

REVIEW

Rediscovering the Potential of Indigenous Storytelling for Conservation Practice

Álvaro Fernández-Llamazares  & Mar Cabeza

Metapopulation Research Centre (MRC), Department of Biosciences, University of Helsinki, Finland

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Correspondence

Álvaro Fernández-Llamazares, Department of Biosciences, P.O. Box 65 (Viikinkari 1), FI-00014 University of Helsinki, Helsinki, Finland. Tel: +358 407482588; fax: +358 919157694. E-mail: alvaro.fernandez-llamazares@helsinki.fi

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Abstract

Several intergovernmental policy instruments, including the World Heritage Convention of UNESCO and the Convention on Biological Diversity, have proposed to develop integrated strategies to build bridges between biological and cultural diversity agendas. We contend that to succeed in this endeavor, it is crucial to link biocultural revitalization to conservation practice. Our hope with this review is to call attention to indigenous storytelling as an option worth adding to the repertoire of conservation practitioners who aim to: (1) link conservation actions to indigenous worldviews; (2) foster connections between indigenous peoples and their landscapes; (3) facilitate intergenerational transfer of indigenous knowledge; (4) support dialogue over conservation; and (5) promote local participation in conservation. Because indigenous stories are full of resonance, memory, and wisdom—in a footing that is structurally free of power imbalance between conservation practitioners and local communities—we contend that they can be crucial to guide future efforts in biocultural conservation practice. Our review shows that deeper consideration and promotion of indigenous storytelling can lead to enhanced understanding of diverse values and perceptions around biodiversity, while offering a constructive approach for greater inclusion of indigenous peoples in conservation pursuits.

Introduction

Just as the biosphere is being severely eroded by global change, so too is the ethnosphere, probably at greater rates (Gavin *et al.* 2015). Indeed, researchers argue that the losses of biological and cultural diversity are inextricably linked and driven by the same threats (Pretty *et al.* 2009; Maffi & Woodley 2010). In response to this, several policy instruments are promoting biocultural approaches to conservation (Table 1). Advances in biocultural research highlight the importance of tapping into indigenous knowledge to guide conservation in indigenous lands (IPs; Mistry & Berardi 2016). The homelands of indigenous peoples (IPs) encompass 22% of the world's land surface, often in areas where biodiversity thrives (Maffi & Woodley 2010).

It has been argued that indigenous cultures should be fostered in order to better engage IPs in conservation (Fernández-Llamazares *et al.* 2015; Brondizio & Le

Tourneau 2016). A growing body of literature has recognized the role of indigenous storytelling in transmitting biocultural knowledge (Brown 2013; Herrmann *et al.* 2013). Indigenous stories have often been handed down over generations, through oral history, and are preserved as a collective experience, which is central to revitalize biocultural diversity (Packer *et al.* 2007; Ryan 2015). Yet, despite the evidence of this link, there is little attention to the potential applications of indigenous storytelling for bridging the gap between biocultural revitalization and nature conservation, helping to maintain an intergenerational memory, and connecting conservation discourses to local contexts through two-way dialogues.

Halting the trends of biocultural diversity loss requires reshaping the ontologies and epistemologies framing conservation (Green *et al.* 2015; Reid *et al.* 2016). There is currently a window of opportunity within conservation theory and practice to bring new tools to better engage IPs in conservation, for reasons of social justice and

Table 1 Glossary

Concept	Definition
Biocultural conservation	Conservation approaches or actions made in the service of sustaining the biophysical and sociocultural components of dynamic, interacting, and interdependent social-ecological systems (Gavin <i>et al.</i> 2015).
Cosmology	A way of explaining the origin, history, and evolution of the universe based on the belief system of a specific cultural tradition.
Epistemology	A particular way of knowing things and making sense of reality. For example, indigenous epistemologies often derive from teachings transmitted through storytelling, are rich in perceptual experiences (e.g., dreams and visions), and arise from the close interconnections between humans, spirits, and nature.
Ethnosphere	The variety of cultures, ethnic groups, languages, and traditions in the planet.
Folktale	Story forming part of a particular cultural tradition, generally circulated orally and often taking on the characteristics of the time and place in which it is told. Folktales speak to universal and timeless topics, and are not necessarily based on “real” facts—in contrast to myths and legends—.
Local Environmental Knowledge	A cumulative body of knowledge, practice, and belief, evolving by adaptive processes and handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment (Berkes <i>et al.</i> 2000).
Ontology	The understanding or belief of what constitutes reality, what exists and what does not. Shared cultural ontologies result in a framework of ideas and beliefs through which a cultural group interprets the world (i.e., worldview).
Storytelling	Art of using words and actions to reveal the elements and images of a story while encouraging the listener’s imagination.

