

Conservation publications and their provisions to protect research participants

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Title: Conservation publications and their provisions to protect research participants

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Article Impact Statement:

Conservation articles often poorly describe ethical safeguards, and journals should ensure authors report ethical considerations.

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Social science, informed consent, anonymity, institutional review boards, hunting, interviews, human research ethics, rule-breaking

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Abstract

Social science methods are increasingly applied in conservation research. However, the conservation sector has received criticism for inadequate application of ethical rigour when research involves people, particularly when investigating sensitive or illegal topics. We conducted a systematic review to investigate a) journal's ethical policies when publishing research that involves human participants, and b) the ethical safeguards documented by authors in conservation articles. Focusing on studies that used social science methods to research hunting of wildlife by local people, we reviewed 185 studies published in 57 journals. Only 37% of journals required authors to report ethical safeguards in manuscripts, and 55% of all articles reported ethical safeguards. We identified a significant mismatch between journals ethics policies and their publication practice, and found ethics were often poorly described, with insufficient detail to determine the quality of the safeguards implemented. We encourage authors to rigorously report ethical safeguards in publications. We urge journals to make ethics statements mandatory, to provide explicit guidelines to authors outlining their ethical reporting standards and to ensure compliance throughout the peer-review process.

Introduction

In recent decades, there has been a push to adopt social science research methods in conservation (Büscher & Wolmer 2007; Sutherland et al. 2018) in recognition of the ability of social science to improve conservation practice (Bennett et al. 2017) and the realization that understanding social systems is imperative for achieving conservation objectives (Mascia et al. 2003; Milner-Gulland 2012). Yet, despite the increasing emphasis on interdisciplinarity, social scientists remain a minority within the discipline (Bennett et al. 2016). Conservation is typically characterized by scientists trained in natural sciences (Fox et al. 2006); often poorly equipped to undertake research that requires extensive knowledge of social science techniques (Drury et al. 2011; Campbell 2005). Subsequently, conservation has been criticized for poor social science research practice, and for applying insufficient ethical rigor when conducting research that involves human participants (St John et al. 2014). Conservationists have been accused of thoughtless disclosure of research findings and for failing to consider the ethical implications of research (Solomon et al. 2016; St John et al. 2016).

Ethics underpins conservation; partly because the founding principles of the discipline stem from ethical beliefs in the intrinsic value of biodiversity, but also because the science of conservation is ethically contentious (Van Houtan 2006; Robinson 2011; Miller et al. 2011). A primary aim of conservation science is to enact positive change for the benefit of biodiversity (Meine et al. 2006; Kareiva & Marvier 2012), yet doing so often impacts negatively on the well-being of communities who depend on the same biodiversity (Agrawal & Redford 2009; McKinnon et al. 2016). Moreover, conservation research is frequently conducted within poor, resource dependent communities, in cultural contexts where gender roles differ, power imbalances prevail, and against backdrops where conservation is a concept imposed by outsiders (Dowie 2009). If these factors are inadequately considered, research risks infringing human rights (Brockington et al. 2006).

Researchers have moral, professional and increasingly legal obligations to act ethically and with good moral intention (Wiles 2013). Research ethics builds on the principles of beneficence, whereby the dignity, rights, autonomy and welfare of participants are protected; non-maleficence, whereby it is ensured that research does not cause harm; and justice, whereby the benefits and burdens of research are distributed equally among participants (Aluwihare-Samaranayake 2012; Wiles 2013). Beyond simply being the right thing to do (Vanclay et al. 2013), implementing research ethics helps maintain the trust and social goodwill of the various 'publics' with and for whom researchers work, and assures research integrity (Israel & Hay 2006). This is particularly important as much research occurs unobserved, providing significant scope for improper conduct. By demonstrating ethical

behavior, researchers promote confidence both in the research process and the reliability of research findings (Israel & Hay 2006).

Various guidelines and codes of conduct exist to inform ethical research practice when working with people. Typically, these provide frameworks for thinking through ethical dilemmas when they arise in research (Wiles 2013), and are produced by governments, funders (e.g. UK's [Economic and Social Research Council](#)) as well as the professional associations of specific disciplines. For example, the Codes of Ethics of the [American Association of Anthropology](#) and [British Psychological Society](#) outline discipline specific ethics guidelines, which also elaborate and extend national and international guidelines. Within conservation, the Code of Ethics of the Society for Conservation Biology acknowledges that research should always “*Protect the rights and welfare of human subjects used in research*” (SCB 2004), with conservationists typically referred to codes established by disciplines such as sociology, geography and anthropology for guidance (see Watson 2010).

Over the last two decades, the regulation of research ethics has increased significantly (Wiles 2013); most western institutions now require researchers to obtain ethical approval from Institutional Review Boards (IRBs, also known as Ethical Review Boards, Research Ethics Boards and Research Ethics Committees) prior to commencing research (Speiglmán & Spear 2008; Dyer & Demeritt 2009). This process is underpinned by the concept of Informed Consent; which seeks to ensure research is not coerced by describing the purpose, methods and intended uses of research (Wax 1980; Guillemin & Gillam 2004), along with a discussion of the risks and benefits of participation in a language understandable to participants before research commences (Speiglmán & Spear 2008; ESRC 2015). Informed consent, if sought diligently, should ensure that potential participants are provided with all the information they need to make informed and independent decisions about whether to participate. Where appropriate, IRBs may also require researchers to assure anonymity (whereby participants remain unidentified) and/or confidentiality (whereby researchers protect information from being discovered by others) (Vanclay et al. 2013; Wiles 2013), particularly when researching sensitive behaviors or topics, such as hunting.

