on how often a researcher is published. New research dollars stream in when past work is recognized within the scientific community. The result? Knowledge of world-changing research stays within the walls of the “ivory tower”. The failure of the scientific community to focus on public communication has a gate-keeping effect. Research gets discussed at conferences instead of family dinner tables. It remains behind the paywalls of niche journals instead of on the front page of well-circulated newspapers. This effect is even more critical in the age of disinformation. Scientists are missing their opportunity to have their work directly reach the public.

My second realization is that the role of evidence in informing conservation decision-making is not as straightforward as we might want it to be. There is increasing evidence that decision-makers rely heavily on personal experience, anecdotes, and personal contacts with colleagues and experts—without clear links to evidence ([Salafsky et al. 2019](#); [Kadykalo et al. 2021](#)). For example, information produced by staff within Canada’s protected area organizations was found to be given priority over other forms of empirical evidence in decision-making ([Lemieux et al. 2018](#)).

There are a lot of reasons why this would be the case. Conservation practitioners are highly diverse. They range from individual landowners to industrial employees to government managers. They have widely varying needs and skill sets. They are highly constrained by funding and especially by time. The most common barrier was recently found to be the accessibility of the evidence ([Kadykalo et al. 2021](#)). In other words, even when evidence existed, it was often not in a form suitable for use by practitioners ([Kadykalo et al. 2021](#)). We need to improve the exchange of evidence between researchers and conservation practitioners through actions like engaged scholarship of academics, co-produced research, and transdisciplinarity.¹ The gap between theory and practice remains surprisingly wide in conservation science (i.e., [The great divide 2007](#)).

My third realization was that solution-based conservation research is under-represented in the literature. Global biodiversity losses continue despite tremendous growth in the volume of conservation science over recent decades ([Williams et al. 2020](#)). Out of a random selection of 561 conservation-based

¹ Transdisciplinarity describes research efforts conducted by investigators from different disciplines working jointly to create new innovations that integrate and move beyond discipline-specific approaches to address a common problem ([Keeler and Locke 2022](#)).

papers published over the past four decades, [Fonseca et al. \(2021\)](#) found that only a quarter of the papers were classified as solution-based; those designed to propose, evaluate, and implement solutions to these environmental problems. Instead, much of this literature has been about understanding the main anthropogenic drivers associated with biodiversity loss and decline. We need to do better.

Why do we need to expand our impact?

Because society needs science. As Jane Lubchenco aptly said “science is more than just fascinating knowledge. It is also useful knowledge.” ([Baron 2010](#)). For the knowledge we generate to be useful, we need to make sure it lands in the hands of the people that need it. We also need to make sure that “science’s new contract with society” ([Lubchenco 1998](#)) moves away from its darker roles in colonization and ableism ([Branch et al. 2022](#)) and that we balance conservation for the preservation of “nature for itself” with conservation for “people and nature” ([Mace 2014](#)). Finally, good decisions require accurate and adequate information. If people are not informed, they cannot be engaged citizens (i.e., lead our leaders through their engagement and participation in the electoral process).

Because no one else is going to stand up for science. In fact, many groups are trying to dismiss and discount science. Consider the climate change deniers, the outspoken anti-vaxx movement, or the age of disinformation. If researchers with appropriate expertise are not willing to go the extra mile and speak up for science, there are plenty of mercenaries that will. To those who fear they will lose credibility, science needs help from scientists to find its proper place in society. Scientists have a deep knowledge, meaning you are not simply voicing an opinion; you are speaking from intensive and focused research. Promotion of accessible scientific research and humanizing scientists and science are the antidote to disinformation.

Because we are at a pivotal moment in the biodiversity crisis and climate change. “Crisis” means that the consequences of non-action are often worse than the consequences of action taken now based on incomplete information. Consider that the first session of the IPCC was held 35 years ago. Although the science was far more uncertain in the 1980’s, imagine if we had acted then regardless of the uncertainty. Quoting [Lubchenco \(2017\)](#) “now is the time for ecologists and environmental scientists to take a quantum leap into relevance”. Conservation science can learn from society’s impressive response to COVID-19, one that involved a rapid, solutions-oriented shift in medical science ([Buxton et al. 2020](#)).