more inclusive biodiversity governance (Brondizio & Le Tourneau 2016). In this context, indigenous storytelling has been invoked as a potential vehicle to promote local participation in conservation initiatives and address the power asymmetries that have often hampered collaboration with IPs (De Groot & Zwaal 2007). More specifically, the development of community-centered projects in relation to indigenous storytelling, based on Free, Prior and Informed Consent (FPIC), embracing IPs as agents of action and explicitly recognizing indigenous rights and institutions, holds promise in opening new frontiers in biocultural conservation.

In this review, we explore the potential of indigenous storytelling to guide efforts aimed at revitalizing biocultural heritage. To meet this purpose, we first describe the main characteristics of indigenous storytelling. Second, we review several reasons why indigenous storytelling could help to incorporate the cultural dimensions of biodiversity into conservation practice and support discussion of collaboration, comanagement and power-sharing around conservation initiatives. Third, we present different examples of the use of indigenous storytelling in conservation. Fourth, we list several challenges that these approaches might face, as well as potential collisions with conservation institutions. Finally, we outline guiding principles to effectively link indigenous storytelling to conservation, also discussing some ethical implications that need consideration, with emphasis on the importance of respecting the intellectual property rights of IPs, as well as the customary mechanisms of community

control, ownership, and transmission of indigenous stories. We also provide a Glossary clarifying some concepts (Table 1).

Defining indigenous storytelling

Oral storytelling is a valuable form of human expression probably as old as humankind itself. Humans have a universal capacity to create and transmit oral stories, which has most likely served an evolutionary purpose (Boyd 2009). The fact that we experience pleasant feelings while listening to stories, through the release of dopamine in our brains, suggests that our bodies have evolved incentives for storytelling (Boyd 2009; Brown 2013).

Storytelling among IPs helps to forge a number of purposes, such as entertaining, passing down a repertoire of culturally built knowledge, maintaining a sense of community, and instilling moral values, all of which laid the groundwork for social collaboration (Nabokov 2006; Lawrence & Paige 2016). A key feature of indigenous storytelling is the intergenerational transmission of experience, allowing for human adaptation to different environments (Brown 2013; Egeland *et al.* 2013). Indigenous stories are made up of extremely complex, finely coded information on human subsistence and infused with dramatic elements that ensure their transmission, engaging the heart with the mind (MacDonald 1998; Archibald 2008).

Indigenous stories are as diverse as the locations and IPs they emanate from; yet, they share several commonalities that have given rise to the use of indigenous storytelling as a distinct term (e.g., Archibald 2008). For example, a common feature of indigenous stories is that communication with nature is a fact of life (Nanson 2011). By the same token, indigenous stories focus on holistic understandings of the whole (MacDonald 1998). Similarly, numerous scholars have argued that a common feature of indigenous stories, in contrast to other forms of oral history, is that they are always interactive (Silko 1981; De Groot & Zwaal 2007). The responses of the listeners influence the telling of the story, which emerges from coordinated efforts of teller and audience (Eder 2007). Such cooperative interaction partly explains the dynamic nature of indigenous stories, continually adapting to new sociocultural scenarios (Fernández-Llamazares *et al.* 2017). Given these commonalities and considering that Western worldviews have long dominated the conservation agenda, it seems reasonable to speak about indigenous storytelling in a broader sense when guiding biocultural conservation efforts. However, we acknowledge that indigenous storytelling encompasses myriads of worldviews and epistemologies, which are shaped by diverse cultural contexts.

Linking indigenous storytelling and conservation practice

Here, we define five avenues in which conservation practitioners could benefit from the inclusion of indigenous storytelling into their programs (Figure 1).

Recognize indigenous worldviews

Several conservation programs have faced mistrust amongst IPs (Reid *et al.* 2016). Although the debate is broad, one of the causes for such skepticism is arguably the little recognition of indigenous worldviews in conservation (Gavin *et al.* 2015). For example, by putting a commercial value on forests or mainly considering them as carbon sinks, the REDD+ program has been seen by some to neglect the cultural values of IPs. Such epistemological mismatch represents an obstacle for the engagement of IPs in conservation (Berkes 2009).