Today, overhunting poses one of the greatest threats to wildlife worldwide, and is a high priority for conservation research (Ripple et al. 2016; Benitez-Lopez et al. 2017). Social science methods such as interviews have risen in prominence within the conservation research toolbox (Newing 2010; Young et al. 2018) and are increasingly applied in hunting research to profile those involved (e.g. Harrison et al. 2015); quantify the prevalence of damaging behaviors (e.g. Nuno et al. 2013); and to identify why these behaviors occur (e.g.

Knapp 2012). Findings may result in measures to protect biodiversity by, for example, increasing the enforcement of environmental rules (St John et al. 2016).

However, investigating hunting presents specific ethical challenges. In many contexts hunting wildlife is illegal, and thus research requires respondents to incriminate themselves or their community by reporting information about rule-breaking (Solomon et al. 2007). Although results may be critical for conservation outcomes, the ethics of placing people in such positions is questionable. Participants may hesitate to engage in research and be wary of reporting the truth due to potential repercussions; resultant data may suffer bias (Gavin et al. 2010). While measures can be adopted to assure greater anonymity and mitigate against dishonest or biased responses (Nuno & St John 2015), research endows researchers with influential knowledge, which if published thoughtlessly can disproportionately affect all involved (St John et al. 2016).

During the publication process, peer-review provides a critical point at which the quality, scientific excellence and ethical integrity of research is assessed and endorsed (Solomon 2007). Once published, articles become reference points for the development of future research and ethical practice. Yet, when reading articles to develop the design of our own research, we observed that human research ethics were rarely addressed or mentioned in published literature, a trend also noted by Young et al. (2018) in a review of the use of interviews in conservation research. This is both surprising and concerning; publishing articles without the inclusion of ethical safeguards risks validating low-quality social science and perpetuates poor research practice (St John et al. 2014).

In response, we undertook a systematic review to assess the extent to which ethical safeguards are described in peer-reviewed conservation publications. We recognize that research ethics is a broad field that embodies many issues; here we focus only on the measures to protect human participants documented by authors within articles. We specifically selected research that utilized social science methods to investigate wildlife hunting as a case study; partly because this reflects our own area of expertise, but also because of the specific ethical challenges associated with conducting sensitive social research on rule-breaking. Our specific research objectives were:

- 1) To review the guidelines journals, offer to authors, and the ethical standards journals required authors to report on in publications.
- 2) To infer, based on the information about ethical safeguards included in articles, the extent to which conservation studies adhere to currently accepted standards for human research ethics.

- 3) To describe the types of safeguards and ethical considerations documented by authors to protect human research participants.

Methods

Search Criteria & Selection

Between August 2017 and May 2018, we conducted systematic searches in Google Scholar, Scopus and the Web of Science using the search term “hunting OR wildlife OR hunter OR bushmeat OR wild meat OR poaching OR poacher AND interview”. We selected this phrase as it encompasses the broad ways in which hunting and those who hunt are described in the literature. ‘Interview’ is a common umbrella term used to describe collecting data from people, for example, people are ‘interviewed’ when questionnaires or surveys are administered, and interviews frequently precede or compliment other data collection methods.

We restricted searches to English language research articles published between January 2000 and May 2018. We confined our search through Web of Science and Scopus to articles published in conservation biology, ecology or zoology journals, limiting the sample to conservationists publishing in their own journals. We acknowledge this excluded relevant research published in interdisciplinary journals, however, the review specifically aimed to assess the levels of human ethics reporting by conservationists, who we assumed usually target peer-reviewed conservation journals for publication. Google Scholar did not permit restrictions by journal subject, therefore some articles published in wider journals were also included. Searches produced 4456 studies. For full review guidelines, see Appendix (S1).

Each title was scanned independently by HI and SB. Cohen’s Kappa Statistic was used to assess the level of agreement between reviewers when accepting or rejecting titles. A result of 0.67 suggested substantive agreement (Watson & Petrie 2010). 626 articles were accepted for abstract review.

At abstract review, we accepted any articles that referenced the use of interviews or any other social science method that involved gathering data from local people (e.g. self-reporting, questionnaire or focus-groups) to investigate hunting of terrestrial species. We restricted our search to studies that investigated the hunting activities of local communities in countries situated in south and south east Asia, Africa, Central and South America, as this is where

most research effort is concentrated and ethical issues arise. Any studies that featured trophy or sports hunting were excluded. 185 studies were accepted for full review.

Data extraction

Articles were randomly allocated between authors, and information was extracted on: publication journal, research country, species of research interest, legal status of hunting, research methods used, and the ethical safeguards towards human participants included. We assessed the rigor with which authors reported on ethical safeguards, by identifying whether any of the following four criteria were reported on:

1. Authors acknowledged research underwent formal ethical review by an IRB or equivalent, and/or an IRB reference was given,
2. Authors acknowledged research sought participants consent,
3. Authors acknowledged that the research participants or communities were offered assurances of anonymity and/or confidentiality,
4. Authors acknowledged research was developed or conducted following a recognized ethical code of conduct.

