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Seeking a More Ethical Future for Ethnobiology Publishing: A 40-Year Perspective from *Journal of Ethnobiology*

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Abstract. The academic publishing world is rapidly changing. These changes are driven by and have implications for a range of intertwined ethical and financial considerations. In this essay, we situate *Journal of Ethnobiology* (JoE) in the discourse of ethical publishing, broadly, and in ethnobiology, specifically. We consider it an ethical imperative of JoE to promote the core values of the field of ethnobiology as a platform for scholarship that is both rigorous and socially just. We discuss here the many ways JoE addresses this imperative, including issues of diversity, accessibility, transparency, and how these efforts contribute to our ongoing relevance. We find that JoE has achieved high ethical standards and continues to raise the bar in our field. However, the growing incongruity between monetary solvency and best practices could threaten JoE's longevity unless we keep adapting to the changing landscape. Looking to the future, we encourage all ethnobiologists to participate in the ongoing process of improving ethics in publishing, including careful consideration of where to publish precious ethnobiological knowledge.

Keywords: ethical publishing, open access, ethnobiology, Plan S, hybrid journals, research equity

Introduction

Anyone who is paying even moderately close attention to recent developments in academic publishing will know that it is a volatile and rapidly changing landscape. In fact, over the last few decades, we have witnessed dramatic changes that shape the way we share, disseminate, and take in knowledge. For instance, when Steve Emslie and Steve Weber launched *Journal of Ethnobiology* (JoE) 40 years ago (see Emslie et al. 2018 for further details about the origins of JoE), there were only a few academic journals that even partially overlapped with the broad nature of ethnobiological research (e.g., *Economic Botany*, established in 1947; *Human Ecology* established in 1972). From the outset, JoE and the Society of Ethnobiology sought to bring together and nurture the interdisciplinary confluence of ethnobiology, including archaeology, anthropology, biology, linguistics, and ecology (Weber 1986; Wyndham et al. 2011). Consequently, ethnobiologists from around the world excitedly and whole-heartedly welcomed the idea of a journal fully dedicated to ethnobiology[1] (Weber 1986).

Since then, the number of venues for publishing ethnobiological research has burgeoned. These more expansive publishing opportunities stem not only from the birth of new regional and global ethnobiology-focused journals (e.g., *Asian Journal of Ethnobiology,* established in 2018, *Journal of Ethnobiology and Ethnomedicine* established in 2005; *Ethnobiology and Conservation*, established in 2012) or journals of more general focus that encompass ethnobiology (e.g., *People and Nature,* established in 2019), but also from a broadening in the natural and social sciences to embrace interdisciplinarity, the inclusion of diverse voices,

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and concerns about social and environmental justice (e.g., Brondizio 2017; Green et al. 2015; Lelé and Norgaard 2005). Since much ethnobiological research situates comfortably within this broadened vision, the research world is slowly waking up to the value of ethnobiology (e.g., Saslis-Lagoudakis and Clarke 2013), including the deep-time perspective that ethnobiology can bring to many discussions around conservation and sustainability issues (e.g., Armstrong et al. 2021; Briggs et al. 2006; Molnár and Babai 2021). All this means that JoE is no longer the only journal curating high-quality ethnobiological content. This is absolutely a good thing for the world, but it also means that JoE needs to be more strategic about attracting and promoting high-quality articles about the complex inter-relations between humans and their biological worlds.

In addition to these important substantive changes in ethnobiological publishing, specifically, there have been broader changes in publishing mechanics over the last few decades. The first issue of JoE, with its run of 1000 print copies, was handstuffed into mailing envelopes by "the Steves" in Steve Weber's basement (S. Emslie, pers. comm, December 9, 2020). Fast forward to the 1990s and early 2000s, when the Internet disrupted nearly all print media, online consortia like JSTOR and MUSE emerged, personal libraries shifted from physical paper to .pdfs, and a growing number of scholars began advocating paywall-free Open Access (OA; Laakso et al. 2011). JoE was slow to join the online world of journals; it was not until 2006, after being turned down by the big consortia, that JoE had the good fortune of being asked to join the non-profit publisher BioOne[2], where we remain today (Table 1).

Over the course of this time, other on-going developments in the academic publishing world significantly shaped who has access (and who does not) to academic knowledge, including ethnobiological knowledge. First is the stunning oligopoly by a few academic for-profit publishing giants who demand exorbitant costs from libraries or other revenue streams for access to their journals (Batterbury 2017; Larivière et al. 2015; Madras 2008). Another relevant development is the increasing reliance on journal impact factors as a broad-brush measure of the quality of articles published therein (Walter and Mullins 2019). Libraries prioritize high-end (read: big impact factor ratings) journals, which in turn charge extremely high subscription fees. This leaves little room in limited library and research budgets for subscriptions to small journals and societies (e.g., Burgman 2018; Hunter et al. 2012). All this results in an increasingly less diverse academic publishing landscape, at the detriment to science and to social justice (McNutt 2019).

Over the last few years, many scholars have actively debated the disparities in academic publishing (e.g., Brainard 2019; Koehlmoos and Smith 2011; Rabesandratana 2019). For instance, there is a move to evaluate journals by whether they follow Fair Open Access principles[3] (see also Veríssimo et al. 2020) and authors are beginning to choose the venue for their research based on these criteria. Relatedly, many are calling for a move away from evaluating scholarship by a journal's impact factor and towards the more meaningful evaluation of the impact of the article itself (Walter and Mullins 2019). In addition, academic editors are facing head-on the ethically uneven foundation of their specific journals and societies and are actively seeking ways to break down the colonial scholarly "gate-keeping" that has characterized many disciplines (e.g., Chin 2021; Kallio 2017). Finally, following the lead of the University of California library system, libraries are seeking "transformative agreements" with the large publishers to make academic publishing more accessible[4]. These and other developments are part of a welcome and much needed move to democratize scientific publishing (Fiala and Diamondis 2019; Pettorelli et al. 2020).

What role, then, can a small society journal like JoE play in this fast-changing publishing world? How can we contribute to diversifying and democratizing the ethnobiological publishing playing field and at the same time foster further appreciation and recognition of the richness of ethnobiology? What are the impediments that inhibit us from having a real impact on these on-going discussions? In this essay, we address some of these questions from our vantage points as scholars, authors, reviewers, and editors with JoE. The issues raised stem from many conversations over the years with colleagues at BioOne, Sheridan Press, the JoE editors, the Society of Ethnobiology board members, presidents of other academic societies, and other stakeholders in the publishing world.

Ethics and *Journal of Ethnobiology*

Ethical publishing, of course, begins with ethical research and ethnobiologists have a long history of seeking best ethical practices (e.g., Hardison and Bannister 2011; McAlvay et al. 2021). This is reflected in the Society of Ethnobiology by the adoption of the International Society of Ethnobiology code of ethics[5] and on-going workshops and discussions about best ethical practices within our discipline[6]. For many, best ethical practices go well beyond the now standard research requirements (e.g., Free Prior and Informed Consent) to engaging in truly collaborative initiatives with outcomes that primarily benefit Indigenous Peoples and local communities (Fernández-Llamazares et al. 2021). Not surprisingly, the moral and ethical dimen-

Table 1. The recent history of the *Journal of Ethnobiology*.