Indigenous stories, as an expression of local cultural values, beliefs and knowledge, reveal conceptualizations of nature-culture interrelations that differ from Western epistemologies. In general terms, indigenous stories often acknowledge the intrinsic values of nature, depict nature as being unaffected by Humanity, and transmit the idea of living landscapes with spiritual dimensions (Lewis &

Sheppard 2005; Brown 2013). We suggest that a greater attention to indigenous ontologies, as transmitted in stories, can contribute to make conservation programs more culturally sensitive, facilitating intercultural discussion.

Indigenous stories underlie local values in relation to ecosystems and biodiversity (De Groot & Zwaal 2007; Clark & Slocombe 2009). Symbolic dimensions of the local ecology in indigenous stories can illuminate several cognitive processes underpinning IPs' collective ideology of nature (Herrmann *et al.* 2013). As such, appraising sociocultural representations of nature through indigenous stories allows conservation practitioners to better understand traditional cosmological systems in relation to wildlife and landscapes, including cultural values attached to certain ecosystems (Lewis & Sheppard 2005).

Given that nature-culture interactions are inherently coevolutionary, research is addressing both how indigenous stories—and the traditional values therein—shape the way in which IPs manage biodiversity (Clark & Slocombe 2009) and how local wildlife changes are represented and integrated within the myths of different IPs (Fernández-Llamazares *et al.* 2017). Considering that the way IPs interpret nature can determine their behavior toward proposed conservation actions (Fernández-Llamazares *et al.* 2015), understanding its symbolic dimensions is of relevance to conservation.

Foster a sense of place

A characteristic feature of indigenous storytelling is that it engages creative imagination, embedding facts in values and beliefs (Archibald 2008). By integrating knowledge with feelings, indigenous stories offer a platform to establish emotional connections with the landscape, helping to cultivate a sense of place (Silko 1981; Nanson 2011). For instance, community-led research in the Arctic has shown that traditional legends play a critical role in sustaining the Inuit sense of home and identity (MacDonald 1998). This is interesting from a conservation point of view at this era of global dislocation of place-based identities (Porteous & Smith 2001).

IPs become rooted to places at the spiritual level through storytelling (Silko 1981; Lewis & Sheppard 2005). The spiritual meanings of places are largely handed down through stories and are at the basis of the indigenous sense of place (Nabokov 2006). Thus, understanding indigenous landscapes requires an understanding of their related stories. Several researchers have highlighted that conservation should take into consideration the spiritual significance of landscapes for IPs (Lewis & Sheppard 2005). Different studies have shown that indigenous spiritual values transmitted through storytelling influence not only human uses of biodiversity, but also