While these narrow criteria exclude other ethical issues such as data protection and data security, they represent the basic ethical safeguards IRBs require researchers to consider during research (ESRC 2015). While it could be assumed that if IRB approval was reported then safeguards such as consent and anonymity/confidentiality were likely to also have been considered as part of the ethical review process, we aimed to test whether they were explicitly reported. In recognition that IRBs are not present in every institution, and that some researchers may follow ethical codes of conduct instead of, or in addition to IRBs, we also included this as a fourth assessment criterion. All articles were read and cross checked by both authors. If uncertainty arose, articles were discussed on a case by case basis and the decision agreed by both authors was recorded.

Journal requirements

We gathered data on the ethics policy of each journal featured in the review. In June 2018, we visited the website of each journal and extracted all relevant information. Usually information was located in a 'Guidelines to Authors' section. We coded results to identify the types of ethical safeguards journals required authors to confirm adherence to, and report on in manuscripts. We contacted journal editors via email and asked each to complete a short questionnaire (see S2) about when ethics policies were introduced, the composition of the

editorial board (proportion of social vs natural scientists) and the journals' peer-review process. A follow-up email was sent two weeks after the first to prompt responses.

Statement on human subjects

Prior to contacting journal editors, we sought ethical guidance from the University of Oxford Central University Research Ethics Committee. We were advised ethical approval was not required for this research. Nonetheless, free, prior and informed consent was sought from all journal editors, and individuals were assured that their responses would remain anonymous and confidential.

Results

Sample Characteristics

The 185 articles were published in 57 different academic journals. As expected, the majority of articles were published in journals dedicated to conservation, ecology or zoology ($n = 178$, 96% (Appendix S3 & S4)). The sample also included seven articles published in social science or generic science journals such as PLoS One. 53% of articles were published in just five journals (S3). 76% of reviewed articles were published after 2010, suggesting both increased research interest, and increased adoption of social survey techniques to investigate hunting.

52% of studies were undertaken in Africa, 26% in Latin America and 22% on the Asian sub-continent (Fig. 1, S4). There was a bias in research effort with over a fifth of studies conducted in one of two countries: Tanzania or Brazil. Articles were published by 153 different authors, with 24 authors accounting for 31% of the publications (S4). Only 29% of articles were authored by researchers based at institutions in the country where research was conducted. We found several authors published multiple articles from one specific site or country, presumably from research conducted as part of an extended study (e.g. doctoral thesis). These were considered as separate data points, our justification being that whilst authors may have used the same ethical guidelines throughout their research, their reporting may have differed depending on the methods used or the publication journal.

The majority of research focused on generic bushmeat hunting (70%), where bushmeat is defined as “any non-domesticated terrestrial mammal, bird, reptile or amphibian harvested for food” (Nasi et al. 2008). The remaining studies focused on targeted hunting of specific

species or groups, including ungulates (8%), carnivores (5%), primates (5%), small mammals (5%), birds (4%) and reptiles (2%).

95% of all studies used interview or questionnaire methodologies to collect data. The remaining 5% of studies used other social science methods. 46% of studies used multiple methods to triangulate findings and increase data reliability, including focus group discussions (11% of all articles), observation / hunter follows (18%), and self-reporting (e.g. hunting or meal diaries (25%)).

1) Journals and Human Research Ethics

Of the 57 journals reviewed, 27 (47% of all journals) had an ethics policy for research that involved animal subjects, while 21 journals (37%) had an ethics policy for research involving human subjects. Overall, 20 journals (35%) provided policies on both. Broadly, these policies outlined four criteria research had to satisfy to be eligible for publication (Table 1). 19 journals (33%) required information on these criteria to be included within manuscripts. One journal stated human research ethics should be considered, but did not explicitly state whether authors should document them, while another required authors to assent abidance to an ethical code of conduct upon submission of a manuscript. This code contained detailed stipulations regarding informed consent, the welfare of animal subjects, recognition of local collaborators as co-authors and the dissemination of research, but no reporting requirements were outlined.

Frequently, we found the policies to be inappropriate, or to use unsuitable terminology. In five instances human participants were referred to as ‘patients’, and ethical requirements were framed in the context of clinical trials, human experimentation or medical research, rather than conservation, ecological or zoological research. In addition, 76% of journals that referenced a Code of Conduct recommended the Helsinki Declaration; a code of practice originally developed for experimental medical research by the World Medical Association in 1964 (Carlson et al. 2004), suggesting guidelines were generic to the publishing house, rather than specifically developed by the journal.

Do journals uphold their stated ethical principles when publishing conservation research?

The 21 journals that published policies on human research ethics accounted for 122 (66% of all) articles within the review. Yet, only 71 (58%) of these articles documented ethical safeguards, and frequently we found articles failed to meet journals’ requirements (Table 2). Ten journals stated that research should meet outlined ethical requirements or editors

reserved the right not to publish. However, of the 73 articles published in these journals, 45% did not include any information on research ethics. We found no significant relationship between whether a journal required ethics, and the inclusion of ethics within manuscripts ($\chi^2= 1.473$, $df = 1$, $p\text{-value} = 0.225$). The reporting of research ethics did not differ between ecology, zoology, conservation and interdisciplinary journals publishing research on hunting, although articles published in journals with a higher impact factor were 0.78 times more likely to report implementing safeguards (S5).

Has this changed over time?

