

What does it mean to be *for a Place*?

Stephanie B. Borrelle, Jonathan B. Koch, Caitlin McDonough MacKenzie,
Kurt E. Ingeman, Bonnie M. McGill, Max R. Lambert, Anat M. Belasen,
Joan Dudney, Charlotte H. Chang, Amy K. Teffer and Grace C. Wu

<https://doi.org/10.1071/PC20015>

Since online publication of this manuscript, we have been informed by Dr K. Crocker that relevant comments related to Indigenous knowledge and conservation presented in their social media profile were neither cited nor acknowledged. We would also like to reference a workshop we attended on designing community-engaged research projects led by M. Heyza and Dr R. K. Tonietto. We regret overlooking this material and thank these authors for their time, patience, and thoughtfulness in corresponding with us.

The material in question is:

Crocker, K. [@cricketcrocker]. 2018 (September 8). *I wish conservation biologists would build their field using indigenous (to whatever area) knowledge. It's exhausting, as a Native scientist, to watch colonialist framings constantly set up unjust precedents and then subtly (or not) blame non-scientists for issues.* Twitter. <https://twitter.com/cricketcrocker/status/1038396422624821248>.

Crocker, K. [@cricketcrocker]. 2019 (March 6). *Hey academics. Are you doing land acknowledgments at the beginning of your talks? If not, start doing it. Native-land.ca.* Twitter. <https://twitter.com/cricketcrocker/status/1103428260774506496>.

Heyza, M. and Tonietto, R.K. 2019. Designing equitable community-engaged research projects. Workshop. Volcano, HI. October 29.

Crocker (2018) is relevant to the discussion of how contemporary conservation efforts continue to displace Indigenous sovereignty and perpetuate neo-colonialism. Crocker (2019) is relevant to the discussion of the importance of acknowledging people who have genealogical connections to the land, and their ancestors past, present, and future.

In the section “Show up. Listen. Keep an open mind and an open heart” Extending to Practice paragraph, we have changed the second sentence from:

Arrive at meetings with Indigenous partners with a ‘blank page’ – look to them to set priorities rather than arriving with predetermined priorities and strategies.

to:

Approach collaborations with an open mind rather than a predetermined agenda and research questions (Heyza and Tonietto 2019).

Heyza and Tonietto (2019) is relevant to the discussion of extending conservation practice to co-develop research questions and methods with communities, and we cite these out of respect for the concerns expressed by the cited authors.

We acknowledge that subsequent to the submission of the first version of our paper on 6th February 2020, Dr Crocker tweeted:

Crocker, K. [@cricketcrocker]. 2020 (February 12). *Why do restoration ecologists never talk about or to people whose management and culture maintained the “original” ecosystems? If your restoration ecology isn't centered on indigenous empowerment, is it really restorative?*

Twitter. <https://twitter.com/cricketcrocker/status/122779905255901593>.

This tweet is also relevant to the two points raised above, namely that the discussion of how contemporary conservation efforts continues to displace Indigenous sovereignty and perpetuate neo-colonialism and that is important to acknowledge people who have genealogical connections to the land, and their ancestors past, present, and future.

Acknowledgements

Mahalo nui to Noelani Puniwai, Moana ‘Ulu” Ching, and the *kia'i* of Mauna Kea for welcoming us to Pu‘uhonua o Pu‘u huluhulu and teaching us about *aloha* ‘aina and Mauna Kea. We thank the Indigenous and non-Indigenous editors for the invitation to contribute our perspective to the important conversation about the challenges of cooperation between Indigenous and non-Indigenous people in this special issue. We acknowledge that intention does not equal impact, and hope that this paper continues to provide actionable information and an open dialogue on allyship in the conservation space.

The authors recognise the value of knowledge that exists outside of the written tradition and scientific record; we thank the keepers of traditional knowledge and recognise their influence on each of our journeys. MRL thanks Wisdom of the Elders and L. Guderyahn and colleagues at Portland Parks and Recreation for their teachings. We are grateful to M. Heyza and R. Tonietto for sharing their work on The Porch Project and their expertise working with communities in Flint, Michigan. We are grateful to all of our mentors, teachers and peers along this path, including T. Young, M. Bletz, M. Bogan, M. Dombek, and S. Foster. While writing this paper, SBB worked on the ancestral lands of the Huron-Wendat, Seneca, and Mississaugas of the Credit River, and Ngāti Paoa; JBK on the lands of

Kānaka ʻŌiwi; KEI on the lands of Kalapuya, Chinook, Cowlitz, and Kānaka ʻŌiwi; BMM on the lands of Dakota Sioux, Ioway, and Meskwaki; MRL on the lands of Ohlone and Clackamas; JD on the lands of the Western Mono (Monache), the Foothills Yokuts, and the Tubatulabal; AKT on the lands of Pocumtuc, Nipmuck, Abenaki/Abénaquis, Pennacook, Wabanaki Confederacy lands; GCW on the lands of the Chumash and Barbareño; CHC on the lands of the Tongva, Serrano, and Cahuilla, as well as the Tai Lü, Haqniq, Yi, Yao, Jinuo, and Lahu of Sipsong Panna. All authors are supported by the David H. Smith Conservation Research Fellowship. The authors declare no conflicts of interest.

What does it mean to be *for a Place*?

Stephanie B. Borrelle, Jonathan B. Koch, Caitlin McDonough MacKenzie, Kurt E. Ingeman, Bonnie M. McGill, Max R. Lambert, Anat M. Belasen, Joan Dudney, Charlotte H. Chang, Amy K. Teffer and Grace C. Wu

<https://doi.org/10.1071/PC20015>

Following discussions between the Editor-in-Chief, the corresponding author and two authors on the original paper, the authorship list for this paper has been revised to:

Stephanie B. Borrelle, Jonathan B. Koch, Kurt E. Ingeman, Bonnie M. McGill, Max R. Lambert, Joan Dudney, Charlotte H. Chang, Amy K. Teffer and Grace C. Wu

Caitlin McDonough MacKenzie and Anat M. Belasen have withdrawn their authorship because they believe they no longer meet the criteria under COPE guidelines to be authors on this manuscript.

What does it mean to be *for a Place*?

Stephanie B. Borrelle^{ID A,B,O,*}, Jonathan B. Koch^{A,C,*},
 Caitlin McDonough MacKenzie^{A,D}, Kurt E. Ingeman^{A,E}, Bonnie M. McGill^{A,F},
 Max R. Lambert^{A,G}, Anat M. Belasen^{A,H}, Joan Dudney^{A,I},
 Charlotte H. Chang^{A,J}, Amy K. Teffer^{A,K,L} and Grace C. Wu^{A,M,N}

^ADavid H. Smith Conservation Research Program, Society for Conservation Biology, Washington, DC, USA.