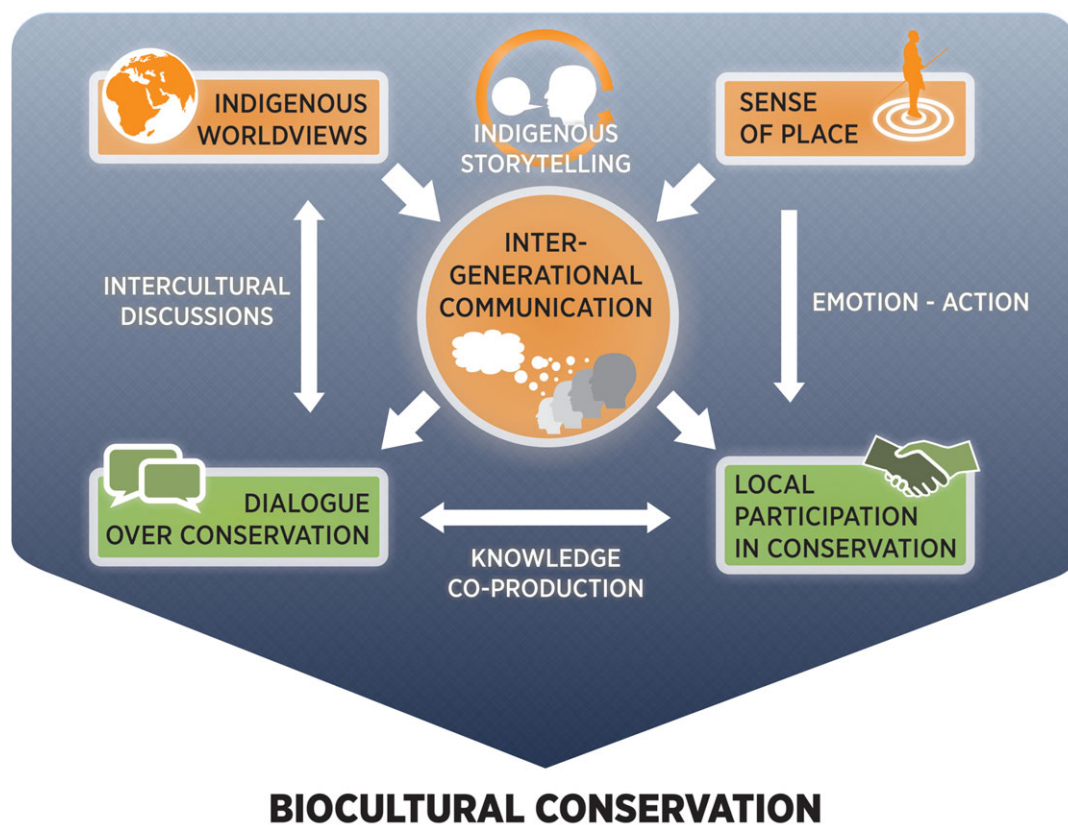


Figure 1 Conceptual model of the foundations for the incorporation of indigenous storytelling into biocultural conservation efforts. Aspects of indigenous cultures (in orange), such as *indigenous worldviews*, are reflected in stories, *fostering a sense of place* that is maintained through *intergenerational communication*. Initiatives that support storytelling thus support the recognition of indigenous cultural identities. Biodiversity conservation (in green) might be facilitated by indigenous storytelling through improved intercultural discussions, resulting in increased *dialogue over conservation* and *local participation in conservation* activities. Such synergistic framework supports the goals of biocultural conservation.

proactive conservation behavior (e.g., sacred sites; Singh *et al.* 2010). Yet, sacred sites are contingent upon continuous transmission of their spiritual values, a process that is being disrupted by cultural changes (Kandari *et al.* 2014). We argue that indigenous storytelling could help to revitalize spiritual values around nature.

Promote intergenerational communication

Indigenous storytelling is a critical social mechanism for the intergenerational transmission of biocultural knowledge (Clark & Slocombe 2009; Brown 2013). Here, it is important to recognize the institution of eldership in the process of indigenous storytelling (Iseke & Moore 2011; Egeland *et al.* 2013). Through the intergenerational memory transmitted by indigenous stories, elders ensure not only the continuance of indigenous epistemic traditions, but also the social memory of landscape (Davidson-Hunt & Berkes 2003).

Yet, there seems to be a disappearance of the traditional institutions that helped to transfer indigenous knowledge from generation to generation (Papworth *et al.* 2009; Kandari *et al.* 2014). This is often attributed to declining interactions between elders and young generations (Singh *et al.* 2010), resulting in disconnection with the landscape. Evidence of shifting baselines among IPs (Fernández-Llamazares *et al.* 2015) indicates changing human perceptions of ecosystems due to loss of experience about past conditions. If old generations do not tell younger generations how ecosystems resembled in the past, ecological changes remain unnoticed to younger generations. Such phenomenon poses a threat to conservation, because the failure to recognize ecological changes usually translates into unsustainable uses of biodiversity and/or decreased support for conservation (Papworth *et al.* 2009). The risk of shifting baselines calls for developing programs aimed at facilitating intergenerational transfer of knowledge (Maffi & Woodley 2010). In

this context, storytelling has been proposed as a powerful means for establishing narratives of ecosystem change and strengthening networks of cultural transmission.

Support dialogue over conservation

We know that IPs generally base their management actions on systems of knowledge other than science (Fernández-Llamazares *et al.* 2016). Yet, conservation practitioners usually rely on scientific knowledge for their outreach strategies. This mismatch has implications for successful dialogue between practitioners and IPs. In the meantime, including indigenous worldviews into conservation can provide a more inclusive approach to knowledge coproduction (Reid *et al.* 2016). Indigenous stories often reflect areas of cultural importance, thus offering opportunities for tailoring conservation to local contexts (Nabokov 2006; Singh *et al.* 2010). Moreover, understanding indigenous worldviews can help to improve conservation communication strategies. Precisely because indigenous storytelling is a cultural expression of the social-ecological context, it can help to promote dialogue over conservation (Janif *et al.* 2016).

