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Editorial: Women in conservation and restoration ecology 2022

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Editorial on the Research Topic
Women in conservation and restoration ecology 2022

Women scientists conduct ground-breaking research across the world. Yet, they made up to only 31.7% of all researchers globally in 2021, according to a recent report from the United Nations Educational, Scientific and Cultural Organization (UNESCO, 2024), and only about 4% of Nobel Prize laureates for science and medicine were women as of 2023 (The Nobel Prize, 2024). More broadly, the World Economic Forum (2023) reports that while workforce participation (based on LinkedIn profiles) of women and men is approximately equal in non-STEM fields, in STEM fields women represent only about 29% of workers, and the share of women's participation declines as positions become more senior. This is in part due to the "leaky pipeline" phenomenon, in which numbers of women in STEM fields decline progressively from student and early career roles to senior positions (Resmini, 2016). This leaves fewer women available for senior positions and the opportunities and accolades that come at a later career stage. It is also due to deeply entrenched but hidden biases faced by those who remain – which also contribute to the leaky pipeline in a persistent feedback loop. In short, while there are fewer women at senior levels, it is not because they are less competent or less passionate than men. Even accounting for this, women are still experiencing the consequences of unconscious bias throughout their careers. The academic currency for success is publications (preferably in high impact journals), research funding (preferably national and competitive) and esteem (respect and impact in one's field); there is evidence of gender bias in all of these.

Women get fewer opportunities for high impact publications. Nature recently published an editorial headlined "Nature publishes too few papers from women researchers – that must change" (Nature, 2024). In it, the authors note that only 17% of corresponding authors identify as women. They also note geographic differences, with percentages ranging from 4% (Japan) to 22% (United States), and find that acceptance rates among manuscripts sent for review were lower for woman-authored papers (46%) than for those authored by men (55%).

Women are less likely to apply for competitive national funding (Schmaling and Gallo, 2023). In Canada, for example, according to the most recent funding statistics from the Natural Sciences and Engineering Research Council, only 24% of applicants identify as women, though

success rates are similar for women and men (NSERC, 2023). Among early career researchers, women make up 37% of applicants and awardees. These statistics are reflected in other countries, such as Australia (Kingsley et al., 2023), the United States (Rissle et al., 2020), and the United Kingdom (Head et al., 2013; EPSRC, 2022).

In conservation careers, men influence conservation and science decisions more than women (James et al., 2023). The Nature Conservancy (TNC), as one of the world's largest conservation non-profit organizations, provides a case study to better understand how women publish relative to men in conservation science. A review of all papers from Web of Science with at least one Nature Conservancy author (1968–2019) found that women are underrepresented: only 36% of authors were women, 31% of all first authorships were women, and 24% of last authorships were women. Women in the Global South were the least represented group, making up less than 2% of all TNC authorships (James et al., 2022).

At the invitation of Frontiers, we, the Guest Editorial team, assembled a collection of conservation and restoration ecology research conducted by women scientists. This Research Topic celebrates the increasing contribution of women to this research field, and we hope its breadth and depth showcases some of the insightful work done by women and inspires the current and next generation of women scientists. A total of 11 contributions and 69 authors (nine original research articles and two reviews) report significant empirical and theoretical advances in conservation and restoration ecology, including also a study of gaps and gender biases in this field (listed in order of acceptance date):

- Use of runnels to mitigate marsh drowning (Watson et al.);
- Testing phylogenetic conservatism on the performance of seed germinability prediction models (Chen et al.);
- Impacts of fencing and grazing on insect diversity (Wang et al.);
- Pattern-building processes in vegetation recovery (Norris et al.);
- Use of movement data and physiological indicators to identify importance of habitat for migrating shorebirds (Linhart et al.);
- Gender bias in restoration and conservation (James et al.);
- Wetland restoration in tidal rivers (van Proosdij et al.);
- Integration of traditional ecological knowledge into land management (Souther et al.);
- Nutrient dynamics in created tidal marshes (Staver et al.);
- Dynamics of invertebrate communities in salt marsh pools after 50 years of restoration (Noel et al.);
- Global trends in geospatial conservation planning (Cobb et al.).

While the papers in this Research Topic partly reflect the fields of expertise and backgrounds of the guest editors, we hope that this Research Topic will help foster an international network of women researchers working in conservation and restoration. We aim to provide an impetus for future collaborations and discussions. We also hope that this Research Topic of discoveries helps to support and encourage other women wishing to pursue a career in conservation and restoration ecology.

Author contributions

IM: Conceptualization, Investigation, Writing – original draft, Writing – review & editing. DH: Conceptualization, Investigation, Writing – original draft, Writing – review & editing. MB: Conceptualization, Investigation, Writing – original draft, Writing – review & editing. CM: Conceptualization, Investigation, Writing – original draft, Writing – review & editing. AC: Conceptualization, Investigation, Writing – original draft, Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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