One factor contributing to this mismatch may be that articles were published before journals introduced their ethics policies. We contacted the Editors-in-Chief of the 19 journals in which two or more articles were published ($n=146$, 79% of articles) to ask when policies were introduced. Of the 19 Editors contacted, ten completed the questionnaire (52%), one declined. On average, editors estimated 36% (min: 0%, max: 90%, median: 30%) of their editorial boards contained reviewers with social science expertise, and editors believed their journals did either ok (50%) or well (50%) at ensuring only ethically appropriate research was published. Only three editors provided information about when ethics guidelines were introduced, while one editor informed us that their journal previously had no ethics policy with regards to research that involves people, but they had developed one since receiving our email. For the 43 articles published in years which we know journals definitely had policies in place, nearly 50% failed to include any information on ethical safeguards (Fig. 2). However, we did detect an upward trend in the proportion of studies published each year that included ethical safeguards since 2000 (Fig. 3).

2) How many articles reported ethical safeguards?

Overall, 101 articles (55% of all articles reviewed) included at least one of the four ethical safeguards (Table 3). Typically, information on ethics was located in the methods (88% of articles that included ethics), acknowledgements (5%), or both (7%). Of these, only 35 articles (19% of all articles) identified that research had been reviewed and approved by an IRB, based in an academic institution (81% of articles with IRB), government department (18%) or NGO (11%). No ethical safeguards were mentioned in 45% of all articles. As we did not contact authors directly, we were unable to discern whether ethics were considered and implemented during research but not reported in articles (reporting bias), or whether they were omitted from the research process altogether (poor research practice).

3) Types of ethical safeguards documented by authors

Consent

81 (44%) of all articles reported seeking participant consent (Table 3), however, the way in which consent was sought was only reported in 29 articles (36%). 26 articles reported securing consent verbally (32% of articles that documented consent), three articles (4%) secured written consent, while three articles (4%) identified that written consent would be inappropriate due to high illiteracy levels. Consent was typically sought from individual participants, but occasionally consent was obtained at the community level, e.g. from the village chief. However, if subsequent consent was also sought from participating individuals was not always clear.

When discussing consent, authors rarely used the same terminology. In only five articles was consent described as ‘Free, Prior and Informed Consent’ (Table 4). In 16 articles (20% of those that reported seeking participant consent) authors stated respondents consented to participate voluntarily (Free consent), using phrases such as ‘interviews only proceeded with respondents’ permission’, or ‘respondents were told they could skip any uncomfortable questions or could abort interviews at any time’. In 19 articles (24%) authors explained the research purpose to participants before seeking consent (Informed consent). Few articles described explaining potential risks of participation. Consent was described as both free and informed in a further 31 articles (39%). In 10 articles (12%), consent was sought but no indication of whether consent was free, or informed was provided.

Anonymity & Confidentiality

Anonymity was reported as assured in 44 articles (24%), 11 articles (6% of all articles) documented offering respondents’ confidentiality, while four articles (2%) reported both. Anonymity was typically afforded at the individual or household level, either by not recording names or by anonymizing data after collection. Six articles (3%) suggested that respondents would be more inclined to reveal the truth about sensitive or illegal hunting behavior if responses were anonymous or confidential. In five articles (3%), authors also anonymized village locations to afford communities greater protection from potential reprisals. However, in 86 articles (46%), the specific village or location where research was conducted was named, either by listing the name, location coordinates, or labelling the name and location on a map. In several instances, authors provided individual estimates of each community’s hunting activity. In one article, the author assured village-level anonymity, yet they had previously published research from the same site in which villages were named.

Research sensitivity

In 129 articles (70% of all articles) hunting wildlife was an illegal or restricted activity while in a further 32 articles (17%) the status of hunting was undescribed (Table 5). Nearly all of these articles required participants to self-report their hunting activity (n=151, 94%). In 73 of these articles (45%), authors highlighted the sensitivity of the research topic and the subsequent implications for data quality and/or participant engagement. Ethical safeguards were only documented in 58% of articles (n=94) where the status of hunting was illegal, restricted or unknown (Table 5).

Adoption of specialized research methods

During the review, we identified 18 articles (10% of all articles) in which authors reported using specific methods to afford respondents greater anonymity and to minimize biases (e.g. underreporting due to social desirability bias) associated with asking questions about sensitive behaviors. Seven articles reported asking respondents about hunting indirectly, either by asking questions about community level (rather than individual) hunting or by encouraging respondents to reply in the third person to prevent implication in illicit activity. One article used choice experiments to assess respondent's willingness to hunt under different livelihood and law enforcement scenarios, while one asked questions in a group setting, and another used Fuzzy-Logic Cognitive Mapping in a group setting to reduce the reliance on individual reporting. In eight articles (4%), authors documented using the Randomized Response Technique (RRT) (4 articles) or the Unmatched Count Technique (UCT) (4 articles), both of which are methods designed to assure respondents' greater anonymity. However, to triangulate results and test method reliability, respondents were also asked directly about hunting activity. Several authors reviewed the merits of UCT and RRT, but deemed them inappropriate or inapplicable methods for their research context.

Discussion

Social science methods are increasingly applied in conservation research (Bennett et al. 2016; Young et al. 2018). Within our sample, we documented a rise since 2010 in the number of studies using interviews to research hunting, and an increase in the proportion of articles published per year that featured ethical safeguards, suggesting reporting of ethics is becoming more common. However, we often found too few safeguards were documented per article; just one study met all four of our ethical criteria and only 9% of studies listed at least three safeguards.