The interactive nature of indigenous storytelling can facilitate dialogue between IPs and conservation practitioners, through creative exploration and collective reflection. Indeed, indigenous storytelling is a powerful medium to elicit debates in local communities (De Groot & Zwaal 2007). Debate usually spurs spontaneously after the telling of the stories. Sometimes, storytellers invite the audience to interpret the stories through questions (Hodge *et al.* 2002). Indigenous stories are generally open-ended, allowing listeners to initiate free discussion (Eder 2007). Local meetings aimed at sharing stories usually provide a forum for IPs to discuss solutions to local management issues, based on the philosophical guidance of the stories (Egeland *et al.* 2013).

In this context, promoting indigenous storytelling should be viewed as a pathway for restoring spaces of community-building. The creativity and spontaneity that the process of storytelling entails allow participants to raise delicate issues with a greater degree of freedom than other participative methods. For instance, focus groups are generally more structured than indigenous storytelling sessions, where the question-answer format becomes neutralized and the power relations less apparent. In a storytelling session, the stories told and the topics under discussion are decided multilaterally, whereas in a focus group, the direction of the conversation is usually guided by the needs and agenda of the practitioner. Although focus groups are usually more manageable for a practitioner—given that there are exploratory questions to facilitate a discussion confined

to certain topics—, storytelling might arguably allow for a more relaxed and genuine conversation on topics eventually lying beyond the practitioner's control.

Promote local participation in conservation

The creation of inclusive platforms bringing together IPs and conservation practitioners is regarded as a major component in attempts to foster community-based management of natural resources (Reid *et al.* 2016). Yet, efforts to ensure coparticipation in conservation decision making have remained largely rhetorical.

Innovative theater-based participatory methods are starting in order to emerge to engage local communities in conservation (Osnes 2013). The reason for this growing acceptance of art-based techniques may be found in the limitations of traditional scientific methods in integrating knowledge with emotion and action (Heras & Tàbara 2014). In this line, “conservation theater”—participatory theater in which locals share their perspectives on conservation—has shown success in engaging local communities in conservation (Heras & Tàbara 2016). We believe that indigenous storytelling can supply similar functions, helping to supplement cognitive registers with emotional ones and stimulating interest in conservation.

Moreover, storytelling projects have also the potential to foster trust between IPs and conservation practitioners. Indigenous storytelling can be a departure point for creating a collaborative learning culture. Listening to indigenous stories is a humbling experience, which implies actively listening to, and learning from, the wisdom of IPs. Precisely, IPs have repeatedly expressed that humility—from the side of practitioners—is a critical trait needed to work jointly for conservation (Reid *et al.* 2016).

Examples of the use of indigenous storytelling in conservation

We present five examples of projects using storytelling to guide innovative approaches in biocultural conservation. Although the objectives of the projects highlighted are multifaceted, each of them corresponds closely to one of the five avenues described in the previous section (see Figure 1). While the three first projects have an outreach orientation, the two last examples illustrate the use of storytelling as a vehicle for fostering dialogue and participation of IPs in conservation.

Our first example describes a project recognizing *indigenous worldviews* in the Pilón Lajas Biosphere Reserve and Indigenous Territory (Bolivia), a comanaged protected area whose visitor center hosted an exhibition disseminating the traditional myths of the Tsimane' IPs living in the reserve. While the idea of the exhibition emerged

from the side of conservation authorities, all its contents were collaboratively convened with the local communities through FPIC and an extensive consultation strategy with village leaders and elders. Several Tsimane' myths were showcased in different displays exploring how such stories support conservation (e.g., transmission of taboos regulating hunting; Fernández-Llamazares *et al.* 2017). The exhibition served a purpose in publicly celebrating the biocultural heritage of the Tsimane', while also emphasizing points of encounter between conservation regulations and Tsimane' cultural practices.

Our second example describes a project using storytelling for *fostering a sense of place* in Ranomafana National Park (Madagascar). Funded by IUCN, the project entitled *Echoes of the Forest (Akon' ny ala)* aims to make a 10-episode radio series weaving scientific perspectives about lemur conservation with the cultural fabric of the local Betsileo and Tanala communities living around the park. Using a variety of traditional storytelling formats, the project promotes local pride for lemurs as well as emotional connections with the forest. The local enthusiasm around the project has also led to the formulation of a community-led radio governing body with the goal of connecting the local communities to conservation challenges in culturally appropriate manners.

Our third example describes a project applying indigenous stories to encourage *intergenerational communication* about wildlife in Sibiloi National Park (Kenya). This project, coordinated by the University of Helsinki, is assisting local young Daasanach to document traditional wildlife stories from their elders. This initiative is helping to restore the traditional knowledge about wildlife of younger generations, while they listen to the elders tell stories, exposing also the children, for the first time, to stories that are being lost (see Figure 2). The recorded stories are being transcribed with the goal of being used as school materials, with the hope of enhancing biocultural self-esteem. So far, the project has documented 48 folktales about wildlife through a participatory research methodology involving elders, youth, and children.