^BDepartment of Ecology and Evolutionary Biology, University of Toronto, St George, Ontario, Canada.

^CTropical Conservation Biology & Environmental Science, University of Hawai'i, Hilo, HI, USA.

^DClimate Change Institute, University of Maine, Orono, ME, USA.

^EEcology, Evolution, and Marine Biology Department, University of California, Santa Barbara, CA, USA.

^FAnthropocene Science Section, Carnegie Museum of Natural History, Pittsburgh, PA, USA.

^GDepartment of Environmental Science, Policy, and Management, University of California, Berkeley, CA, USA.

^HDepartment of Ecology and Evolutionary Biology, Cornell University, Ithaca, NY, USA.

^IDepartment of Plant Sciences, University of California, One Shields Avenue, Davis, CA 95616, USA.

^JDepartment of Biology and Environmental Analysis Program, Pomona College, Claremont, CA, USA.

^KDepartment of Environmental Conservation, University of Massachusetts, Amherst, MA, USA.

^LConte Anadromous Fish Research Laboratory, United States Geological Survey, Turners Falls, MA, USA.

^MThe Nature Conservancy, Minneapolis, MN, USA.

^NThe National Center for Ecological Analysis and Synthesis, Santa Barbara, CA, USA.

^OCorresponding author. Email: stephborrelle@gmail.com

Abstract. Indigenous knowledge is a multilayered knowledge system that can effectively manage global ecosystem and biodiversity conservation. Conservation is an applied discipline with the goal of preserving the world's biodiversity and ecosystems. However, settler–coloniser conservation practices often fail to fully examine how settler–coloniser epistemologies are centred at the expense of Indigenous conservation praxis. Evaluating how conservation practices outside of an Indigenous lens can become more inclusive and just is a critical area for research and reflection. We draw on our own experiences as early-career researchers working towards anticolonial, just and inclusive approaches to conservation science and practice by discussing what it means to be *for a Place*. We believe that a non-Indigenous conservationist who is *for a Place* advocates for inclusive stewardship with Indigenous Peoples and other marginalised communities to conserve species and ecosystems and the connections that bind communities to their landscapes. As an example of how settler–coloniser conservation practitioners can be *for a Place*, we discuss writing a policy statement in 2019 on behalf of the Society for Conservation Biology opposing the construction of the Thirty Meter Telescope on the summit of Mauna Kea, Hawai'i. We describe the thought process behind our policy statement and provide examples of other actions for conservation researchers and practitioners working to be *for a Place*. We aim to provide our colleagues, particularly those trained in settler–coloniser conservation practices, an opportunity to identify more just practices for the Places we aspire to conserve.

Keywords: astronomy, conservation, equity, indigenous knowledge, Mauna Kea, social and environmental justice.

Received 6 February 2020, accepted 24 August 2020, published online 6 November 2020

*Contributed equally. All other authors contributed equally and ordered by random number generator.

What does it mean to be *for a place*?

Mātauranga, *avatimik kamattiarni*, *aloha 'āina*. While these expressions originate from people who are separated by vast expanses of water, they are united in sentiment. *Mātauranga* refers to the knowledge created by Māori, Indigenous Peoples of Aotearoa New Zealand, and their interconnection and role as *kaitiaki* (guardians) to the lands and waters (Wehi *et al.* 2019). *Avatimik kamattiarni* is the Inuit description of their relationship to nature and their role as stewards of their environment, the Canadian Arctic (Government of Nunavut 2013). In Hawai'i, *aloha 'āina* represents not just a relationship between *kānaka maoli* (Native Hawaiians) and the land, or *'āina*, but their relationship with nature. This relationship Native Hawaiians have with nature is familial and incites a powerful obligation and responsibility – or *kuleana* – to care, honour, and respect the *'āina* (Conway-Jones 2004).

The relationship between people and nature is different for people not *of* the Place. Non-Indigenous people do not have the same genealogical connections to the land or water as Indigenous Peoples. For example, *kānaka maoli* are linked by cosmic origins to Mauna Kea, described in the Hawaiian cosmogonic creation story/chant, *Kumulipo* (Beckwith 1981; Kame'elei-hiwa 1992). Yet, the absence of an ancestral Place-based lineage does not mean that non-Indigenous people lack a physical or spiritual connection to a Place. Rather, in the words of Robin Wall Kimmerer (2013), we have the opportunity to be naturalised to that Place:

'Being naturalised to place means to live as if this is the land that feeds you, as if these are the streams from which you drink, that build your body and fill your spirit ... to know that your ancestors lie in this ground ... to live as if your children's future matters, to take care of the land as if our lives and the lives of all our relatives depend on it. Because they do.'

To be *for a Place* based conservation builds on this sentiment with an appreciation and respect for the deep history of a changing landscape, and recognition that humans have only been a part of the landscape for a short time: for Indigenous Peoples millennia, and settler-colonisers mere decades or centuries. To be *for a Place* requires openness and humility to learning what the land and its inhabitants have to teach us through knowledge accumulated by generations of Indigenous Peoples living in that Place, and the continued evolution of knowledge and culture.

Here, we discuss what it means, as conservation scientists trained in settler-coloniser practices and theories, to be *for a Place*. We describe how our experience at Mauna Kea inspired us to think deeply and critically about our personal and professional relationships to the Places where we work, and why we believe it's important to do the work to decolonise our science and practice.

On 28 October 2019, we (the authors) met with the Protectors – or *kia'i* – of Mauna Kea at *Pu'uhonua o Pu'uhuluhulu* in Hawai'i. We joined in the midday protocol – a community-building ceremony of *oli* (chants), *pule* (prayer), and *hula* – and learned that the *kia'i* were defending the ecological and spiritual integrity of Mauna Kea in the face of imperialist settler-coloniser institutions, such as the proposed Thirty Meter

Telescope (TMT) (Pu'uhonua o Pu'uhuluhulu 2019). The profound ethical obligations of the *kia'i* inspired us to take action in solidarity as fellow conservationists. Following this visit, we drafted a policy statement opposing the construction of the TMT on *Mauna a Wākea* (Mauna Kea), Hawai'i. This statement was later ratified by the Society for Conservation Biology. Our goal in writing the policy statement was to illustrate ongoing colonial (or neocolonial) practices in settler-coloniser science and conservation and add our voices in dissent of continued colonialist practices.