Moving forward: how do we increase our impact?

As individual academics, we can strengthen our science communication to improve the accessibility of our work. For better or worse, journalists still represent a direct conduit to other audiences like decision-makers and the public. Thankfully, science communication work is increasingly being rec-

ognized as important. We can engage with stakeholders from the beginning of the scientific process to find out whether the gaps we have identified in the literature align with their priorities. Junior scholars in academic labs with a different focus can work to make science more accessible to the masses, improve the presence of science in the media, and engage with policy through advocacy (e.g., <https://www.supportourscience.ca>). The protest in 2012 by Canadian scientists to advocate for the role of science in decision-making is a great example of galvanizing scientists to get more involved (evidencefordemocracy.ca).

We need to redefine how we think of our impact. Most of us in academia were trained to think that impact means publishing in high-profile journals and publishing in large quantity. We need to think beyond the collection of data and publications and think about the “so what?”. We need to think about outcomes, not just outputs. The first calls to think about our broader impacts were already 15 years ago ([Chapron and Arlettaz 2008](#)). There is increasing discussion on developing quantitative metrics that can evaluate this broader definition of impact ([Keeler and Locke 2022](#); [Woolston 2023](#)). For example, Research Impact Canada is dedicated to helping universities and other organizations across Canada maximize the impact of research. There has also been work on what other metrics of “merit” might look like for applied environmental research such as whether published papers are cited in impact assessments or other regulatory decision documents ([Cooke et al. 2020](#)).

These complex issues require us to focus more on solutions and interdisciplinary thinking. Scientists are great at identifying problems, but the rest of the world is interested in solutions. Policy makers need actionable information for decisions that must be made now.

A more positive agenda is likely to improve our influence beyond academia. People are motivated by hope, not fear. Individuals with an optimistic outlook are more likely to accept the reality of challenging situations and take actions to meet their goals ([Cvitanovic and Hobday 2018](#)).

Finally, academic institutions can do their part, e.g., by reimagining academic structures to encourage interdisciplinary collaborations and innovation (e.g., joining applied and basic departments); creating research and extension programs (e.g., caes.ucdavis.edu/outreach/ce); defining service more broadly and investing more in the promotion of research; and making engaged research key criteria in hiring, promotion, tenure, and resource distribution decisions ([Keeler et al. 2017](#); [Keeler and Locke 2022](#)). We need academic institutions to have “skin in the game”.² With increased support from their institutions, academics will be more likely to explore how they can have a broader impact.

With new ambitious targets from the recent Convention on Biological Diversity’s Convention of the Parties (COP15; Kunming Montreal Global Biodiversity Framework; cbd.int/gbf),

² “Skin in the game” is a willingness to accept one’s own risks, paying a penalty if something goes wrong. (Taleb, N.N (2018) *Skin in the Game: Hidden Asymmetries in Daily Life*. Random House, United States, 304 pp.)

we have a great opportunity to step out of our tower and help ensure that the science we do helps to inform how society moves forward to meet these targets.

Acknowledgements

I thank R. Buxton, J. Ray, and an anonymous reviewer for their helpful feedback on this manuscript, as well as thought-provoking discussions with E. Feairs.

Article information

Editor

Yann Joly

History dates

Received: 28 April 2023

Accepted: 25 October 2023

Version of record online: 21 March 2024

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Data availability

This manuscript does not report data.

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Conceptualization: HMK

Writing – original draft: HMK

Writing – review & editing: HMK

Competing interests

The author declares there are no competing interests.

References

- Baron, N. 2010. *Escape from the ivory tower: a guide to making your science matter*. Island Press.
- Bradshaw, C.J., Ehrlich, P.R., Beattie, A., Ceballos, G., Crist, E., Diamond, J., and Blumstein, D.T. 2021. Underestimating the challenges of