Our fourth example draws on the work by De Groot & Zwaal (2007) reporting how storytelling in Waza National Park (Cameroon) helped to support *dialogue over conservation* between practitioners and local communities. In their study, the authors document how storytelling sessions helped to create deliberative spaces for discussion of conservation issues with local communities in a substantively open manner. Entering this medium, conservation practitioners became simple participants, thus reducing the power differences in the interactions between conservation and IPs.

Finally, we highlight a storytelling project promoting *local participation in conservation* in the Sierra Nevada

Mountain Range (US). Through radio broadcasts, storytelling workshops, a mobile storybooth and an interactive website, the project "*Saving the Sierra: Voices of Conservation in Action*" is set to document community efforts to conserve nature. Engaging IPs, academics, ranchers and conservation practitioners, the project hopes to inspire people to come together to find local solutions to conservation issues, while honoring the stories and traditions of the local communities.

Challenges and limitations

Despite the benefits that indigenous storytelling could bring to conservation, there are also limitations and challenges that need consideration.

First, indigenous stories can transmit cultural values that are a priori inconsistent with conservation efforts, e.g., stories about hunting certain animals to gain cultural prestige (Dickman *et al.* 2015). Although the use of these stories to promote conservation is far from ideal, they should not be seen as an anathema to conservation, but rather as an opportunity to achieve nuanced understanding of culturally rooted dimensions of wildlife, in order to design conservation strategies accordingly. For example, Goldman *et al.* (2013) showed that Maasai stories about lion hunting are crucial to understand the relation of the Maasai with lions, because they underlie their actual appreciation of, and connection to this animal. However, on the basis of moral relativism, some authors have argued that it is valid to promote cultural change in the interests of biodiversity conservation (Dickman *et al.* 2015). Although the debate falls beyond the scope of this article, our argument here is that stories about cultural uses of wildlife should not be dismissed or altered, but rather understood in their evolving cultural context as legitimate cultural expressions of IPs. Whether or not each story has potential to inform conservation is open to scrutiny and is subject to contextual factors, but there is no doubt that there is ground for embracing the cultural values of wildlife, as transmitted in stories, in conservation practice. This sits well within the broader debate about customary sustainable use of wildlife in protected areas (see Sasaoka & Laumonier 2012). We contend that indigenous stories can contribute to a refined understanding of indigenous territories as multifunctional "cultural landscapes" with a number of cultural ecosystem services that are central to biodiversity governance (Pert *et al.* 2015).

Second, indigenous stories can be a pathway for the transmission of culturally developed prejudice toward certain species. For example, animosity toward Hyaenidae is ingrained in many African oral traditions (Biedelman 1975). De Pinho *et al.* (2014) described that, because of the culturally transmitted view of Hyaenidae



Figure 2 A Daasanach elderly woman records a traditional folktale in a storytelling session with young generations, as part of a participatory project aiming to revitalize traditional stories about wildlife in the surroundings of Sibiloi National Park, North Kenya. Photography: Joan de la Malla.

as despicable animals, Maasai people fail to see incentives for their conservation. However, in other cases, the entrenched antipathy toward certain species can paradoxically lead to desirable conservation outcomes, e.g., stories in southwest Asia transmitting the belief that harming Chiroptera would carry bad luck (Frembgen 2006). Although opportunistically exploiting these stories in the interests of wildlife is inadvisable (Dickman *et al.* 2015), conservation practitioners should be aware that indigenous stories shape both local attitudes and traditional institutions for biodiversity governance.

In view of this, it is important to complement the listening of stories with deep and continuous engagements with IPs. Indigenous stories can provide a broad overview of local attitudes toward wildlife and insights into the mechanisms by which local attitudes are developed. However, deducing rules or the ideological models of a society only from stories can lead to a skewed vision of nature-culture interactions, given that stories exist on a different level of reality from social behavior (Biedelman 1975). Indigenous stories provide detailed examples from which conservation practitioners can elucidate new

dimensions, to later be further explored through open dialogue with IPs.

Guiding principles for conservation practitioners and ethical implications

To facilitate moving from rhetoric to practice, we unfold here a number of guidelines for conservation practitioners, starting with examples of what can practitioners do to support indigenous storytelling and ending with ethical considerations to guide these efforts accounting for the aforementioned challenges.