Being *for a Place* includes becoming an advocate for that Place. While some settler-coloniser science communicators are concerned about the role of scientists as advocates (Pielke 2007), conservation is a mission-driven discipline (Soulé 1985). The values, actions, and cultural lenses that scientists bring to their work fundamentally shape the way that all research is imagined and conducted. Being *for a Place* and advocating for inclusive stewardship with Indigenous Peoples and other marginalised communities is both just and essential for effective conservation (Soulé 1985; Smith 2013; Whyte 2016; Whaanga *et al.* 2018; Wehi *et al.* 2019). To be clear, advocacy *for a Place* is different from the 'white man/woman's burden' or 'white saviour', a complex where protecting the environment involves taking rights and control of Indigenous spaces rather than respecting self-determination (Bandyopadhyay and Patil 2017).

Drawing from and building on emerging anticolonial conservation literatures, we agree that in the absence of justice and equity for marginalised communities, conservation is not sustainable (Bennett *et al.* 2017b; Duffy *et al.* 2019). We believe that we can walk together with Indigenous Peoples toward meeting many common social-ecological goals, including the unique conservation challenges of the 21st century. However, to develop a more just and inclusive conservation community and achieve long-term conservation goals, we must acknowledge, reflect on, and work to dismantle the fundamental colonialist tenets (policies that are used by a colonial or foreign state to directly or indirectly dominate another: Cassese 1995) that underlie and continue to inform the conservation discipline.

Background

Mauna a Wākea – or Mauna Kea – is a dormant volcano on the island of Hawai'i in the North Pacific Ocean. 'Mauna Kea is a *kūpuna*, or elder – an ancestor to *kānaka maoli* representing the biophysical and genealogical links between the people of earth and their cosmic origins' (Na Maka o ka Aina 2020). Mauna Kea remains a sacred Place for worship, astronomy, and other cultural activities.

The *kia'i* are protesting the TMT's construction on the summit of Mauna Kea because settler-coloniser scientific instruments and access restrictions threaten ecological communities and Indigenous connections to, and stewardship of, the land (Kahanamoku *et al.* 2020). The managing institutions, University of Hawai'i (UH) and the TMT Corporation, have excluded – and continue to exclude – many *kānaka maoli* voices (KAHEA 2010; Kahanamoku *et al.* 2020). In response, many *kānaka maoli* are campaigning against the TMT's construction, which includes peaceful protest and occupation of the summit's access road. After previous protests in 2014 and 2015, TMT construction was scheduled to restart in July 2019, activating a

new occupation at the access road. The arrest of 33 *kūpuna* (grandparent, ancestor, relative or close friend of grandparent's generation: Pukui and Elbert 1986) on 17 July 2019 marked escalating tensions between UH, TMT Corporation, the state of Hawai'i, and *kia'i*.

As settler-coloniser or non-Indigenous conservationists, we stand with the *kia'i* in recognising that the Mauna Kea protection movement reflects Indigenous Place-based knowledge and conservation concerns. Mauna Kea's summit supports a fragile wind-shaped ecosystem, characterised by specialised primary producers and a unique community of arthropod predators and scavengers (Hartt and Neal 1940; Ashlock and Gagne 1983; Edwards 1987), including endangered and endemic species. Further degradation of summit ecosystems – already impacted by existing astronomical development and climate change (Zhang *et al.* 2017) – may be irreversible.

For astronomers foreign to Hawai'i, Mauna Kea has unique biophysical attributes that make it an exceptional site for astronomical observations (Maunakea Visitor Information Station 2020). Indeed, native Hawaiian astronomy has been, and continues to be, practiced at the summit. Since the 1960s, coloniser-state institutions, sponsored by 11 nations and numerous universities, have developed 13 astronomical observation facilities at Mauna Kea's sacred summit (Kahanamoku *et al.* 2020). The proposed construction of another observatory, the TMT, on Mauna Kea would be instrumental for non-Indigenous astronomical research (University of Hawai'i 2010).

However, construction of another observatory on Mauna Kea is also the perpetuation of a long history of colonisation practices adversely impacting the sociocultural, political, economic and natural resources of *kānaka maoli* (Kahanamoku *et al.* 2020). Land use at the summit is the direct result of the illegal US overthrow of the Hawaiian Monarchy in 1893. After several decades of colonial rule and sociocultural upheavals, Hawai'i gained representation in the US government with statehood in 1959, 5 years before the first road to Mauna Kea's summit was bulldozed.

To date, the persistent foreign astronomical research activity on Mauna Kea has occurred largely without many *kānaka maoli* involved in planning, managing, or economically benefiting from scientific activities. However, we acknowledge that UH has sought to include some *kānaka maoli* voices through the Kahu Ku Mauna, a community-based council advising Mauna Kea developers (<http://www.malamamauna-kea.org/management/kahu-ku-mauna>). Furthermore, we recognise that the construction of the 'Imiloa Astronomy Center is an effort by UH to bring together members of the Hawaiian and non-Hawaiian astronomy community to engage in a common vision for the future of Mauna Kea (<https://imiloahawaii.org/aboutimiloa>). Nonetheless, other *kānaka maoli* and their allies, who share a sense of stewardship for Mauna Kea, continue to disagree with the process of approval for construction and current management (Kahanamoku *et al.* 2020). The existing process directly conflicts with the conservation and astronomy community's values (Fu *et al.* 2019; Venkatesan *et al.* 2019). Such practices also obstruct genuinely collaborative efforts to achieve shared conservation goals for Mauna Kea and for all sacred sites on Indigenous lands (Garnett *et al.* 2018; Kahanamoku *et al.* 2020).

How do we walk the land together?

Non-Indigenous conservationists increasingly recognise that conservation approaches that actively advance social and environmental justice are necessary to achieve ecologically sound outcomes (Sikor *et al.* 2014; Martin *et al.* 2016; Bennett *et al.* 2017a; Ban *et al.* 2018). Such approaches prioritise equitable engagement between non-Indigenous and Indigenous stakeholders (Bussey *et al.* 2016; Ban *et al.* 2018; Chang *et al.* 2019). The terms 'co-management', 'community-based approaches', and 'integrating traditional knowledge' are becoming commonplace in the conservation literature (Wilder *et al.* 2016; Ban *et al.* 2018; Rubis and Theriault 2020). Similarly, calls to integrate the social sciences into conservation highlight the importance of incorporating different kinds of knowledge and building interdisciplinary collaborations from the inception of research projects (Bennett *et al.* 2017a, 2017b). Efforts towards sustained ecological health cannot have conservation as the only goal, but must also have justice as an equal goal; this necessitates that conservationists approach their work with justice as a moral, rather than only a functional imperative.