2005 - JoE joins non-profit publisher BioOne; all issues available on-line to Society members or people with library access to BioOne; Naomi Miller Editor.
2006 - Ranked with Scopus Journal Metrics (SJR) (0.141); reviews conducted via email rather than snail mail. First Editorial Assistant hired with Society funds. Rick Stepp Editor.
2008 - Maya Ethnobiology special issue—the first since 1983; Virginia Popper and Heather Trigg, Co-Editors.
2009 - Issues 1981–2004 scanned and available on-line; Contributions in Ethnobiology series established for longer publications; JoE included in Web of Science.
2010 - Journal redesign; Ethnobiology Letters established for shorter communications and book reviews. Pre-2005 issues available on the Society website and via Biodiversity Heritage Library.
2011 - First year evaluated with Journal Impact factor (JIF) with a ranking of 0.576.
2013 - OJS on-line submission system; Kris Gremillion, Dana Lepofsky, Lee Newsome Co-Editors.
2014 - Three issues per year, including one special issue; selection of one article per issue as Open Access; JIF > 1.0.
2015 - BioOne annual royalties > $20,000 USD; Steve Wolverton and Dana Lepofsky Co-Editors.
2016 - Four issues per year including two special issues and special sections; creation of Associate Editor positions; 500th article published.
2017 - Hybrid model where limited number of submissions can pay to be Open Access; BioOne annual royalties > $30,000 USD.
2018 - Editorial Board dissolved and replaced with Associate Editors; contract with Sheridan Press; Journal redesign; SJR = 0.639; JIF = 1.195.
2019 - Managing Editor position created (Jeffrey Wall).
2020 - Dana Lepofsky and Rob Quinlan Co-Editors; BioOne annual royalties ~$40,000 USD.
2021 - *Journal of Ethnobiology*'s 40th Anniversary.

sions of ethnobiology have been thoroughly covered in the pages of JoE (e.g., Armstrong and McAlvay 2019; Ludwig and El-Hani 2020). At JoE, we see it as an imperative to produce a socially just and scholarly journal that promotes the many aspects and values of ethnobiology. There are several aspects to this, which we broadly classify around the four main themes of diversity, accessibility, transparency, and relevance.

Diversity

At JoE, we are committed to diversifying the voices of ethnobiology and encourage submissions from around the world and from varied epistemic communities. JoE is relatively small on the grand playing field of academic publishing; however, we have the potential to play a critical role in promoting and amplifying the voices of a global community of scholars who are committed to documenting the diverse ways humans interact with their biological worlds. Examination of our publishing record displays that, while we are successful in some areas, we have work to do to fully fulfill this moral imperative.

One of our biggest apparent successes is the increased gender balance of our authors over time. Despite trends in other social sciences (Akbaritabar and Squazzoni 2020; Teele and Thelen 2017; West et al. 2013) and STEM disciplines (Huang et al. 2020; JEM Editorial Team 2020), the number of female-identifying first authors in JoE has increased over time, reaching a point of balance by the mid 2000s (Figure 1). While we are pleased to see that females are well represented in JoE pages, we suspect that this more broadly represents the actors doing the kind of anthropologically-grounded ethnobiological scholarship that is typical of our submissions (Weber 1986; Wyndham et al. 2011:Fig. 6) than our specific editorial policy. In fact, a recent meta-analysis of the potential of gender-based bias in academic reviews suggests that gender bias in the review process is not the underlying reason for gendered differences in publishing (Squazzoni et al. 2020).

We also have gender parity among our Associate Editors, many of whom are young scholars. We see the appointment of Associate Editors as a way to provide mentorship of scholars from diverse gender, cultural, and disciplinary backgrounds. In contrast to other journals that tend to be largely run and managed by senior scholars, at JoE, we strive to give opportunity to early-career ethnobiologists to gain an insider's view of the publishing world. While we are aware that many early-career scholars face huge publishing pressures for career advancement (e.g., Powell 2016), we also believe that being Associate Editors can pay big career dividends (see also D'Agostino 2019). These dividends include becoming familiar with how journals work and how Editors-in-Chief think, expanding networks, and providing opportunities to keep up-to-date with the latest ethnobiological thinking. We are careful about our Associate Editor's total service load and, in fact, many specify how many papers they want to handle per year. Importantly, most of our Associate Editors take pride in defining the trajectory and boundaries of knowledge in our discipline and see their service at JoE as a path to job satisfaction. In turn, JoE sees their involvement as critical to publication excellence; early-career editors and reviewers for whom inter-disciplinarity is second nature help to position JoE at the forefront of ethnobiological publishing.

Historically, as today, most JoE authors are from the US and Canada (Figures 2 and 3). Our editorial staff has employed several strategies to attract submission authors from around the globe, including inviting guest editing of special issues, and increasing the geographic breadth of our Associate Editors. These efforts have contributed to the rise in international authorship in published papers, including authors from the Global South (Figure 3).

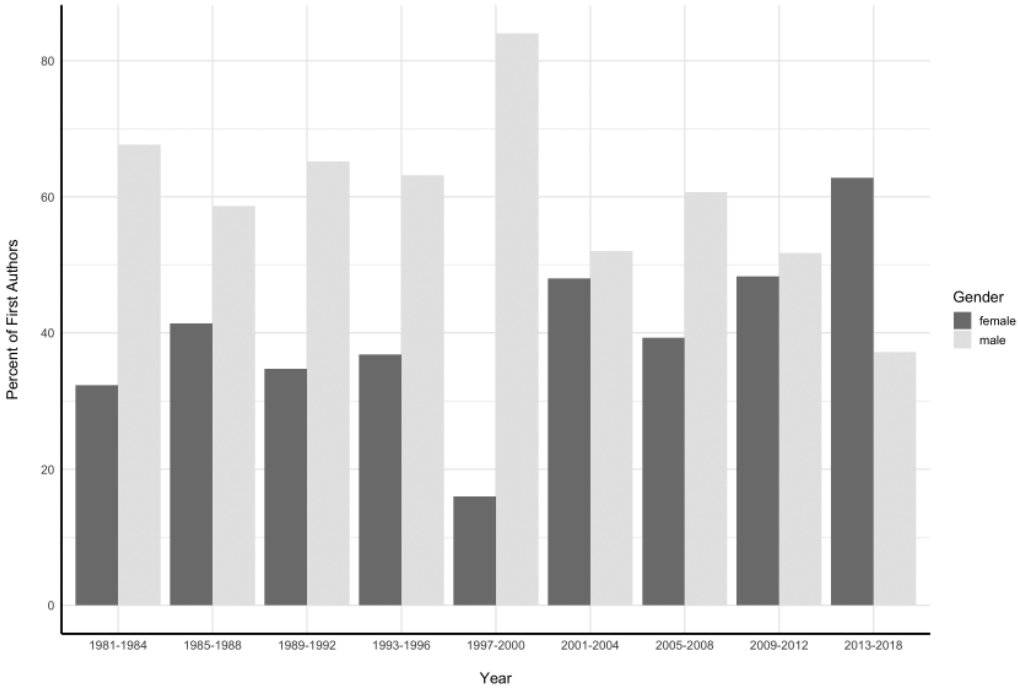

Figure 1. Percent of male and female first-authors of papers published in JoE over time, based on data gathered in Lepofsky et al. (2018). Sample excludes special issues. Coding is based on available online biographical information and may not accurately reflect authors' gender identities.