Frequently, safeguards were poorly described, thus we lacked sufficient detail to determine the quality of the safeguards implemented. Of the studies that listed consent, many failed to identify whether consent was 'informed'. In addition, we noted inconsistency in how consent was sought, and from whom. Best-practice guidelines such as those of the [International](#)

[Society of Ethnobiology Code of Ethics](#) recommend seeking consent at both individual and population levels. Yet often consent was only identified as sought at the individual or community level. While mechanisms such as communal consent might be most suitable in strongly hierarchical societies, used in isolation, they can undermine individuals' freedom to opt in or out of research. Consequent participation may reflect social obligation, rather than genuine desire to be included. The absence of a shared vocabulary, alongside poor acknowledgement and discussion of these types of ethical issues within articles may reflect insufficient ethics training, and highlights a pressing need for capacity building and the mainstreaming of research ethics practice throughout the conservation sector.

Adequately assuring anonymity

Asking local people, often in contexts where power imbalances prevail, to report sensitive behaviors without asking if they desire anonymity is ethically questionable. Anonymity can help build participant trust, enhance receptivity to questioning, and increase honest reporting (Ong & Weiss 2000). Yet, anonymity was rarely referenced in articles. Some articles documented using indirect questioning techniques such as RRT and UCT to assure greater anonymity (Nuno & St John 2015), however, these methods were always employed alongside direct questioning. Although this is necessary to verify the robustness of estimates, it undermines any additional protection as participants are still required to directly identify their behavior. While we welcome the addition of these techniques to conservation's methodological toolbox; they do not present a panacea for overcoming ethically challenging aspects of research. Additional research is required to ascertain how much protection is assured, and how these methods are best used. Detailed guidelines such as those by Hinsley et al. (2019) are excellent first steps for outlining best practice in conservation.

Research locations were identified either by name or coordinates in nearly half of all hunting studies. Although identifying study sites appears to be a common practice in conservation, we, along with others, urge greater caution when doing so (Solomon et al. 2016; St John et al. 2016). If results for sensitive activities are publicly reported at the community level (e.g. by village name), communities may be subject to direct reprisals. It can also undermine any assurances of anonymity, especially if research is conducted in communities where households are few, or participants are easily identifiable. Adopting community pseudonyms in publications and not identifying research locations on maps are precautionary measures authors can implement in publications to better safe-guard participants from reprisals (Solomon et al. 2007, 2016; St John et al. 2016). However, achieving this may pose challenge, as identifying locations is often necessary to enable meaningful interpretation of results (St John et al. 2016). If anonymity is not possible to assure, we encourage researchers to report why this is so, alongside alternate measures implemented to protect research participants.

Additionally, within our sample, we encountered authors who presumably published multiple articles from one research project. In earlier articles communities were named, but in more recent publications communities were anonymized. This change in approach may result from different journal requirements, or perhaps signify a shift towards greater ethical awareness. Regardless, this highlights that researchers should be aware that once published research cannot be redacted, and thus thorough consideration of the ethical implications must occur before publication.

Ethical exclusion

Nearly half of the articles (45%) reviewed failed to report human research ethics. Although, this does not suggest that these studies failed to employ ethical safeguards, it raises questions about the ethical integrity of research. As an inherent aspect of social research design, we argue ethical safeguards should always be reported in peer-reviewed articles. A principal purpose of published literature is to inform future research design. Yet, if publications fail to reference research ethics, how can researchers learn to strengthen future research ethics and practice? Whilst identifying the cause of this exclusion was beyond the scope of this review, insufficient word limits and author and/or reviewer oversight are two plausible causes. Some of these challenges can easily be overcome by, for example, placing ethical approval references in acknowledgements, which are generally excluded from word counts, and by providing greater guidance to authors and peer-reviewers on ethics reporting. Requiring the routine submission of research protocols, either as appendices or in open-access repositories, alongside manuscripts would enable readers to learn from previous researchers, ensure appropriate ethical procedures were met, and promote greater transparency in the research process.

Given the medical origins of ethical review (Carlson et al. 2004; Wiles 2013), we acknowledge that procedural measures outlined by IRBs aren't always appropriate or attainable in conservation contexts. Generally, however, there is agreement that ethical review protects participants and promotes research transparency (Vanclay et al. 2013). So much so, that formal ethical review is increasingly becoming a mandatory and legal prerequisite of governments, funders and institutions (Speiglmann & Spear 2008; Dyer & Demeritt 2009). While there is often a tendency for ethical review processes to be viewed as a bureaucratic 'box-ticking' exercise (Dyer & Demeritt 2009; Lunn 2014), procedural ethics do offer researchers a vital 'checklist' of ethical factors to consider (Guillemin & Gillam 2004). As researchers are increasingly required to secure IRB approval, we urge researchers to document this, along with the specific safeguards implemented in manuscripts. Not only does this strengthen the quality of research, but it removes the ability of readers to doubt the ethical integrity of research, and thus of conservation as a sector.

With whom does responsibility lie?

If researchers are responsible for conducting ethical research, then responsibility for publishing research of ethical rigor lies along all stages of the publication chain (St John et al. 2016; Teel et al. 2018). As gatekeepers to publication, journals have power to ensure research is ethically conducted, and that only ethical research is published. However, to do so requires transparent and explicit ethics policies. Yet within our sample, we found only 37% of journals outline the ethical measures they expected authors to abide by or include when publishing research that involved people and where provided, information was sometimes inappropriate. While our results suggest journals are performing better than 20 years ago when a similar study found only 3% of conservation/ecology, wildlife and zoology journals issued instructions to authors regarding human research ethics issues (Marsh & Eros 1999), significant progress is still required.