- avoiding a ghastly future. *Frontiers in Conservation Science*, 1:9. doi:[10.3389/fcsc.2020.615419](#).
- Branch, H.A., Klingler, A.N., Byers, K.J., Panofsky, A., and Peers, D. 2022. Discussions of the “not so fit”: how ableism limits diverse thought and investigative potential in evolutionary biology. *The American Naturalist*, 200(1): 101–113. doi:[10.1086/720003](#). PMID: [35737982](#).
- Buxton, R.T., Bergman, J.N., Lin, H.Y., Binley, A.D., Avery-Gomm, S., Schuster, R., and Bennett, J.R. 2020. Three lessons conservation science can learn from the COVID-19 pandemic. *Conservation Biology*, 34(6): 1331. doi:[10.1111/cobi.13652](#). PMID: [33044011](#).
- Chapron, G., and Arlettaz, R. 2008. Conservation: academics should ‘conserve or perish’. *Nature*, 451: 127. doi:[10.1038/451127b](#). PMID: [18185566](#).
- Cooke, S.J., Rytwinski, T., Taylor, J.J., Nyboer, E.A., Nguyen, V.M., Bennett, J.R., and Smol, J.P. 2020. On “success” in applied environmental research—what is it, how can it be achieved, and how does one know when it has been achieved? *Environmental Reviews*, 28(4): 357–372. doi:[10.1139/er-2020-0045](#).
- Cvitanovic, C., and Hobday, A.J. 2018. Building optimism at the environmental science-policy-practice interface through the study of bright spots. *Nature Communications*, 9(1): 3466. doi:[10.1038/s41467-018-05977-w](#). PMID: [30154434](#).
- Fonseca, C.R., Paterno, G.B., Guadagnin, D.L., Venticinque, E.M., Overbeck, G.E., Ganade, G., and Weisser, W.W. 2021. Conservation biology: four decades of problem-and solution-based research. *Perspectives in Ecology and Conservation*, 19(2): 121–130. doi:[10.1016/j.pecon.2021.03.003](#).
- Kadykalo, A.N., Buxton, R.T., Morrison, P., Anderson, C.M., Bickerton, H., Francis, C.M., and Fahrig, L. 2021. Bridging research and practice in conservation. *Conservation Biology*, 35(6): 1725–1737. doi:[10.1111/cobi.13732](#). PMID: [33738830](#).
- Keeler, B.L., and Locke, C. (eds). 2022. *Beyond the academy. Guidebook for the engaged university: best practices for reforming systems of reward, fostering engaged leadership, and promoting action-oriented scholarship*.
- Keeler, B.L., Chaplin-Kramer, R., Guerry, A.D., Addison, P.F., Bettigole, C., Burke, I.C., et al. 2017. Society is ready for a new kind of science—is academia? *Bioscience*, 67(7): 591–592. doi:[10.1093/biosci/bix051](#). PMID: [29599540](#).
- Lemieux, C.J., Groulx, M.W., Bocking, S., and Beechey, T.J. 2018. Evidence-based decision-making in Canada’s protected areas organizations: implications for management effectiveness. *Facets*, 3(1): 392–414. doi:[10.1139/facets-2017-0107](#).
- Lubchenco, J. 1998. Entering the century of the environment: a new social contract for science. *Science*, 279(5350): 491–497. doi:[10.1126/science.279.5350.491](#).
- Lubchenco, J. 2017. Environmental science in a post-truth world. *Frontiers in Ecology and the Environment*, 15(1): 3–3. doi:[10.1002/fee.1454](#).
- Mace, G.M. 2014. Whose conservation? *Science*, 345(6204): 1558–1560. doi:[10.1126/science.1254704](#). PMID: [25258063](#).
- Salafsky, N., Boshoven, J., Burivalova, Z., Dubois, N.S., Gomez, A., Johnson, A., et al. 2019. Defining and using evidence in conservation practice. *Conservation Science and Practice*, 1(5): e27. doi:[10.1111/csp2.27](#).
- The great divide. 2007. *Nature*, 450(7167): 135–136. doi:[10.1038/450135b](#).
- Williams, D.R., Balmford, A., and Wilcove, D.S. 2020. The past and future role of conservation science in saving biodiversity. *Conservation Letters*, 13(4): e12720. doi:[10.1111/conl.12720](#).
- Woolston, C. 2023. Measuring societal impact: how to go beyond standard publication metrics. *Nature*, 614(7947): 375–377. doi:[10.1038/d41586-023-00345-1](#). PMID: [36747114](#).