Because diverse authorship is central to our mission, we are cognizant of imbalances in English-language academic publishing, which tends to favor research from the Global North (Hicks et al. 2015; Lynch et al. 2021; Pettorelli et al. 2020). Several factors complicate the process of inclusivity, however. These go beyond disparities in research funding to include regional differences in research culture. For instance, some countries' institutions emphasize the collection and cataloguing of ethnobiological knowledge as their prime directive. This type of research goal is crucial and time-sensitive, particularly in remote areas of the world. However, while at JoE we recognize the value of such ethnobiological data compilations, our submission guidelines require broad contextualization in terms of theory, methods, and application. Our vision of a good JoE paper is one that connects with different disciplines and streams of knowledge; JoE is the nexus where all these different knowledges convene. Thus, we tend to reject papers when they are too narrowly contextualized, which can appear to disproportionately affect authors from institutions where highly specified research is the norm.

As an editorial team, we work to recognize cases when the submission's data show clear promise in terms of broader application, even when the initial product may not be sufficiently contextualized. When these cases include young scholars or scholars for whom English is not their first language, we offer to work directly with authors to help them frame their papers to address an expanded range of fields and contexts. Thus, unlike other high-caliber journals that might fully reject papers outright, we provide additional opportunity for authors to produce a quality product that speaks to the wide interdisciplinary audience of JoE. In addition, all submission authors have access to discounted professional editing

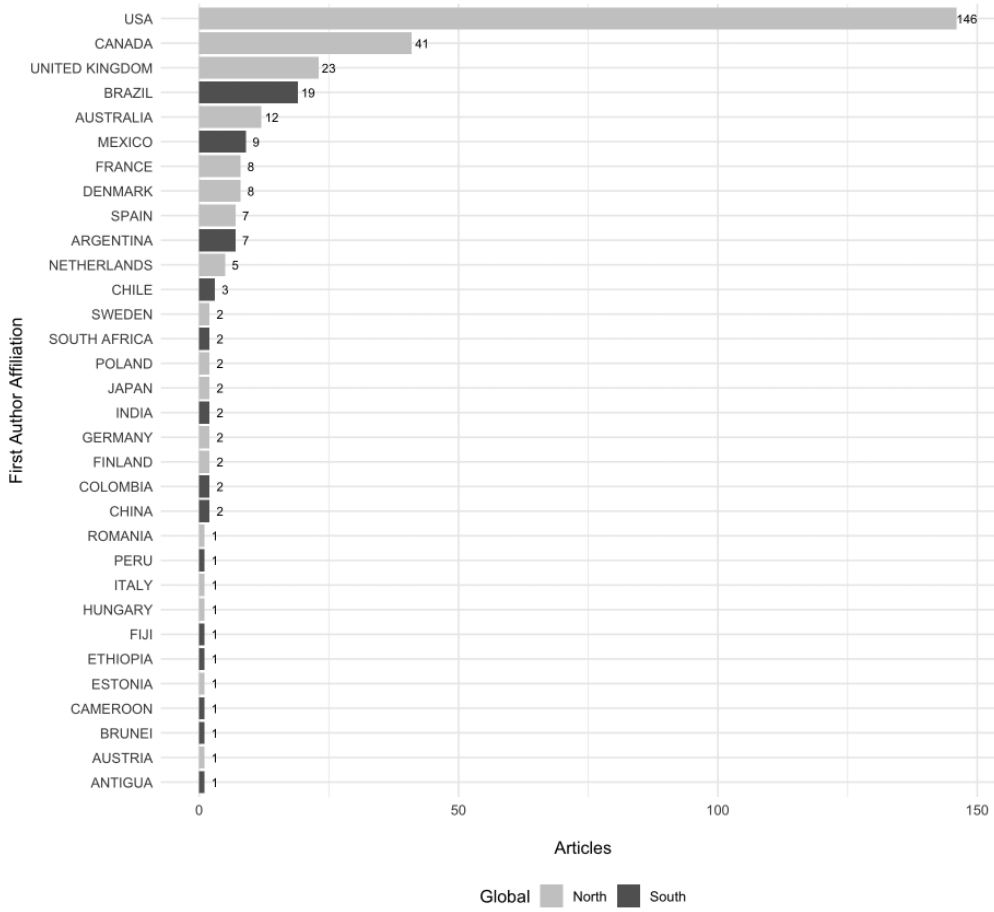

Figure 2. Article output by first author affiliation, from 2009–2020. We used the R package Bibliometrix to extract data from the WoS dataset (Aria and Cuccurullo 2017), and distinguished Global North and South per Mahler (2017).

services through BioOne[7]. It is important to note that we recognize and appreciate styles of communication other than the Western scientific model (e.g., storytelling).

The intent of our manuscript mentorship paradigm is to contribute to global equity; however, the process is still evolving. Extensive back-and-forth can protract our average times from submission to publication relative to some other journals[8]. This is especially so when compared to the increasing number of academic journals that minimize handling time metrics via the dubious practice of handing out "reject and resubmit" decisions on all papers, no matter how minimal or extensive the revisions required (see Cooke 2014). Despite the difficulty in assessing comparisons in review turn-around time between journals, we do recognize that any long review process is potentially frustrating for all involved. Additionally, our mentorship paradigm burdens peer reviewers in terms of time and unpaid labor, an issue that has received attention in academic discourse (Brainard 2021). Thus, our effort to build a fair and equitable mentorship model in our review process is still ongoing, as we work to balance the needs and views of all parties involved.

Finally, JoE supports diversity by actively encouraging co-authorship from all contributors to the research process. We applaud

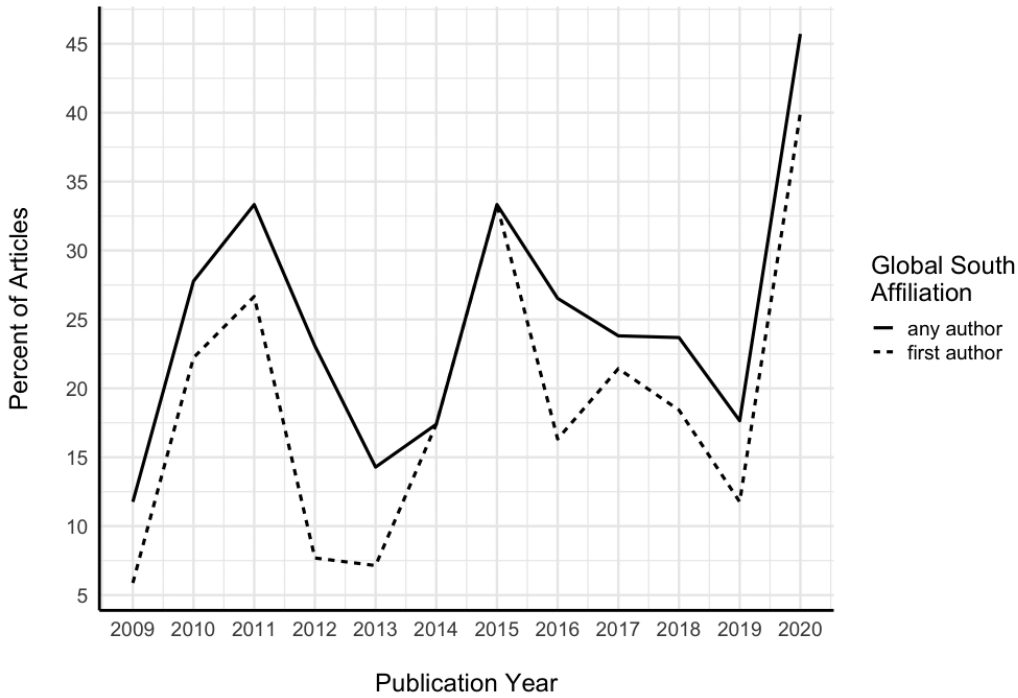

Figure 3. Percent of articles by authors affiliated with Global South over time. We used the R package Bibliometrix to extract data from the WoS dataset (Aria and Cuccurullo 2017), and distinguished Global North and South per Mahler (2017).

the long-term and now-increasingly common practice within ethnobiology of recognizing diverse kinds of knowledge contributed to all stages of the research process, including the intellectual contributions by Indigenous knowledge holders (e.g., Johnson-Gottesfeld and Anderson 1988, and papers in Armstrong and McAlvay 2019; see Cooke et al. 2021 and McAlvay et al. 2021). While published affiliation does not necessarily allow us to evaluate people's origin community or identity, our contributions show an increase in author collaborations between the Global North and South over the last decade, suggesting an uptick in intercultural and international partnerships (Figure 3). Between 2009 and 2020, our overall collaboration index (3.07 via WoS metrics) and high proportion on multi-authored papers (66%) demonstrate our authors' commitment to collaboration (Figure 4). We strongly support meaningful inclusion of members of Indigenous Peoples and local communities as co-authors as a way to honor all knowledge holders in our publication endeavors.