One immediate way to rectify this is for journals to review and revise their ethics policies and the instructions issued to authors. Journals must provide researchers with fair, equitable and explicit best practice guidelines. These must be relevant to conservation contexts, and should clearly outline the basis for rejection. Some examples do exist (see Oryx 2001; Wilmé et al. 2016), however, these could be developed further by explicitly identifying reporting standards in a way similar to Freckleton (2018) for the publication of code. The inclusion of ethics statements in manuscripts should be mandatory, and statements should identify whether research was approved by an ethical review board (IRB), if a code of conduct was followed, the process of informed consent, and whether safeguards such as anonymity or confidentiality were assured, alongside discussions of ethical challenges encountered. Authors should be supported to achieve this through the provision of sufficient word space. In addition, to promote transparency and accountability, journals should encourage the publication of research protocols as appendices. However, in recognition of the fact that much conservation research is conducted by authors from institutions governed by different rules, research standards and ethical expertise (St John et al. 2016), we warn against the adoption of blanket policies which only enable authors with IRB clearance to publish; as this may exclude researchers based in small under-resourced organizations (St John et al. 2016).

In our review journal stipulations did not guarantee compliance; ethics were omitted in over 40% of articles where ethics were supposedly required. One reason might be that articles were published after guidelines were introduced, however, of the journals that could be assessed we found 50% of articles published after guidelines were introduced still failed to include ethical safeguards. Our results highlight a significant mismatch between journals' stipulations and their publication practice suggesting, at least within our sample, that journals are failing to comply with their own standards with regards to research that involves human subjects. If conservation journals truly intend to increase publication of high-quality social

science (Teel et al. 2018), they must ensure all manuscripts are scrutinized with appropriate levels of ethical rigor, and in accordance with published journal policy. In order to achieve this, journal editorial boards must be comprised of those with adequate expertise to properly review social science research (Campbell 2005), those reviewing research must adhere to the guidelines of the journal and ensure manuscripts adequately document ethical considerations. Only research that meets the high-quality standards outlined by the journal should be published (St John et al. 2016).

Review limitations

We reiterate that our review by no means represents a comprehensive assessment of human research ethics in conservation publication or practice. We focused our attention only on a narrow scope of ethical criteria, in a specific area of research (hunting), and we do not compare the performance of the conservation sector relative to other disciplines. While our findings do not suggest conservation practitioners are failing to act ethically, they do demonstrate that conservationists are failing to report the safeguards implemented to protect human participants. We acknowledge that we negate to discuss many important ethical issues in our review, for example, we do not address issues such as data security and storage, nor do we review the role of power dynamics in research or how ethical safeguards should be extended to others involved in research such as research assistants. However, rarely did we encounter discussions of these issues within manuscripts. Given the poor coverage of even the most basic ethical safeguards in articles, we felt highlighting the absence of these fundamentals was a critical first step.

We also believe it important to note that our review focusses only on academic literature. Yet, unpublished ‘practitioner-generated’ research represents a considerable portion of hunting literature. Although human research ethics are increasingly recognized by conservation practitioners such as NGOs (e.g. [IIED](#), [WCS 2009](#)), many of these organizations do not yet have institutional structures in place to review research that involves people. Considering the deficit of ethical reporting we found in articles from authors based in academic institutions where IRB is the norm, we find this concerning.

Recent research suggests that early career conservation scientists receive little, if any, mandatory training in the philosophy or ethics of conservation and research (Saltz et al. 2018). Unlike research that involves animals (Costello et al. 2016), few guidelines exist specifically addressing the unique ethical challenges of conducting research with human subjects in conservation. As interdisciplinarity grows and social science becomes further ingrained in the fabric of conservation research, conservationists must be provided with adequate ethical training to ensure they recognize ethical issues and are properly equipped to

negotiate them. Furthermore, as a discipline, conservation science should strive to develop a Code of Ethics for human research, this should seek to promote good ethical practice, and provide guidance to researchers on how to navigate the complex contexts in which conservation research is conducted. Adhering to rigorous ethical standards should be viewed as an investment that not only strengthens research practice and integrity, but secures greater engagement and buy-in of participants.

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Tables

Table 1. Journals’ human research ethics reporting requirements (n=57)

	No. of journals	% of all journals
Researchers should include an ethics statement in the manuscript	19	33%
Researchers should follow an ethical code of conduct	16	28%
Research should be approved by an IRB	13	23%
Researchers should seek informed consent from participants	12	21%
All four of the above mentioned	6	11%

Information journals' required authors to include in their Ethics Statement

Statement should include name &/or reference number of IRB	12	21%
Statement should identify whether informed consent was sought	10	19%
Statement should identify whether code of conduct was followed	8	14%
All three of the above required	4	7%

Where journals' stipulate Ethics Statement should be located in manuscript

Methods	5	9%
Separate 'Ethics section'	5	9%
Before the References	2	4%
Unspecified	7	12%

Table 2. % of articles that meet journals' reporting requirements for human research ethics

Journals' ethics reporting requirement	No. articles published in journal with requirement	No. of articles that met requirements
Authors should consider ethical safeguards during research	122 (66%)	71 (58%)
Article should identify if research was approved by IRB	69 (37%)	12 (17%)
Article should identify the IRB that approved research	69 (37%)	6 (9%)
Article should identify whether code of conduct was followed	35 (19%)	2 (6%)
Article should identify whether informed consent was sought	31 (16%)	17 (46%)

Table 3. Types of ethical safeguards documented in articles (n=185).