Even so, little guidance exists for settler-coloniser or non-Indigenous researchers to operationalise *for a Place*-based conservation science. Recent developments such as Indigenous biocultural knowledge, however, may offer a path forward for future conceptual and methodological development (Bohensky and Maru 2011; Ens *et al.* 2015; Gregg *et al.* 2015; Bussey *et al.* 2016). Structures and processes that foster the integration of human dimensions into conservation work can offer guideposts for settler-coloniser conservation practitioners to build authentic partnerships with Indigenous peoples (Bussey *et al.* 2016; Lawler and Bullock 2017; Wallen 2017; Wehi *et al.* 2019). Moreover, social science has been traditionally neglected by dominant settler-coloniser conservation practices. Settler-coloniser conservation practices have a short but incredibly disruptive history on Indigenous lands, and recent work to build collaborations and incorporate Indigenous Knowledge into conservation may be met with well-deserved scepticism, distrust, and non-engagement from Indigenous communities (Chang *et al.* 2019).

In practice, land that was taken during colonisation should be returned to Indigenous ownership, followed by effective co-management and collaboration (MacKenzie *et al.* 2007; Lawler and Bullock 2017). Effective conservation co-management of species and landscapes requires settler-coloniser conservation practitioners to acknowledge different ways of knowing in the context of violent colonial and neocolonial history (Valandra 2005; Smith 2013; Kahanamoku *et al.* 2020), rather than resorting to performative, institutionally mandated box-ticking. Moving towards a future with reparative, equitable, and resilient conservation outcomes, conservationists trained in settler-coloniser science must acknowledge and reflect on at least two key factors in reframing our science and practice:

- (1) **First, foundational tools used in conservation science (i.e. land conservation) were deployed alongside genocidal violence and displacement of Indigenous communities.**

Settler-coloniser conservationists must recognise and understand the colonialist norms and methods foundational

to our discipline that were established during the ‘discovery’ of the ‘New World’. For example, the first federal conservation lands in the US (e.g. the National Parks System) accompanied violent removal, genocide, and erasure of Indigenous Peoples from the landscape, such as Ahwahneechee peoples of what is now Yosemite National Park (Sanford 2019). Such acts were sanctioned by the ‘Doctrine of Discovery’ – the legal premise for ‘discoverers’ of the ‘New World’ to gain automatic sovereignty and property rights, despite many generations of Indigenous Peoples’ presence (Miller 2005).

(2) **Second, contemporary conservation efforts continue to displace Indigenous sovereignty and perpetuate neocolonialism.**

Today, federal conservation land management in the US frames how people interact with conserved Places on a daily basis (Sanford 2019). Prominent conservation practices, such as ‘fortress conservation’, perpetuate the exclusion of Indigenous Peoples from their lands and/or deny them management rights (Sarkar and Montoya 2011; Van Vleet *et al.* 2016). Other contemporary conservation approaches, such as the Half-Earth Project, continue to counteract efforts toward social justice by implicitly advocating for practices leading to human displacement (Schleicher *et al.* 2019). Notably absent from many of these approaches are the social–ecological connections of peoples to Place and Place to peoples.

Settler–coloniser conservation practitioners must move beyond appeals for performative engagement and actively build authentic relationships with Indigenous Peoples. Too often, success is defined within a settler coloniser framework (Chang *et al.* 2019; Rubis and Theriault 2020). In many cases, settler–coloniser practices are prioritised over the interests, sovereignty, and scientific expertise and conservation practices of those whose lands we are working on, reinforcing the false hierarchy of which way of knowing is the ‘correct’ way (Smith 2013). Consequently, settler–coloniser-led science continues to participate in neocolonial pressures on Indigenous Peoples and Places.

Only by acknowledging the violent and racist history of conservation science and practice can we reflect, question, and work to dismantle neocolonial practices (Valandra 2005). Settler–coloniser conservation practitioners must learn to acknowledge and revise our own participation in harmful practices. This work is unsettling but necessary to achieve social and environmental justice, and effective conservation outcomes. This work requires settler–coloniser conservation practitioners to actively develop a new conservation science praxis, where knowledge production, and resource management are shared equitably (Smith 2013; Chang *et al.* 2019; Kahanamoku *et al.* 2020). It is important to note that confronting and dismantling the ways in which settler–colonial praxis are built into conservation is a lifelong practice, where mistakes are expected.

Here, we share five approaches we took to build more inclusive conservation practices prior to and during our time with the *kia*’i. We provide examples for how one may begin to transfer these recommendations to non-Indigenous conservation science and practice more broadly.

Educate ourselves

Learn about the history of the Places where you work and live, and the Indigenous people affected by colonisation (Valandra 2005; Kahanamoku *et al.* 2020). Learn about the violence, broken treaties, and colonisation methods (e.g. criminalising Indigenous languages) that led to either genocide or assimilation of Indigenous people. Learn about the resilience and culture. Learn how to do reparative environmental justice work (Valandra 2005; MacKenzie *et al.* 2007), that is taking measures to repair harm done through human rights violations committed against them (Muddell and Hawkins 2018). A deeper appreciation for a Place, its people, and their histories will enhance our ability to achieve our goals for conserving biodiversity and habitats. We studied articles on the *kia*’i and the TMT, and focused on the history and genealogy of Mauna Kea from our *kānaka maoli* hosts before protocol and from the *kia*’i during protocol. We also learned about *kānaka maoli* scientific practices, such as wayfinding astronomy and Indigenous conservation practices of *Hālau ‘Ōhi’a* (Karjala *et al.* 2018; Kealiikanakaoleohaililani *et al.* 2018).

Extending to practice

Read the works of Indigenous authors and scholars beyond your own disciplinary boundaries. Indeed, Kahanamoku *et al.* (2020) recommends that astronomers foreign to Hawai’i using Mauna Kea-based astronomical instruments should ‘learn Hawaiian history and culture, regardless of whether they are physically present in Hawai’i’. Engage with programs that connect non-Indigenous researchers with Indigenous scholars and communities; examples include the Abbe Museum in Bar Harbor in Maine and the Holding Up the Sky Exhibit at Maine Historical Society’s Portland Gallery, honouring the lands and waters of the Wabanaki (Maliseet, Micmac, Penobscot and Passamaquoddy), the University of Maine WaYS (Wabanaki Youth in Science), and other institutional programming cocreated with Indigenous scholars. Learn about efforts in reparative justice, either recommended or currently underway in the Place where you are working. It can be hard to put yourself on the line, but it is important to take the leap. Be cautious to avoid putting an additional burden on Indigenous Peoples by expecting them to teach us; we must take ownership of our education and praxis as much as possible.