Accessibility

Accessibility is central to ethical publishing and, indeed, most of the recent discussions about ethical scholarly publishing focus on this issue. Accessible publishing has two linked financial dimensions: monetary requirements that prevent authors publishing in some journals and paywalls that limit access to published articles. These are in addition to the economic and cultural barriers to producing publishable articles discussed above.

There is a burgeoning discussion and debate in diverse forums about the monetary barriers to publication and the value of open access to resolve these barriers. Monetary barriers come in the form of Arti-

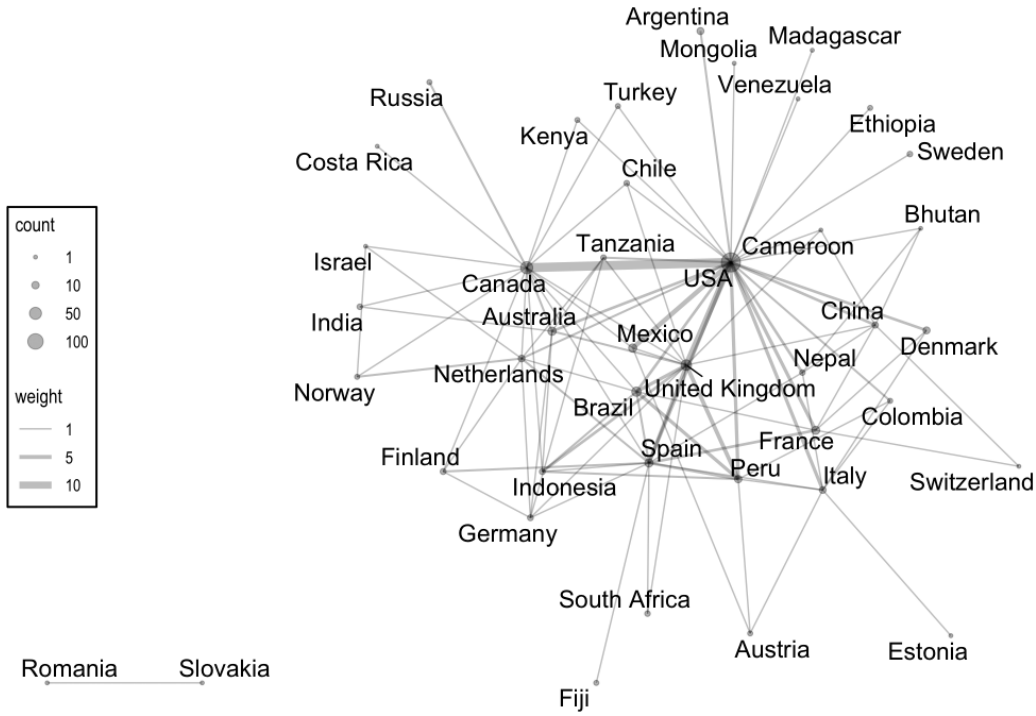

Figure 4. *Journal of Ethnobiology* international collaborations on co-authored papers, 2009–2020. Node sizes represent the number of publications where a country affiliation occurs at least once (e.g., the USA appears on 173 multi-country papers, the next largest, Canada, is on 51). Edge weight indicates the number of collaborations between countries, where 1 = the co-occurrence of two affiliations on a paper (e.g., the USA and Canada share 13 papers). Authors from Brunei, Hungary, Japan, and Poland produced single-country publications only, and do not appear in this network. We used the R package Bibliometrix to extract data from the WOS text dataset (Aria and Cuccurullo 2017), and plotted the network using igraph (Csardi and Nepusz 2006); other package contingencies and methods available on request.

cle Processing Charges (APC), which may or may not cover making an article OA. Take for instance, *PNAS*, published by the National Academy of Science—a non-profit American organization. To cover the operations of this high impact journal, *PNAS* charges authors ~$1400–$4000 USD to publish an article, depending on length. These charges may be waived upon request. To make an article OA, there is an additional surcharge of ~$2500 USD. APC waivers for publishing fees are sometimes granted on request and, within six months, all *PNAS* articles become OA. This system works well for a journal like *PNAS*, because their prestigious reputation and high submission rate allows them to publish only the most impactful papers.

However, we have all witnessed the potential weaknesses of this pay-to-publish model. One manifestation of this is the daily onslaught in our in-boxes of publishing invitations from predatory journals. However, the pay-to-publish model can also influence legitimate journals, especially those that are small to medium-sized. That is, these smaller OA journals must accept a certain number of fully paid submissions to stay afloat and to offer a few waivers to those who cannot afford OA fees. The traps of such a revenue stream could easily push a journal dangerously close to a publishing model that values quantity of publications over quality (Alizon 2018). Further complicating the ethics of a pay-to-publish model is that the majority of people who might

qualify for OA waivers are not applying for them and instead are paying APC out of their own pocket because they are not aware of the possibility of a waiver[9].

While the ethical implications (pro and con) of OA have been on the radar of publishers for a long while, the Plan S initiative has further fueled the discussion in recent years[10] (Else 2021). As of this year, Plan S requires that all articles resulting from research funded by public grants must be published in fully open access (not hybrid) journals or platforms. Soon after its implementation, Google Scholar began flagging on every author's page all such funded articles that are not published as open access. What's more, Google offers the possibility of immediately uploading the flagged article to the Google website so it will be freely available through the Google platform. This option and self-archiving platforms are increasingly popular alternatives to journal-led OA. The situation is further complicated by the recent emergence of illegal channels for uploading and accessing research articles ("black open access"; Björk 2017). At JoE, we do not encourage self-archiving because it will ultimately affect download-generated revenue from BioOne, but we understand the desire to promote scholarship in this way. The growing prevalence and incentivization of self-archiving promises to be another game-changer in the ongoing development of academic publishing.

Currently, JoE offers a hybrid publishing model that we believe is the most equitable model for both our authors and readers. On the author's side of the equation, JoE does not have and never has had APCs of any kind. That is, publishing through normal channels in JoE is free to all and is in no way influenced by whether an author can and will pay APCs. This model reflects our firm commitment to removing all financial barriers to publishing in JoE and to maintaining an impartial review process. After acceptance, we encourage authors to become members of the Society, as a way of promoting the field of ethnobiology more broadly. Note that at JoE, we retain copyright of articles in order to protect misuse of the ethnobiological knowledge reported within. However, authors retain the full rights to reuse any portion of their publication without obtaining permission from (or making any payment to) the Society of Ethnobiology[11].