IRB approval	Consent	Anonymity/ confidentiality	Code of conduct	No. of articles
✓	✓	✓	✓	1 (<1%)
✓	✓	-	✓	1 (<1%)
-	✓	✓	✓	3 (2%)
-	✓	-	✓	3 (2%)
✓	-	-	-	8 (4%)
-	-	✓	-	12 (6%)
✓	✓	-	-	12 (6%)
✓	✓	✓	-	13 (7%)
-	✓	✓	-	22 (12%)
-	✓	-	-	26 (14%)
No ethical considerations documented				84 (45%)
35 (19%)	81 (44%)	51 (28%)	8 (4%)	55%

Table 4. Ways in which the consent process was described in studies (n=81)

What types of consent were reported?

Free, Prior & Informed Consent	5 (6%)
Information given to participant before consent sought (Informed consent)	19 (24%)
Respondents participated voluntarily (Free consent)	16 (20%)
Consent was both Free & Informed	31 (39%)
No additional information provided	10 (12%)

Table 5. Research sensitivity and types of ethical safeguards authors described implementing

Hunting Status	Illegal / Conditional	Legal	Unknown	Total
Total number of articles	129 (70%)	24 (13%)	32 (17%)	185 (100%)
Articles that report ethics	79 (61%)	7 (29%)	15 (47%)	101 (55%)
Ethical consideration reported:				
Consent	62 (48%)	6 (25%)	13 (41%)	81 (44%)
Confidentiality &/or anonymity assured	48 (37%)	1 (4%)	2 (6%)	51 (28%)
IRB approval / reference	30 (23%)	1 (4%)	4 (13%)	35 (19%)
Code of conduct followed	6 (3%)	0 (0%)	2 (6%)	8 (4%)
All four considerations reported	1 (<1%)	0	0	1 (<1%)

Figure Legends

Figure 1. Countries where reviewed studies were conducted

Figure 2. Percentage of articles published that include research ethics, categorized by whether the journal had a human research ethics policy in place at the time of publication.

Figure 3. Percentage of hunting articles published each year that include ethical safeguards.