Acknowledge

Acknowledge those who have genealogical connections to the land, and the ancestors past, present, and future (e.g. <https://native-land.ca/>). Spoken land acknowledgements are a relatively new practice but are gaining traction in academic institutions. These statements are aimed to transform neocolonial institutions and power arrangements by amplifying Indigenous Peoples’ survival and resistance to genocidal policies that aim to eradicate Indigenous epistemologies (Robinson *et al.* 2019). Giving land back with words by acknowledging Indigenous presence is an important step in reparative justice (Valandra 2005), but not the only one: it is critical to move beyond acknowledgment toward actioning reparative justice practices. Learning how short and traumatic the colonial era (e.g. ~127 years for colonial rule in Hawai’i) has been compared with the

millennia *kānaka maoli* have lived on the islands of Hawai‘i made it even more apparent that we needed to honour and acknowledge whose land we were walking on.

Extending to practice

Many institutions offer example land acknowledgments that can be used as a starting point for developing your own (e.g. <https://usdac.us/nativeland>). Importantly, land acknowledgements should not be a token description, as if describing a museum artefact; Indigenous cultures are alive! Include a call to action. For example, encourage audience members to donate to an organisation like the American Indian College Fund or legal support for land defenders.

Show up. Listen. Keep an open mind and an open heart

Making time to show up and listen is key to expanding our knowledge of Indigenous Peoples and Places and building relationships of trust. The cocreation of inclusive and just conservation praxis necessitates that partners have equal power to shape the research direction (Smith 2013). As we do this, we must keep humility in the front of our minds. By discussing and reflecting on the privilege of our position prior to meeting our *kānaka maoli* hosts and the *kia* ‘i, we were more prepared to fully listen to their voices and participate in their practice. When they warmly encouraged the participation of all visitors in a certain part of the *hula* during protocol, we were ready to take off our shoes and follow their lead on the *ala* – or road – as they performed in honour of their ancestor, Mauna Kea. This is an example of a first step toward building a collaborative relationship with an Indigenous Community leading toward knowledge cocreation and equitable co-management.

Extending to practice

Examples include writing proposals with Indigenous partners with budgets that support the Indigenous partnership (travel for both parties to visit each other, reimbursing people for their time, hiring Indigenous students as research assistants in university laboratories). Arrive at meetings with Indigenous partners with a ‘blank page’ – look to them to set priorities rather than arriving with predetermined priorities and strategies. Listen without thinking of an answer or ‘solution’ to an issue or question. Cross-pollinating ways of knowing and scientific traditions is fertile ground for conservation breakthroughs. Rather than participating from a place of insecurity, participate with a peaceful, open heart, ready to do the work and continue growing. For these approaches to be realised, we acknowledge that leaders engaging in decision-making must value Indigenous Peoples’ perspectives. Although this is not the norm, we can make it so by hiring and promoting Indigenous Peoples into decision-making positions and demanding that current decision-makers demonstrate inclusive approaches and implement action plans to increase Indigenous participation.

Learn when to interrupt, disrupt or sit down

In our professional lives, we need to be willing to take on different roles. Actively think about centering Indigenous communities, interrupt narratives that reinforce colonial and racist conservation norms, and disrupt established systems that continue to overlook

and marginalise Indigenous Peoples. When we wrote our policy statement, we were aware of contention regarding TMT among Indigenous and non-Indigenous scientists, particularly within the settler–coloniser conservation community. Indeed, we were challenged immediately after it was published. We are not *kānaka maoli*, but we recognised that we are *for* Mauna Kea, *for* protecting all sacred Places. We have the privilege to share this message to a broad conservation audience, so we used our platform to further amplify the message of the *kia* ‘i and push for dismantling neocolonial practices within our discipline.

It’s uncomfortable. We may feel shame for our ancestors’ actions and shame that we have the luxury to benefit from institutions and norms built on their atrocities. We may hold ourselves back because of the fear that we will say or do something wrong or hurtful. We may feel fragile when our privilege is threatened (Kendi 2019). We must embrace the discomfort and fear rather than reacting defensively; being uncomfortable is one space where real emotional work can begin. Simultaneously, we should normalise stepping out of the spotlight while amplifying Indigenous voices.

Extending to practice

Bring up Indigenous issues in casual conversation to challenge the dominant racist narratives. When participating in local conservation planning and management, advocate for Indigenous voices, knowledge, and reparative justice initiatives to be discussed and incorporated. When invited to a settler–coloniser dominated panel on conservation science, advocate for an Indigenous scholar who should take your place. If you serve on a panel, deliver disruptive land acknowledgements, but make sure you have done the research to accurately represent the history of that Place (see *Acknowledge* above).

Act with humility, curiosity, and patience

Try as we might, settler–coloniser conservationists will make mistakes. Indeed we, the authors, will have made mistakes in writing this paper. However, we argue that making a mistake from a place of sincere thoughtfulness and compassion is better than no action at all. Work to recognise these inevitable missteps and be humble in the face of mistakes. Humility is a simple idea but also a radical antithesis to modern settler–coloniser culture, particularly in the academy. A humility cultural norm could collectively disrupt barriers to collaboration, sharing of resources, and larger-scale conservation outcomes.

Be curious about how you can learn from these inevitable missteps. Offer apologies without defensiveness, and humbly ask for a chance to improve, but do not *expect* forgiveness. We made mistakes in our policy statement. We unintentionally offended members of the conservation community, including Indigenous conservation scientists and astronomers, who challenged the notion that our statement was representative of all *kānaka maoli*. We reflected deeply on this feedback and worked hard to rectify where we had overstepped. This reflection also re-emphasised that we believe we are standing on the right side of history in opposing the construction of the TMT on Mauna Kea. We support the action by TMT stakeholders in working with Native Hawaiian cultural knowledge holders to restart dialogue on astronomy development (Kahanamoku *et al.* 2020).

Change can be slow; many of the problems conservation science works to address have been decades or centuries in the making. Patience is necessary for maintaining optimism toward conservation goals and showing respect to the Peoples and Places we work with.

Extending to practice

Own your impact by apologising and correcting your mistakes. Rather than explaining or defending them, learn from them. Do not expect limitless patience for mistakes. Do not expect Indigenous collaborators to teach you. Use your advanced research skills to learn about the history and current context of the Places where you choose to work, create space and listen. Read the works of Indigenous scholars: following Indigenous people and organisations on social media is one way to stay informed about pressing and ongoing issues faced by Indigenous researchers and communities. Be patient and do the work to build relationships with Indigenous scientists and communities. Listen and reflect.