For an article to be OA in JoE, an author can pay an OA fee, currently set at $1200 USD. We determined this amount by calculating what it would take to cover the costs of running JoE and the Society if all articles were OA. We note that while this is a low OA fee relative to many other international journals, it is slightly above the amount suggested in a recent evaluation of ethical publishing models (Veríssimo et al. 2020).

In addition to elective author-paid OA, the Editors can choose to make an article OA free of charge. As per our agreement with BioOne, we can make up to 25% of our yearly output OA with no penalty to revenue from royalties (see discussion of our business model, below). There is much discussion among JoE editors about whether we should give this "free" open access status to articles that would have wide ranging interest in the communities who are the focus of the paper or to those papers that we think will bring the greatest attention to JoE. Our decision is influenced by the fact that few local community organizations subscribe to academic journals and, thus, much published ethnobiological content is often not accessible to them.

Given the potential ethical ramifications of choosing which articles are given OA status, we investigated the effects that OA has on citations of our papers. To our surprise, we found that open access status does not have a long-term effect on how often a JoE article will be cited, but it does give an initial advantage following publication. In other words, OA articles are more likely to be cited at least once soon after

publication than articles in their non-OA cohort, but the effect fades over time with the exposure of all articles (Figure 5).

Author-paid OA is currently only a small part of our hybrid publishing model. This is because most of our authors cannot afford to pay and, thus, we only get about two such requests per year. In fact, in a recent Society of Ethnobiology membership survey, 71% of respondents (total N of respondents = 104) said they would not or could not pay APCs for making their arti-

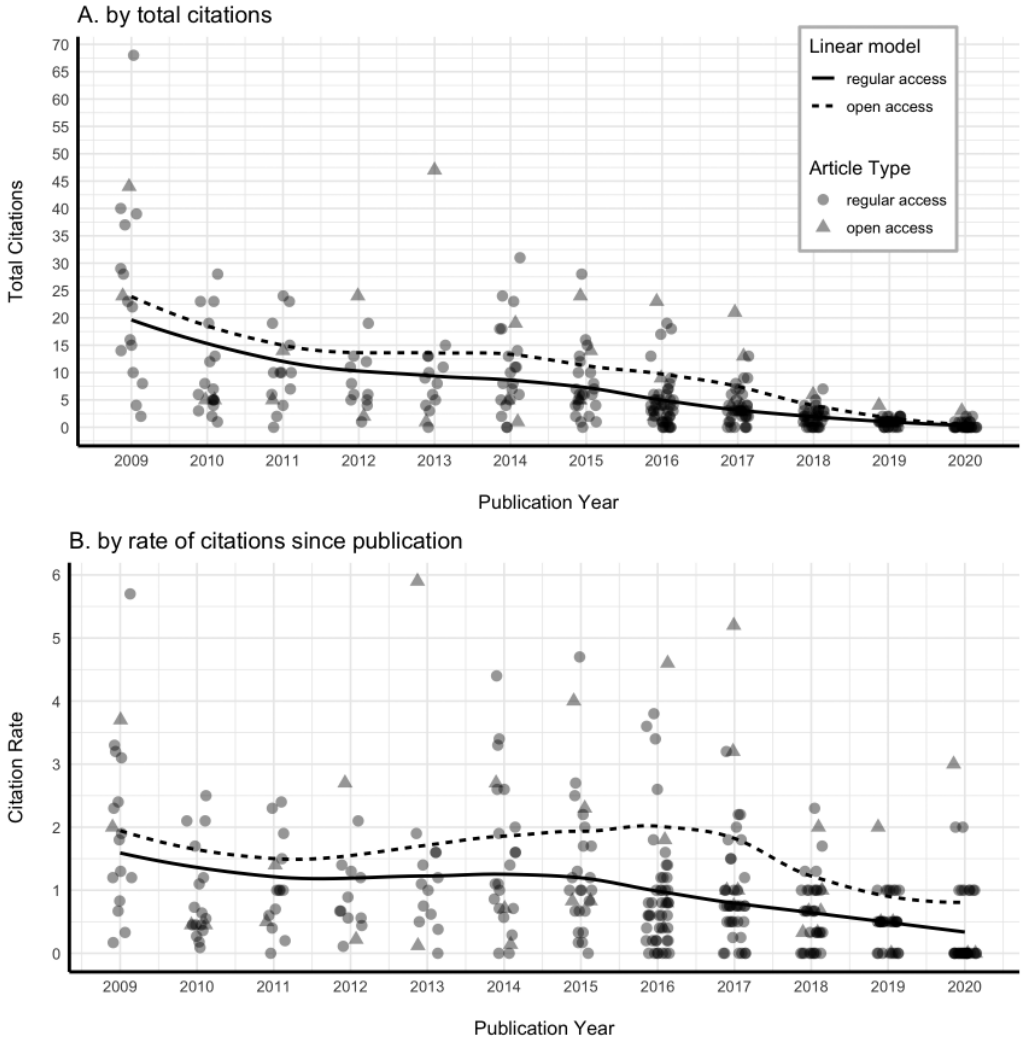

Figure 5. Comparison of open and regular access as total citations and overall citation rate since publication. For open access (OA), n = 39, and regular access (RA), n = 286. A. Using total citations, For OA, mean = 9, median = 4, standard deviation = 11.455. For RA, mean = 5.814, median = 3, standard deviation = 8.081. Wilcoxen's rank sum test for a difference in medians: W = 4575.5, p-value = 0.0673. B. When observed as a rate of total citations per total years since the publication date, OA does have a medium effect-size on citation (Cohen's D = 0.608), however the significance in the difference in medians is marginal. For overall citations rates of OA articles, mean = 1.507, median = 0.707 citations per year, standard deviation = 1.534. For RA, mean = 0.901, medianv0.833, standard deviation = 0.902. Wilcoxen's rank sum test: W = 4485.5, p-value = 0.0464. Two-sample t-test: t = −2.413, df = 41.658, p-value = 0.0203. Note we do not have a fine-grained metric of citations per year. We used the R package Bibliometrix to extract data from the WOS text dataset (Aria and Cuccurullo 2017) and added OA status.

cle OA. An additional 20% said they would pay if the charges were < $500 USD. Only three respondents said they would pay the > $1000/article that we would need for every article to cover production costs of JoE to become fully OA. This reluctance may, in part, reflect the fact that ethnobiological research tends to be less well funded than in the STEM disciplines (Anderson 2011) and, thus, the grant funds may not be available for APCs. For instance, we note that ~37% of JoE publications do not mention a funding agency. Collectively, these data do not bode well for a fully OA JoE in the future.

In addition to OA, there are many other ways to access our journal content readily and affordably. All issues published before 2005 (1981–2004) are freely accessible to all[12]. These papers represent the historical foundations of JoE and the conceptual, theoretical, and methodological underpinnings of the discipline. We have no way of evaluating the effects on citations or downloads of making these articles open access but making them freely available to everyone reflects our commitment to making ethnobiology widely accessible. In addition, if a reader is not part of the 1350 institutions whose library subscribes to BioOne[13], they can download a more recent JoE article from BioOne for only $10 USD or can take advantage of the Society of Ethnobiology's low membership dues and receive unlimited access to all Society publications. Furthermore, we are currently trialing having our latest journal issues available for free online only access for one month. Finally, as a member of the Research4Life program[14], BioOne makes all its content available online to eligible institutions in lower- and middle-income countries. This program makes the journal fully available at no cost to more than 2500 institutions all around the world, providing students and researchers in low-income countries with access to critical and current ethnobiological research (Koehlmoos and Smith 2011).