What can conservation practitioners do to support indigenous storytelling?

Many indigenous stories have been made accessible through the documentation efforts of numerous folklorists over the last century. Although the exploration of book-sourced indigenous stories could be useful, in certain contexts and under certain circumstances, for conservation practitioners wishing to better understand

the local contexts where conservation is set to occur, we strongly advise to exercise caution when examining these written records for two reasons. First, a non-negligible share of these documentation efforts has been undertaken through ethnocentric paradigms, colonizing methodologies, and exploitative research practices (Tuhiwai Smith 1999). Indeed, many indigenous stories have been made accessible without the FPIC of IPs, falling short in embracing them as agents of action (AIATSIS 2015). Second, many of these sources offer flagrant misrepresentations of indigenous cultures (Sium & Ritskes 2013). Although excellent examples of community-led documentation of indigenous stories do exist (e.g., MacDonald 1998; Iseke & Moore 2011), we call for conservation practitioners to be aware of the mistakes of ethnography in service of the power (Tuhiwai Smith 1999) and channel their efforts into novel approaches challenging the access mentality concomitant to colonial scholarship.

For example, conservation practitioners are encouraged to pay tribute to indigenous storytelling by visiting local communities and listening to their stories in situ (Figure 3). Considering the colonial legacy of conservation, showing humble interest on indigenous stories could be a first springboard for reconciliation and mindful collaboration with IPs. Yet, knowing that the bonds between nature and IPs are loosening in many places (Maffi & Woodley 2010), conservation practitioners should also take active measures to enhance the biocultural heritage of IPs.

Along these lines, documenting indigenous stories has been proposed as an effective means to ensure their maintenance (Iseke & Moore 2011; Ryan 2015). Such form of *ex situ* cultural conservation seeks to record stories and store them in different formats, in order to make them available to the local and/or global community, as well as helping to raise awareness about their value (McCarter *et al.* 2014). However, such programs have faced criticism for different reasons. Cultural preservation of indigenous stories often risks distilling indigenous stories into noncontextual forms deprived of their local meaning (Gómez-Baggethun & Reyes-García 2013). Moreover, it also raises deep questions about intellectual property rights. Many records of indigenous stories are not publicly available or in accessible forms, and sometimes, IPs themselves cannot access them due to privacy laws (AIATSIS 2015). To overcome such shortcomings, community-based participatory approaches are being developed to uphold indigenous stories from the bottom-up, placing control for the documentation of the stories in the hands of IPs (Packer *et al.* 2007; Ryan 2015).

Nevertheless, it is important to note that preserving stories in books does not completely guarantee their transmission. It is only through the direct interaction be-

tween storyteller and audience that indigenous stories are kept alive. In this context, documentation efforts should ideally be accompanied by *in situ* approaches seeking to revitalize biocultural heritage within the local communities. For instance, several indigenous storytelling festivals (see Table S1) have shown significant success in supporting transmission of indigenous stories. Conservation practitioners could join efforts with these initiatives and help to sponsor storytelling events (e.g., World Storytelling Day). The offices and headquarters of some of the world's protected area organizations could become a symbolic stage to share the stories of IPs and educate the general public about biocultural conservation.

We caution practitioners to pay particular attention to language barriers and cultural differences, when engaging with IPs in storytelling projects. Practitioners are expected to employ indigenous languages to the degree possible, which may involve language fluency or the employment of interpreters. The importance of careful translation should be emphasized as a requisite for successful communication. However, even when language is well-translated, indigenous stories might not necessarily make sense to the listener, e.g., due to differences in symbols. We note that the identification of such communication gaps is equally important, highlighting different worldviews and philosophies.

How could conservation practitioners account for ethical considerations?

Examples of questionable social and environmental outcomes of top-down conservation policies in areas inhabited by IPs abound (Brockington & Igoe 2006; Kohler & Brondizio 2016). To engage in conservation projects, IPs have often had to accept Western assumptions about ecology, and learn ways of thinking that undermine their own epistemological traditions (Fernández-Giménez *et al.* 2006; Watson 2013). Sometimes, conservation projects, far from being empowering, threaten the very fabric of how IPs relate to their local ecologies (Mistry & Berardi 2016). For example, Nadasdy (2003) documents how the Kluane peoples of northern Canada have had to develop bureaucratic behaviors and institutions modeled after the state in order to participate in wildlife comanagement. This illustrates that even well-intentioned programs aiming to revitalize indigenous stories can become a vector for cultural change by translating indigenous stories in certain ways which can lead to perpetuating unequal power relations and disenfranchisement of IPs. In view of this, we advocate for taking proactive, precautionary actions to protect the cultural integrity of IPs and their stories. Any conservation action aiming to promote biocultural revitalization should critically examine whose