Our focus here has emphasised being *for a Place* with respect to Indigenous communities. Yet, being *for a Place* can and must extend to all marginalised communities. We recognise that most instances of ecological harm have roots in systemic social inequality (Adhikari and Lovett 2006; Andersson and Agrawal 2011; Cushing *et al.* 2015). Consider being *for a Place* in an urban ecosystem. Cities are highly heterogeneous landscapes and Black, Indigenous, and People of Colour (BIPOC) in cities have substantially lower access to environmental amenities (e.g. urban parks) but are simultaneously exposed to more environmental disamenities (e.g. pollution sources) (Corbera *et al.* 2007; Cushing *et al.* 2015). Being *for a Place* while doing urban conservation and environmentalism means reconciling equity and justice for both Indigenous peoples as well as other marginalised communities.

For example, Portland, Oregon, has one of the largest Native American communities in the US, representing over 300 tribal affiliations, most of which do not have ancestral ties to the Portland area. At the same time, Portland has a racist urban planning history including residential segregation, particularly towards Black Americans. Tasked with providing safe places that ‘promote physical, mental, and social health and well-being in the city’s parks, public space, and natural areas’, Portland Parks & Recreation (PP&R) often employs principles of being *for a Place*. For instance, the Native American Community Advisory Council advises PP&R about Native cultural, spiritual, and physical needs of the Indigenous community and collaborates in developing, managing and restoring PP&R lands and creating policies. The ‘Parks for New Portlanders’ program is aimed at managing the city’s lands and programs to benefit BIPOC, refugee and immigrant communities. Through these and other efforts, PP&R employees often employ principles of being *for a Place* to equitably and justly manage the city’s natural spaces. This is one such example of where being *for a Place* can result in beneficial social–ecological outcomes, emerging from sustained social and environmental justice through institutional governance of the commons (Ostrom 1990; Andersson and Agrawal 2011).

Social–ecological systems concepts emphasise a complexity that cannot be addressed by single-panacea approaches (Ostrom



Fig. 1. Word cloud of statements made by authors of this perspective piece in response to ‘What does it mean to be for a Place?’. Word cloud was generated on <https://www.jasondavies.com/wordcloud/> using these options: (1) spiral: Archimedean, and (2) scale: $\log(n)$.

2007). But being *for a Place* is not a single, prescriptive panacea. Rather, being *for a Place* is an ethical and conceptual framework for advancing conservation in an inclusive and just manner. Indeed, the processes of learning, diagnosing and adapting are fundamental to governance in social–ecological systems (Brock and Carpenter 2007; Ostrom 2007). This process is embedded in the principles we advocate for here.

Conclusions

Though settler–coloniser conservation practices have made progress toward considering inclusion and social justice, we are far from repairing harms of historic and neocolonial practices to Indigenous Peoples (Chang *et al.* 2019). In Hawai‘i, *kānaka maoli* have been the ones to compromise their rights in the name of settler–coloniser astronomical practices. This is a direct affront to achieving environmental justice (Kahanamoku *et al.* 2020). But the conservation discipline can evolve to be more inclusive and just by embedding principles of being *for a Place* into practice. Settler–coloniser conservation practitioners have a crucial role in bringing about this transformation.

When asked, ‘what does it mean to be *for a Place*?’, the authors shared many ideas including: exercising *humility*, working with *community*, being *curious* and seeking *knowledge* (Fig. 1). Collectively, we believe that to be *for a Place* means continuous reflection on the consequences of our actions on the Place and people who are connected to the land. It means having a willingness to unseat your comfort and put ego aside to act with intention and humility. A conservation scientist or practitioner who is *for a Place* stands by the Place for the long haul, embraces complexity, and maintains hope despite the often painfully slow pace of systems-level change. To be a conservationist who is *for a Place* means acknowledging, learning from, and integrating Indigenous conservation practices, perspectives, and ways of knowing. Ultimately, when we are *for a Place*, we guarantee that the Place will be for us and for those that come after us. This sentiment follows the ‘*ōlelo no‘eau* (Hawaiian proverb), ‘*He ali‘i ka ‘āina, he kauwā ke kanaka*’ – The land is a chief; man is its servant (Pukui 1983).

Conflicts of interest

The authors declare no conflicts of interest.

Acknowledgements

While writing this paper, SBB worked on the ancestral lands of the Huron-Wendat, Seneca, and Mississaugas of the Credit River, and Ngāti Paoa; JBK on the lands of Kānaka ʻŌiwi; CMM on the lands of Wabanaki (Abenaki, Maliseet, Micmac, Penobscot and Passamaquoddy), People of the Dawnland; KEI on the lands of Kalapuya, Chinook, and Cowlitz; BMM on the lands of Dakota Sioux, Ioway, and Meskwaki; MRL on the lands of Ohlone and Clackamas; AMB on the lands of Odq̓hweja:de? (Cayuga), Haudenosaunee, and Susquehannock; JD on the lands of the Western Mono (Monache), the Foothills Yokuts, and the Tubatulabal; AKT on the lands of Pocumtuc, Nipmuck, Abenaki/Abénaquis, Pennacook, Wabanaki Confederacy lands; GCW on the lands of the Chumash and Barbareño; CHC on the lands of the Tongva, Serrano, and Cahuilla, as well as the Tai Lü, Haqniq, Yi, Yao, Jinuo, and Lahu of Sipsong Panna. Mahalo nui to Noelani Puniwai, Moana ʻUluʻ Ching, and the *kiaʻi* of Mauna Kea for welcoming us to Puʻuhonua o Puʻu huluhulu and teaching us about *aloha ʻaina* and Mauna Kea. Many thanks to M. Price for fruitful discussions and inviting us to write this piece. Thanks also to T. Young, M. Bletz, M. Bogan and S. Foster. All authors are supported by the David H. Smith Conservation Research Fellowship.