Additionally, at JoE, we strive to make our research accessible through other means and channels. JoE's social media channels and the *Forage!* Blog[15] are available to all our authors aiming to communicate their research to broader audiences. In 2021, the Society of Ethnobiology's Twitter reached over 2400 followers. All the articles published at JoE are advertised both through the Society's Twitter and Facebook accounts and we offer support to authors wishing to promote their articles via press releases. Not surprisingly, some of our articles have garnered substantial media visibility (e.g., Bonta et al. 2017; Chambers et al. 2020; Fernández-Llamazares and Lepofsky 2019). Our advertised strategy is another important means to make ethnobiological research widely accessible to the general public.

While we believe that our current hybrid model is both the most ethical in terms of access and the most financially sound for JoE and the Society in the short term, we are aware that it might not be the most viable marketing model in the long run. This is because of the tangled connections among OA, journal impact factors, and highly cited submissions. As long as the research community continues to evaluate papers by the journal in which they are published rather than solely on the quality of article, people will be drawn to publishing in higher ranked journals and to spend their precious OA funds on those articles. This iterative process ultimately drives down the number of submissions to journals such as JoE, which in turn influences that journal's impact factor and its ability to eventually become fully OA. At JoE, we are cognizant of the fact that we must be market-savvy if we are going to fulfill our ethically driven mission to broadly promote ethnobiological knowledge.

Transparency

Central to recent discussions about ethical scholarly publishing are calls for increased transparency so authors can make

informed choices about where to publish[16]. There are many aspects of this, some of which we already discussed above. Here we discuss in more detail data access, our review process, and our business model.

Among STEM disciplines, a top priority around transparency is the need to make data widely available so that studies can be reproduced and built upon (e.g., the TOP Guidelines from STEM research[17]). While we applaud efforts to make research results widely available, in the case of ethnobiology, there are often ethical concerns that preclude publishing data in full (e.g., detailed lists of important places and taxa, cultural protocols, intellectual property rights of Indigenous Peoples and local communities; Golan et al. 2019). Recognizing this, we encourage authors to mention explicitly issues of data sharing in their submissions so the research community can gain a fuller understanding of the ethical issues associated with presenting cultural data.

The JoE's approach to transparency starts by having a transparent ownership and management structure, which is fully controlled by a responsive scholarly community. In contrast to journals with governing bodies outside the scope of the discipline and/or opaque editorial boards, JoE is backed by a respected organization (the Society of Ethnobiology) with a track record of publishing ethnobiological research of the highest standards. Our Editorial board and policies are outlined in detail in our website[18] and the Society of Ethnobiology has oversight of our publishing strategy. We have full editorial control over the research that we publish and our partnerships with BioOne and Sheridan Press only concern the dissemination and branding strategy of our journal.

Concerning our review process, we are constantly seeking ways to be both rigorous and encouraging and inclusive. Our review process begins as soon as a paper is submitted through our online journal management system, OJS[19]. Authors have noted that this system is not as user-friendly as other systems used by the publishing giants. However, we use OJS because it is free and open access and because it is designed by a consortium of universities to level the publishing playing field.

After a paper is submitted, unless it is clearly unsuitable (e.g., a widely inappropriate topic, way below our word count, poorly written, etc.), the co-Editors-in-Chief (EiC) and the Managing Editor discuss suitability for external review. In some cases, if a paper shows promise but is not ready to send for review, we reject with comments for improvement with an invitation to resubmit a stronger paper more likely to make it through the review process. If a paper is deemed suitable to be sent for external review, we seek two to three experts in the field to evaluate the paper. Sometimes the task of seeking reviewers falls to one of our Associate Editors (AE) who will be managing the paper. In some instances, on a closer read, the AE might suggest sending the paper back to the author with detailed comments before sending for external review. The EiCs are responsible for oversight of the entire process.

Our system is a single blind review process, meaning that the reviewers know who the authors of the paper are, but the authors generally do not know the identity of the reviewers. In some cases, given the relatively small size of the ethnobiological community, authors can surmise the identity of the reviewer. In other cases, our reviewers choose to self-identify so that they can have a more open conversation with the author. If a submission to JoE is authored by one of the EiCs or our Managing Editor, the editor without a conflict of interest handles the review process through email so that the process is blind to the other editors who have access to the on-line system.

After the reviews are submitted, the AE, if there is one, will collate the reviews and make an initial decision which will be forwarded to one of the EiCs who, at this point, will read the paper and the collated reviews and make a decision going forward.

If, in the rare case that the EiC deems that some reviewer comments are unprofessional in some way, those comments are not forwarded to the authors. If asked to resubmit, the EiC and the AE work closely with the authors to give them the best chance of publishing a high-quality paper.

Concerning our business model, our finances are tightly tied to that of the Society of Ethnobiology. That is, in addition to journal production, many of the great initiatives of our Society (including our other publications) depend on the yearly dividends generated from BioOne royalties to JoE (based on number of downloads per article). As paradoxical as this might sound, the Society of Ethnobiology relies largely on journal revenue from non-OA articles for funding educational programs, public outreach events, and capacity-building opportunities specifically aimed at making ethnobiology widely accessible. At JoE, specifically, production costs include those for the copyeditors, an honorarium for the Managing Editor, and sometimes an honorarium for the EiCs, depending on their institutional support. Since 2018, JoE has been published by Sheridan Press. We appreciate that Sheridan Press is committed to working closely with us to minimize costs and produce issues that are highly professional, and that they are an organization committed to socially and environmentally responsible publishing[20].

Relevance

Fundamental to ethical publishing within ethnobiology is to ensure the relevance of our papers to societal and ecological needs. Foundational to this is the simple act of archiving ethnobiological data from communities who seek to have this knowledge documented and shared. Beyond this, we have a responsibility to use our privilege as ethnobiologists to promote social and environmental justice and to discuss honestly and openly the social-ecological contexts in which we operate.

Given the potential of ethnobiological knowledge to address a range of social and ecological problems globally (e.g., Fernández-Llamazares et al. 2021), a foundational ethical imperative of JoE is to broadly disseminate high caliber ethnobiological research. To do so means maintaining the highest publishing standards, including evaluating papers through rigorous review and working closely with authors. Furthermore, since we do not rely on authors' fees to support the journal, we can focus on quality over quantity. Ultimately, by producing articles that are high impact, we maximize the reach of ethnobiology and honor the diverse knowledge systems it encompasses. The fact that JoE's older papers continue to be cited and downloaded as much as our recent ones (Figure 6) reflects the on-going and deep relevance of the ethnobiological knowledge that is archived in JoE.

Many articles published at JoE have significantly shaped the international research and knowledge landscape of ethnobiology and are featured as classic readings in the syllabi of courses all over the world (e.g., Cuerrier et al. 2015; Pfeiffer and Butz 2005; Turner et al. 2009). Much of the research that JoE has published throughout its 40-year history is now built into the very fabric of the global ethnobiology research community.

An analysis of keywords of papers published in JoE reflects the importance JoE authors place on socially and ecologically relevant research (Figure 7). The network analysis also reflects an increasing trend among Western scientists (e.g., Ban et al. 2018; Hill et al. 2020; Tengö et al. 2014) to recognize the tightly bound linkages among ethnobiological knowledge, management, conservation, and biodiversity. At JoE, we are committed to providing a platform where social and political action and rigorous scholarly research are intertwined (e.g., Armstrong and McAlvay 2019).