Figures with legends

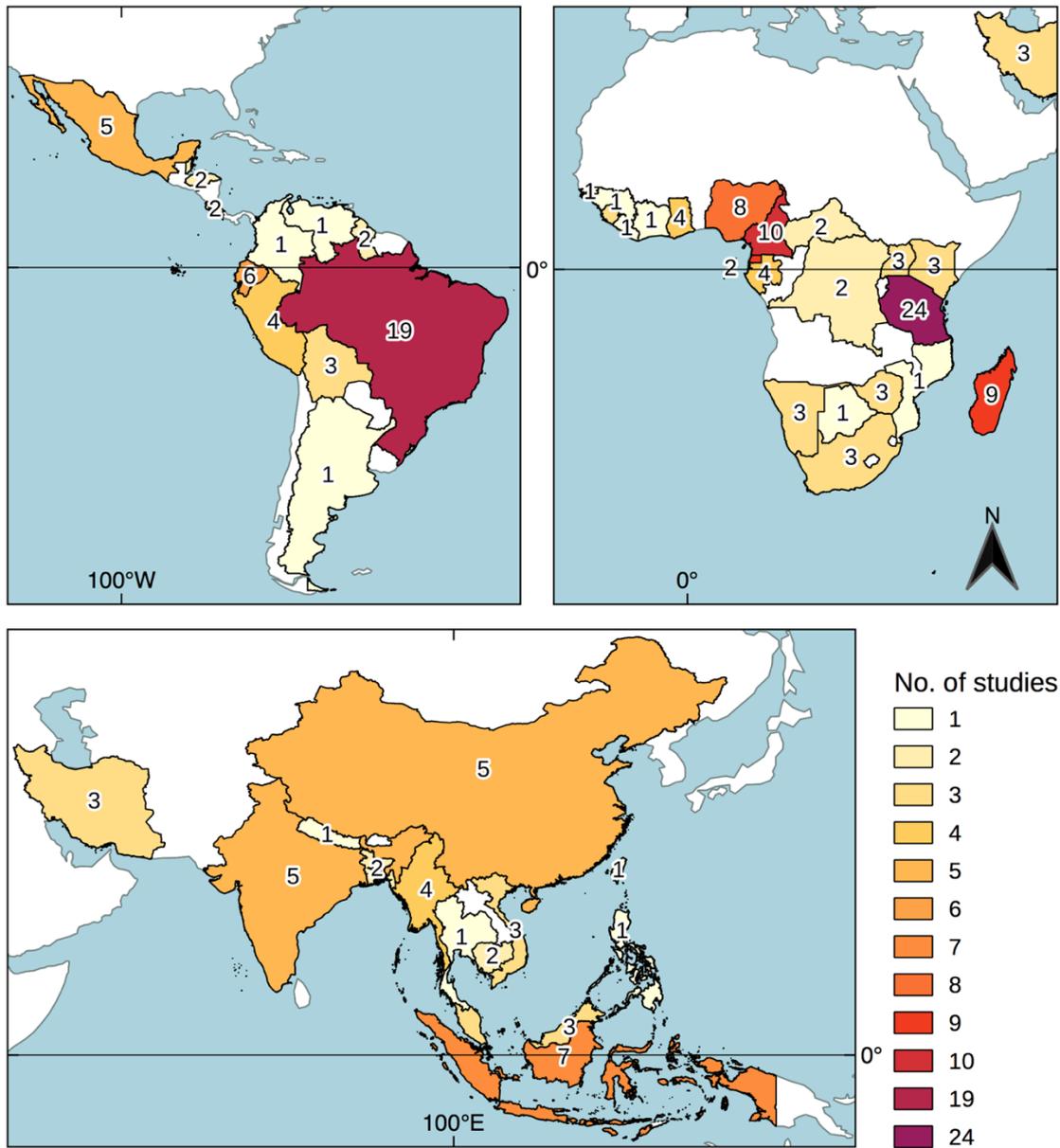


Figure 1. Countries where reviewed studies were conducted

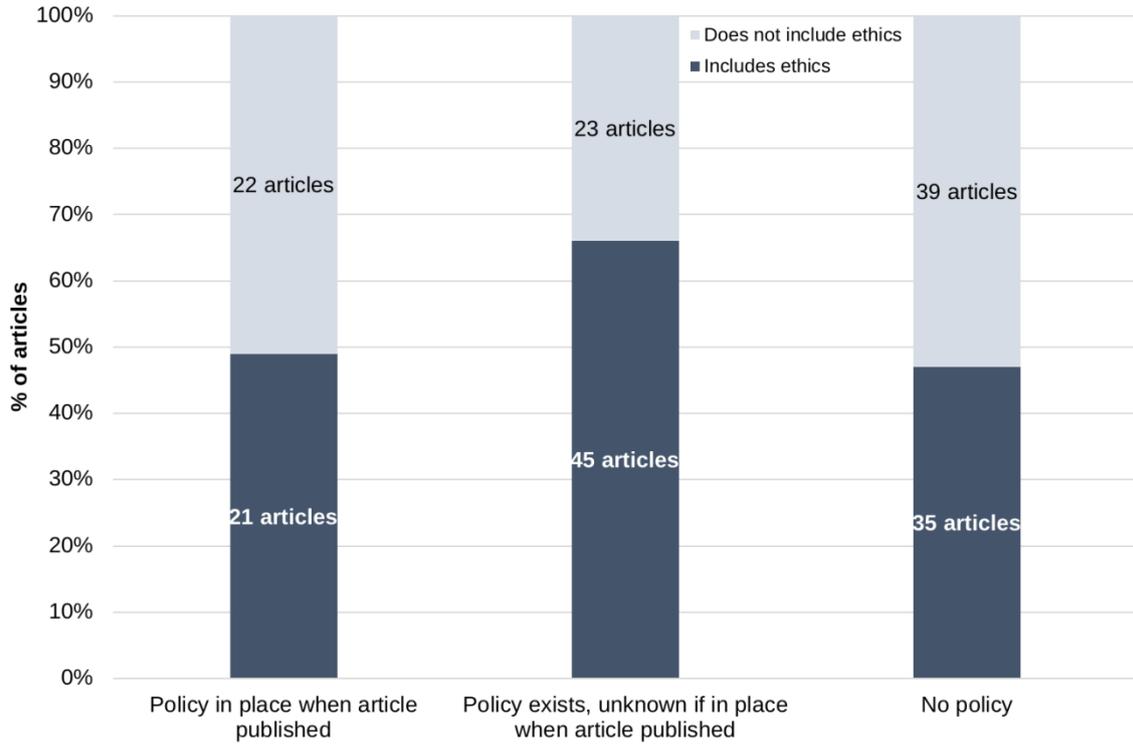


Figure 2. Percentage of articles published that include research ethics, categorized by whether the journal had a human research ethics policy in place at the time of publication.

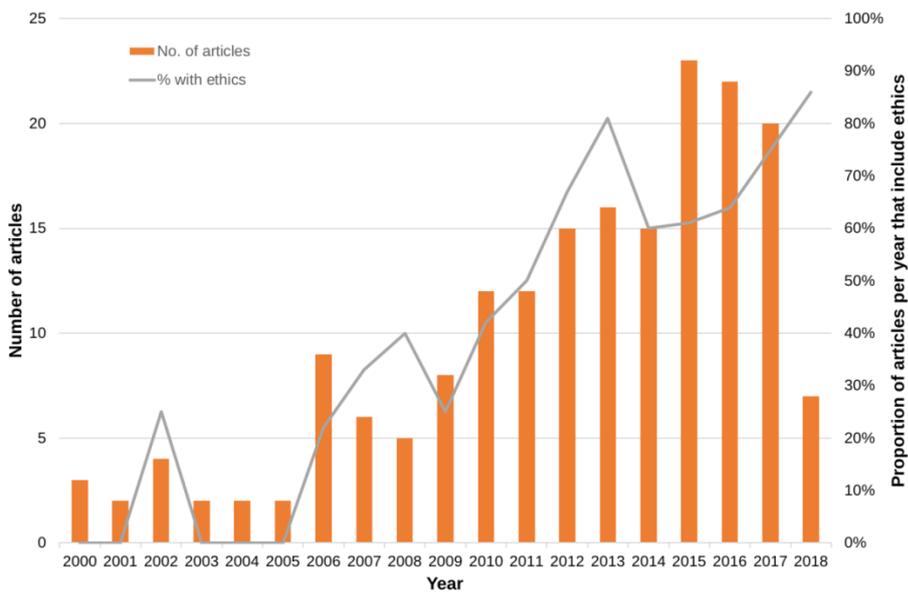


Figure 3. Percentage of hunting articles published each year that include ethical safeguards.