Figure 3 Students of conservation science listen to local stories to understand the context and challenges of conservation in the vicinity of Ranomafana National Park, Madagascar. Photography: Joan de la Malla.

interests are advanced with the stories being revitalized, while also explicitly avoiding knowledge imposition and colonizing methodologies (Tuhivai Smith 1999; Pert *et al.* 2015). Here, we provide several guidelines that can help to nurture the conditions of trust and social equity needed for these projects to be legitimate and sensitive to the issue of assimilative practices of knowledge integration (*sensu* Nadasdy 2003).

Prior to entering relationship with IPs, conservation practitioners should develop understanding of the local community, including laws, customs, institutions, and governance systems (see Newing 2011). Most importantly, FPIC must be established prior to undertaking any projects in relation to indigenous storytelling (ISE 2006). The identification of common interests and the negotiation of coresearch agreements outlining a mutually agreed-upon working agenda are critical to ensure that local communities steer the process (Pert *et al.* 2015). Showing deep respect for the cultural integrity and spirituality of these stories is central to any effort on this direction. Within the Convention on Biological Diversity, there are several indigenous-led codes of ethical conduct providing a collaborative framework to

ensure full involvement of IPs in conservation while respecting their cultural and intellectual heritage (e.g., Akwe: Kon Guidelines and The Tkarihwaié:ri Code of Ethical Conduct; CBD 2004 2011).

Participatory approaches to gather stories should always support the efforts of IPs in undertaking their own documentation based on their epistemologies and needs. This should include a responsibility to avoid the imposition of inappropriate external standards promoting colonizing methodologies. It is thus essential to explicitly address power imbalances through the development of community-centered and mutually negotiated agreements with the legitimate community governance structures, meeting the standards for ethical engagement with IPs (Reid *et al.* 2016). In cases where the traditional institutions of IPs have been weakened or do not exist as agencies, efforts should be placed in rebuilding these institutions internally, before any documentation is set to take place.

Projects aimed at making publicly available indigenous stories (Packer *et al.* 2007) should always count with the permission of IPs and should respect the purposes and integrity of the stories collected. This inevitably

raises ethical concerns that should be dealt with through continuous, mindful and two-way dialogue. Moreover, it is crucial to recognize that IPs are entitled to share in and benefit from both tangible and intangible processes in relation to the stories being gathered (e.g., practical guidelines for ethical publishing with IPs; AIATSIS 2015). Moreover, caution is called when working with stories in relation to sacred and/or secret knowledge, given the potential for misappropriation and misrepresentation of cultural values, and provocation of cultural sensitivities. It is essential that any action aimed at revitalizing indigenous storytelling complies with local systems for management of knowledge and respects the customary mechanisms of community control, ownership, and transmission of indigenous stories (ISE 2006). Conservation practitioners should respect the internal mechanisms guiding the telling of the stories and refrain from granting any access to indigenous stories not intended to be communicated to outsiders. Only stories that IPs themselves consent to share publicly should be made available, making sure that IPs count with complete information in an understandable form of all foreseeable benefits and risks related to the transmission of the stories.

There are several indigenous storytellers' associations that can advise conservation practitioners on how to develop storytelling projects respecting the local institutions, as well as intellectual property rights. For example, the Turtle Island Storytellers Network in the Northern Plains (US) provides opportunities for organizations wishing to work collaboratively with tribal storytellers. They have recorded and preserved many traditional stories which they distribute through radio programs. Some associations (e.g., Indian Storytelling Association, Manitoba Storytelling Guild) also organize workshops aimed at developing collaborative storytelling projects between IPs and practitioners. Similarly, both the Society for Conservation Biology and the International Society of Ethnobiology have developed workshops and conferences on storytelling in relation to conservation. There are also trainings for scientists on storytelling techniques at the IUCN Communication Training Program, which could be easily streamed to projects targeting indigenous storytelling for conservation. With the appropriate approaches, as well as growing evidence of its value, we believe that the use of indigenous storytelling will become a major trend in future biocultural conservation approaches.

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Supporting Information

Additional Supporting Information may be found in the online version of this article at the publisher's web site:

Table S1. Selection of indigenous storytelling festivals around the world

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