Part of the success in our publication strategy has been the launching of 24 special issues since 2008 (Table 2), focused on off-the-beaten-track topics, and sitting

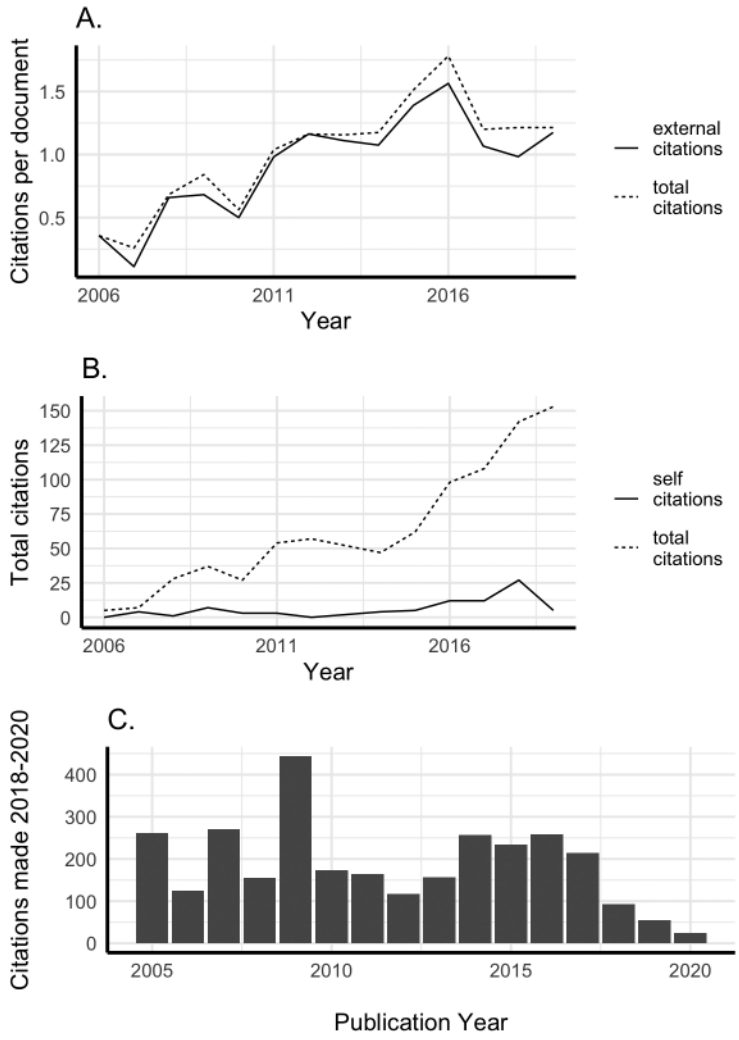

Figure 6. Citation behavior on a three-year rolling basis (A and B), and as a snapshot of the past three years (C.). Note that in 2014, article output increased due to special issues. **A**. External (those outside of JoE) and total citations from SCImago (n.d.). Citations counted on a three-year rolling basis, where each year represents citations of journal articles that were published in the previous three years. **B.** Self-citations (citations of JoE articles within JoE), also from SCImago (n.d.). **C.** Citations made within the last three years, for each annual journal volume (BioOne data). Note that articles published between 2005 and 2010 represent 47.6 % of the citations made in this period.

at the cutting edge of modern ethnobiology. These issues have allowed for and encouraged the explicit integration of ideas and scholars of diverse ethnobiological communities. Some of our collections have been highly influential in our field (e.g., Armstrong and McAlvay 2019; Emery and Hurley 2016), while others contribute to diversify our readership and build bridges with other disciplines that share a synchronous focus with ethnobiology (e.g., Fernández-Llamazares and Lepofsky 2019; Ingram 2020; Quintana Morales et al. 2017). Importantly, some compilations have pushed the boundaries of ethnobiology by focusing on uncharted topics and new subfields (e.g., Burgos et al. 2019; Wall et al. 2020), and others have helped

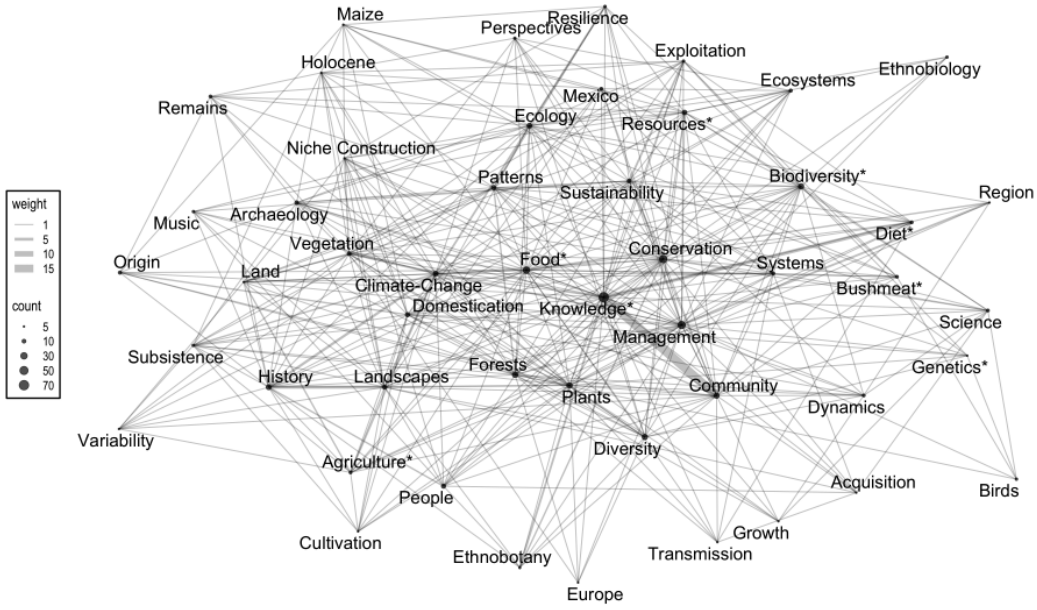

Figure 7. Network of author-provided keywords with five or more occurrences in JoE articles published between 2009 and 2020 (n = 270 articles reporting author keywords). Asterisks indicate where multiple highly similar or synonymous keywords are combined into a single term, e.g., "Knowledge*" includes "Traditional Ecological Knowledge," "Ecological Knowledge," "Local Knowledge," etc. Node size indicates the total number of articles where each keyword appears (counts). Line weights indicate number of articles where one keyword co-occurs with another. The most frequent author keywords are: Knowledge* (70), Conservation (40), Management (40), Food* (30), Forests (21), Plants (21), Biodiversity* (20), Diversity (20), Community (19), and History (17).
We used the R package Bibliometrix to extract data from the WOS text dataset (Aria and Cuccurullo 2017), and plotted the network using igraph (Csardi and Nepusz 2006); other package contingencies and methods available on request.

to amplify the voices of ethnobiologists in global conversations about environmental change, planetary sustainability, and Indigenous Peoples' rights (e.g., Nolan and Pieroni 2014; Wolverton et al. 2014).

Furthermore, to stay timely and relevant, we have strived to launch our special issues with well-planned strategies. For instance, the special section on "Ethnobiology and Cannabis" was launched at the time the federal Cannabis Act came into effect in Canada (Glover 2018), and the recent "Ethnobiology of Bats" special issue was published in the midst of the COVID-19 pandemic, when misinformed public representations of bats as a threat to human health rapidly revived bats' negative stigma (Rocha et al. 2021). Our 40th Anniversary issue exemplifies the growing relevance of our discipline and our journal, and features explorations of our place in global conversations around decolonizing knowledge-building processes (McAlvay et al. 2021), the future of international conservation policy (Carino and Farhan Ferrari 2021), and in the context of the wide-ranging "World Scientists' Warning to Humanity" movement (Fernández-Llamazares et al. 2021). We are determined to continue solidifying the societal and policy relevance of JoE in the years to come.