References

- Adhikari, B., and Lovett, J. C. (2006). Institutions and collective action: does heterogeneity matter in community-based resource management? *The Journal of Development Studies* **42**, 426–445. doi:10.1080/00220380600576201
- Andersson, K., and Agrawal, A. (2011). Inequalities, institutions, and forest commons. *Global environmental change* **21**, 866–875. doi:10.1016/J.GLOENVCHA.2011.03.004
- Ashlock, P. D., and Gagne, W. C. (1983). A remarkable new micropterous *Nysius* species from the aeolian zone of Mauna Kea, Hawaii Island (Hemiptera: Heteroptera: Lygaeidae). *International Journal of Entomology* **25**, 47–55.
- Ban, N. C., Frid, A., Reid, M., Edgar, B., Shaw, D., and Siwallace, P. (2018). Incorporate Indigenous perspectives for impactful research and effective management. *Nature Ecology & Evolution* **2**, 1680–1683. doi:10.1038/S41559-018-0706-0
- Bandyopadhyay, R., and Patil, V. (2017). 'The white woman's burden' – the racialized, gendered politics of volunteer tourism. *Tourism Geographies* **19**, 644–657. doi:10.1080/14616688.2017.1298150
- Beckwith, M. W. (1981). 'The Kumulipo: a Hawaiian Creation Chant.' (University of Hawaii Press.)
- Bennett, N. J., Roth, R., Klain, S. C., Chan, K., Christie, P., Clark, D. A., Cullman, G., Curran, D., Durbin, T. J., and Epstein, G. (2017a). Conservation social science: Understanding and integrating human dimensions to improve conservation. *Biological Conservation* **205**, 93–108. doi:10.1016/J.BIOCON.2016.10.006
- Bennett, N. J., Roth, R., Klain, S. C., Chan, K. M., Clark, D. A., Cullman, G., Epstein, G., Nelson, M. P., Stedman, R., and Teel, T. L. (2017b). Mainstreaming the social sciences in conservation. *Conservation Biology* **31**, 56–66. doi:10.1111/COBI.12788
- Bohensky, E., and Maru, Y. (2011). Indigenous Knowledge, Science, and Resilience: What Have We Learned from a Decade of International Literature on "Integration"? *Ecology and Society* **16**. doi:10.5751/ES-04342-160406
- Brock, W. A., and Carpenter, S. R. (2007). Panaceas and diversification of environmental policy. *Proceedings of the National Academy of Sciences* **104**, 15206–15211. doi:10.1073/PNAS.0702096104
- Bussey, J., Davenport, M. A., Emery, M. R., and Carroll, C. (2016). "A lot of it comes from the heart": The nature and integration of ecological knowledge in tribal and nontribal forest management. *Journal of Forestry* **114**, 97–107. doi:10.5849/JOF.14-130
- Cassese, A. (1995). 'Self-Determination of Peoples: A Legal Reappraisal.' (Cambridge University Press.)
- Chang, K., Winter, K. B., and Lincoln, N. K. (2019). 'Hawai'i in Focus: Navigating Pathways in Global Biocultural Leadership.' (Multidisciplinary Digital Publishing Institute.)
- Conway-Jones, D. (2004). Safeguarding Hawaiian Traditional Knowledge and Cultural Heritage: Supporting the Right to Self-Determination and Preventing the Co-modification of Culture. *Howard Law Journal* **48**, 737–762.
- Corbera, E., Brown, K., and Adger, W. N. (2007). The equity and legitimacy of markets for ecosystem services. *Development and Change* **38**, 587–613. doi:10.1111/J.1467-7660.2007.00425.X
- Cushing, L., Morello-Frosch, R., Wander, M., and Pastor, M. (2015). The haves, the have-nots, and the health of everyone: the relationship between social inequality and environmental quality. *Annual Review of Public Health* **36**, 193–209. doi:10.1146/ANNUREV-PUB LHEALTH-031914-122646
- Duffy, R., Massé, F., Smidt, E., Marijnen, E., Büscher, B., Verweijen, J., Ramutsindela, M., Simlai, T., Laure Joanny, L., and Lunstrum, E. (2019). Why we must question the militarisation of conservation. *Biological Conservation* **232**, 66–73.
- Edwards, J. S. (1987). Arthropods of alpine aeolian ecosystems. *Annual Review of Entomology* **32**, 163–179. doi:10.1146/ANNUREV.EN.32.010187.001115
- Ens, E. J., Pert, P., Clarke, P. A., *et al.* (2015). Indigenous biocultural knowledge in ecosystem science and management: Review and insight from Australia. *Biological Conservation* **181**, 133–149. doi:10.1016/J.BIOCON.2014.11.008
- Fu S.W., de los Reyes, M., Nance, S., *et al.* (2019). Astronomy community opposition to the Thirty Meter Telescope. Available at <https://docs.google.com/document/d/1YR8M4eboRjJSfvVtmukb6dDgUonDBdm-j9AU0h1rkMY/preview>.
- Garnett, S. T., Burgess, N. D., Fa, J. E., *et al.* (2018). A spatial overview of the global importance of Indigenous lands for conservation. *Nature Sustainability* **1**, 369–374. doi:10.1038/S41893-018-0100-6
- Government of Nunavut (2013). Incorporating Inuit societal values. Nunavut, Canada. Available at https://www.gov.nu.ca/sites/default/files/files/incorporating_inuit_societal_values_report.pdf.
- Gregg, T. M., Mead, L., Burns, J. H., and Takabayashi, M. (2015). *Puka mai he ko 'a*: the significance of corals in Hawaiian culture. In 'Ethnobiology of Corals and Coral Reefs'. (Eds N. Narchi, and L. L. Price.) pp. 103–115. (Springer.)
- Hart, C. E., and Neal, M. C. (1940). The plant ecology of Mauna Kea, Hawaii. *Ecology* **21**, 237–266. doi:10.2307/1930491
- Kahanamoku, S., Alegado, R., Anolani, Kagawa-Viviani, A., Kamelamela, K. L., Kamai, B., Walkowicz, L. M., Prescod-Weinstein, C., de los Reyes, M. A., Neilson, H. (2020). A Native Hawaiian-led summary of the current impact of constructing the Thirty Meter Telescope on Maunakea. arXiv:2001.00970.
- KAHEA (2010). Kahea Comments on TMT. Available at http://www.kahea.org/issues/sacred-summits/sacred-summits-documents/kahea-comments-on-tmt/at_download/file.
- Kame'elehiwa, L. (1992). 'Native Land and Foreign Desires: Pehea lā e pono ai.' (Bishop Museum Press: Honolulu, HI.)
- Karjala, P., Lodes, D., Noe, K., Sikkink, A., and Leigh, J. (2018). Kilo Hōkū – Experiencing Hawaiian, Non-Instrument Open Ocean Navigation through Virtual Reality. *Presence: Teleoperators and Virtual Environments* **26**, 264–280.
- Kealiikanakaolehailani, K., Kurashima, N., Francisco, K. S., Giardina, C. P., Louis, R. P., McMillen, H., Asing, C. K., Asing, K., Block, T. A., and Browning, M. (2018). Ritual+ sustainability science? A portal into the science of aloha. *Sustainability* **10**, 3478. doi:10.3390/SU10103478
- Kendi, I. X. (2019). 'How to be an Antiracist.' (One World.)