Final Thoughts

It remains to be seen how small journals like JoE will fare in the ever-shifting landscape of academic publishing—where the ethics of publishing are entangled with monetary concerns. In a playing field where

Table 2. The 24 Special Issues and Special Sections published in *Journal of Ethnobiology*.

Year	Title	Guest Editors
2008	Maya Ethnobiology	A. Ford and K. E. Emery
2009	The Past, Present, and Future of Traditional Resource and Environmental Management	D. Lepofsky
2014	Climate Change and Ethnobiology	S. Wolverton, K. Chambers, and J. R. Veteto
	Food Security in a Changing World	J. M. Nolan and A. Pieroni
2015	Fire Ecology and Ethnobiology	C. T. Fowler and J. R. Welch
2016	Botanical Ontologies	L. Daly, K. French, T. L. Miller, and L. Nic Eoin
	Archaeology as Ethnobiology	L. Nagaoka and S. Wolverton
	Urban Ethnobiology	M. Emery and P. Hurley
	Birds I	N. Sault
2017	Birds II	N. Sault
	Ethnobiology and Fisheries	E. M. Quintana Morales
	21st Century Pastoralism and Biodiversity Conservation	K. E. French
	Empirical and Model-Based Agricultural Studies in Archaeology	A. Gillreath-Brown and R. K. Bocinsky
2018	Honoring Steve Weber	
	Ethnobiology and Cannabis	D. Glover
	Ethnobiology and Children	S. Gallois and V. Reyes-García
	Feral Dynamics	N. Bubandt and A. Tsing
2019	Ethnobiology and Mollusks	A. Burgos and A. C. Younger
	Ethnobiology Through Song	Á. Fernández-Llamazares and D. Lepofsky
	Action Ethnobiology	C. G. Armstrong and A. C. McAlvay
2020	Wild Meat in Changing Times	D. J. Ingram
	Ethnobiology of Dogs	P. Cunningham-Smith and K. Emery
	Ethnobiology and Sweeteners	J. Wall and I. Teixidor-Toneu
2021	Ethnobiology of Bats	R. Rocha, A. López-Baucells, and Á. Fernández-Llamazares
	Climate Change and Indigenous Peoples (forthcoming)	X. Li, A. Braga Junqueira, and V. Reyes-García

large publishers like *Nature* can comply with the Plan S requirement by charging $11,500 USD for an OA article, small journals will have difficulty competing. Yet, there is also widespread recognition in the publishing world for the need to preserve publishing programs of societies who rely on revenue surpluses to support society activities[21]. At *Journal of Ethnobiology*, we must continue to face questions head-on about the value of journal revenue to support initiatives like scholarships and awards versus the ethical benefits of OA (e.g., Brainard 2019; Fisher 2020). We must also realistically consider whether we have the author base to become fully open access or if this will require

somehow changing our mandate. Though OA may appear to be the great equalizer, we must consider how the push to full OA could magnify existing inequities within academic publishing between the Global North and South, and the cultural and natural sciences (Batterbury 2017; Burgman 2018; Tennant et al. 2016).

Future efforts for more ethical practices at the journal level must co-exist with reassessments of research and professional practices, more broadly. At the epistemic level, this includes interrogating deeply rooted ideologies for evaluating knowledge, and rethinking the metrics of impactful science. The competitive "publish or perish" professional model of academe pressures scholars to attain/maintain positions via high publication volume (Curry and Lillis 2018; Lynch et al. 2021). Not only does this paradigm select for lower-quality output (Smaldino and McElreath 2016), it also disincentivizes publication in smaller journals, as authors seek journals with rapid turn-around times and high returns on prestige. This distorts the field in favor of traditionally high-impact factor, English-language journals and hurts the smaller platforms like JoE (Shimanski and Alperin 2018).

As editors, authors, and global citizens, it is our responsibility to keep the conversation of ethical publishing active. As individual scholars, this means considering carefully where to publish papers and archive precious ethnobiological knowledge. By choosing to publish, review, read, and cite journals with an ethical vision in place, we can influence a transition towards a more equitable publishing system. Ethnobiologists should give careful consideration to the ethics of their publishing choices, thereby helping to build the future we want for ethnobiological publishing. Criteria beyond the impact factor need to be foregrounded when choosing where to publish our research or where to volunteer our time as editors and reviewers. The onus is on each of us to ask, does the journal put monetary gain before ethical concerns of diversity, accessibility, and quality? Does it value other ways of knowing on par with Western knowledge? Is the journal widely available in institutions in the Global North and the Global South? Keeping this conversation transparent and dynamic will result in a more diverse publishing landscape and, thus, a more ethical and equitable publishing context for all. We have collective agency to shape the future of publishing in ethnobiology.

Acknowledgments

Our heartfelt thanks go to our mentors, colleagues, and friends in the Society of Ethnobiology. So much of how we act as ethnobiologists and, indeed, as thinking and caring human beings, stems from the knowledge shared in the context of Society discussions. In relation to *Journal of Ethnobiology,* specifically, we have immense gratitude to Steve Emslie and Steve Weber for the vision and determination that led those two 20-somethings to initiate the JoE's 40-year journey. From the first issue onward, countless ethnobiologists have embraced "the Steves'" original vision of honoring the breadth and depth of ethnobiological knowledge by documenting this knowledge in the pages of the *Journal of Ethnobiology*. We thank you all for making our Journal and our field so rich and so diverse.

Notes

[1] https://ethnobiology.org/interview-steve-weber-and-steve-emslie-founding-society-ethnobiology-hd-5-june-2014-1026.
[2] https://bioone.org/.
[3] https://www.fairopenaccess.org/the-fair-open-access-principles/.
[4] https://scholarlykitchen.sspnet.org/2021/03/16/the-biggest-big-deal/.
[5] http://www.ethnobiology.net/what-we-do/core-programs/ise-ethics-program/code-of-ethics/.
[6] http://www.ethnobiology.net/what-we-do/core-programs/ise-ethics-program/code-of-ethics/.
[7] https://www.cwauthors.com/BioOne.
[8] https://ethnobiology.org/publications/journal-of-ethnobiology/about.
[9] https://scholarlykitchen.sspnet.org/2021/04/19/

guest-post-apc-waiver-policies-a-job-half-done/?informz=1.
[10] https://www.coalition-s.org/about/.
[11] https://journalofethnobiology.org/index.php/jeb/about/submissions#copyrightnotice.
[12] https://ethnobiology.org/publications/journal-of-ethnobiology/back-issues; https://www.biodiversitylibrary.org/bibliography/47071#/summary.
[13] https://bioone.org/subscribe/list-of-subscribers.
[14] www.research4life.org.
[15] https://ethnobiology.org/forage/blog.
[16] https://publicationethics.org/resources/guidelines-new/principles-transparency-and-best-practice-scholarly-publishing.
[17] https://osf.io/ud578/.
[18] https://ethnobiology.org/publications/journal-of-ethnobiology/about.
[19] http://pkp.sfu.ca.
[20] https://www.sheridan.com/about-us/environmental-practices.
[21] https://www.socpc.org/post/so-why-do-society-journals-matter.

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