- Kimmerer, R. (2013). 'Braiding Sweetgrass: Indigenous Wisdom, Scientific Knowledge and the Teachings of Plants.' (Milkweed Editions.)
- Lawler, J. H., and Bullock, R. C. (2017). A case for Indigenous community forestry. *Journal of Forestry* **115**, 117–125. doi:10.5849/JOF.16-038
- MacKenzie, M. K., Serrano, S. K., and Kaulukukui, K. L. (2007). Environmental Justice for Indigenous Hawaiians: Reclaiming Land and Resources. *Natural Resources & Environment* **21**, 37–79.
- Martin, A., Coolsaet, B., Corbera, E., Dawson, N. M., Fraser, J. A., Lehmann, I., and Rodriguez, I. (2016). Justice and conservation: The need to incorporate recognition. *Biological Conservation* **197**, 254–261. doi:10.1016/J.BIOCON.2016.03.021
- Maunakea Visitor Information Station (2020). Culture, astronomy and natural history. Available at <http://www.ifa.hawaii.edu/info/vis/culture-astronomy-and-natural-history.html>.
- Miller, R. (2005). 'The Doctrine of Discovery in American Indian Law.' (Idaho Law Review.)
- Muddell, K., and Hawkins, S. (2018). Gender and transitional justice: a training module series. International Center for Transitional Justice. Available at https://www.ictj.org/sites/default/files/3_Gender%20%26%20TJ%20-%20Reparative%20Justice%20-%20Speaker%20Notes.pdf.
- Na Maka o ka Aina (2020). Mauna Kea="White Mountain"? Available at http://www.mauna-a-wakea.info/maunakea/F2_whitemountain.html.
- Ostrom, E. (1990). 'Governing the Commons: The Evolution of Institutions for Collective Action.' (Cambridge University Press.)
- Ostrom, E. (2007). A diagnostic approach for going beyond panaceas. *Proceedings of the National Academy of Sciences* **104**, 15181–15187. doi:10.1073/PNAS.0702288104
- Pielke, R. A. Jr (2007). 'The Honest Broker: Making Sense of Science in Policy and Politics.' (Cambridge University Press.)
- Pu'uhonua o Pu'uhuluhulu (2019). Protocol – Mele, Pule, Oli & Hula. Available at <https://www.puuhuluhulu.com/learn/protocol>.
- Pukui, M. K. (1983). 'Ōlelo No 'eau: Hawaiian Proverbs and Poetical Sayings.' (Bishop Museum Press: Honolulu, HI.)
- Pukui, M. K., and Elbert, S. H. (1986). 'Hawaiian Dictionary: Hawaiian–English, English–Hawaiian.' (University of Hawaii Press.)
- Robinson, D., Hill, K. J. C., Ruffo, A. G., Couture, S., and Ravensbergen, L. C. (2019). Rethinking the practice and performance of Indigenous land acknowledgement. *Canadian Theatre Review* **177**, 20–30. doi:10.3138/CTR.177.004
- Rubis, J. M., and Theriault, N. (2020). Concealing protocols: conservation, Indigenous survivance, and the dilemmas of visibility. *Social & Cultural Geography* **21**, 962–984. doi:10.1080/14649365.2019.1574882
- Sanford, P. (2019). Why we must teach the ugly side of public lands + a tool to help. Available at <https://www.wilderness.org/articles/blog/why-we-must-teach-ugly-side-public-lands-history-tool-help>.
- Sarkar, S., and Montoya, M. (2011). Beyond parks and reserves: the ethics and politics of conservation with a case study from Perú. *Biological Conservation* **144**, 979–988. doi:10.1016/J.BIOCON.2010.03.008
- Schleicher, J., Zaehring, J. G., Fastré, C., Vira, B., Visconti, P., and Sandbrook, C. (2019). Protecting half of the planet could directly affect over one billion people. *Nature Sustainability* **2**, 1094–1096. doi:10.1038/S41893-019-0423-Y
- Sikor, T., Martin, A., Fisher, J. A., and He, J. (2014). Toward an empirical analysis of justice in ecosystem governance. *Conservation Letters* **7**, 524–532. doi:10.1111/CONL.12142
- Smith, L. (2013). 'Decolonizing Methodologies: Research and Indigenous Peoples.' (Zed Books Ltd.)
- Soulé, M. E. (1985). What is conservation biology? *BioScience* **35**, 727–734. doi:10.2307/1310054
- University of Hawai'i (2010). Final environmental impact statement: Thirty Meter Telescope. Honolulu, HI. Available at http://www.malamamaunakea.org/uploads/management/plans/TMT_FEIS_vol1.pdf.
- Valandra, E. C. (2005). 'Decolonizing "Truth": Restoring More than Justice. Page Justice as Healing: Indigenous Ways.' (Living Justice Press: St Paul, MN.)
- Van Vleet, E., Bray, D. B., and Durán, E. (2016). Knowing but not knowing: systematic conservation planning and community conservation in the Sierra Norte of Oaxaca, Mexico. *Land Use Policy* **59**, 504–515. doi:10.1016/J.LANDUSEPOL.2016.09.010
- Venkatesan, A., Begay, D., Burgasser, A. J., Hawkins, I., Maryboy, N., and Peticolas, L. (2019). Towards inclusive practices with Indigenous knowledge. *Nature Astronomy* **3**, 1035–1037.
- Wallen, K. E. (2017). Focusing on structure and process to integrate and mainstream the social sciences in conservation. *Conservation Biology* **31**, 724–726. doi:10.1111/COBI.12871
- Wehi, P. M., Beggs, J. R., and McAllister, T. G. (2019). Ka mua, ka muri. *New Zealand Journal of Ecology* **43**, 1–8. doi:10.20417/NZJECOL.43.40
- Whaanga, H., Wehi, P., Cox, M., Roa, T., and Kusabs, I. (2018). Māori oral traditions record and convey Indigenous knowledge of marine and freshwater resources. *New Zealand Journal of Marine and Freshwater Research* **52**, 487–496. doi:10.1080/00288330.2018.1488749
- Whyte, K. (2016). Our ancestors' dystopia now: Indigenous conservation and the Anthropocene. SSRN Scholarly Paper ID 2770047. Social Science Research Network, Rochester, NY.
- Wilder, B. T., O'Meara, C., Monti, L., and Nabhan, G. P. (2016). The Importance of Indigenous Knowledge in Curbing the Loss of Language and Biodiversity. *BioScience* **66**, 499–509. doi:10.1093/BIOSCI/BIW026
- Zhang, C., Hamilton, K., and Wang, Y. (2017). Monitoring and projecting snow on Hawaii Island. *Earth's Future* **5**, 436–448. doi:10.1002/2016EF000478