

# Conservation and the social sciences: Beyond critique and co-optation. A case study from orangutan conservation

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## Funding information

Brunel University London, Grant/Award Number: R33648; H2020 European Research Council, Grant/Award Number: 758494

Handling Editor: Zsolt Molnar

## Abstract

1. Interactions between conservation and the social sciences are frequently characterized by either critique (of conservation by social scientists) or co-optation (of social scientific methods and insights by conservationists).
2. This article seeks to push beyond these two dominant positions by exploring how conservationists and social scientists can engage in mutually transformative dialogue. Jointly authored by conservation scientists and social scientists, it uses the global nexus of orangutan conservation as a lens onto current challenges and possibilities facing the conservation–social science relationship.
3. We begin with a cross-disciplinary overview of recent developments in orangutan conservation—particularly those concerned with its social, political and other human dimensions.
4. The article then undertakes a synthetic analysis of key challenges in orangutan conservation—working across difference, juggling scales and contexts and dealing with politics and political economy—and links them to analogous concerns in the conservation–social science relationship.
5. Finally, we identify some ways by which orangutan conservation specifically, and the conservation–social science relationship more generally, can move forward: through careful use of proxies as bridging devices, through the creation of new, shared spaces, and through a willingness to destabilize and overhaul status quos. This demands an open-ended, unavoidably political commitment to critical reflexivity and self-transformation on the part of both conservationists and social scientists.

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## KEYWORDS

Borneo, conservation–social science relationship, Orangutan conservation, Sumatra

## 1 | INTRODUCTION

The past decade has seen a resurgence of interest in the value of the social sciences to wildlife conservation. Although the relationship between the two fields has been a topic of critical, applied and collaborative interest since at least the early 2000s (e.g. Brosius, 2006; Büscher & Wolmer, 2007; Chan et al., 2007; Mascia et al., 2003; McShane et al., 2011; Peterson, Russell, West, & Peter Brosius, 2010; Sandbrook, Adams, Büscher, & Vira, 2013; West & Brockington, 2006; West, Brockington, & Igoe, 2006), there has been a recent drive to ‘mainstream’ (Bennett, Roth, Klain, Chan, Clark, et al., 2017) social scientific research, insights and methods in conservation science and practice. This is manifested, for example, in the increasingly widespread use of the term ‘conservation social science’—defined by Bennett, Roth, Klain, Chan, Christie, et al. (2017, p. 94) as ‘diverse traditions of using social science to understand and improve conservation policy, practice and outcomes’—and a rush of publications that expound on different social sciences and offer concrete recommendations for conservationists seeking to engage with them (e.g. Bennett & Roth, 2019; Bennett, Roth, Klain, Chan, Clark, et al., 2017; Crandall et al., 2018; Moon & Blackman, 2014; Moon et al., 2019; St John, Keane, Jones, & Milner-Gulland, 2014; Sutherland, Dicks, Everard, & Geneletti, 2018).

These contributions have greatly increased the visibility of the social sciences within conservation, (theoretically) turning them into an integral part of conservation thought and practice. However, much work is still required. First, there remains a paucity of real-world examples of how these publications’ idealized recommendations might work in practice. Second, depictions of the scope and nature of the social sciences can be overly vague or narrow, resulting in superficial rather than genuinely transformative efforts to integrate them into conservation practice (e.g. Bennett & Roth, 2019; Bennett, Roth, Klain, Chan, Clark, et al., 2017; Kovács & Pataki, ; Moon et al., 2019). In this way, social scientific methods and insights may simply end up getting co-opted into existing conservation programmes. Third, such discussions do not always critically interrogate their most basic premises—particularly when/whether conservation interventions are justifiable or viable in certain contexts. Finally, social scientists have sometimes proved reluctant collaborators, preferring to critique conservation or write for their own peers (Bennett & Roth, 2019, p. A7; Bennett, Roth, Klain, Chan, Clark, et al., 2017, pp. 63–64; Kiik, 2018b, pp. 4–5; Redford, 2018, pp. 228–229).

Against this backdrop, our article has three main aims. First, it seeks to bring empirical depth to these ongoing conversations by grounding it in one case study: the global nexus of orangutan

conservation (in or on which most of us work) and its many social contexts. What follows, however, is not an account of a conservation–social science collaboration in the field. Rather, this article is itself an example of collaboration-in-action. Jointly authored by social scientists and conservation scientists, it entails a synthetic analysis of key challenges and possibilities in contemporary orangutan conservation. This article is thus not written about the social sciences for conservationists, but as a manifestation of an unfolding dialogue between members of the two fields. Through this, we aim, third, to reflect critically and constructively on the evolving conservation/social science relationship, asking how each can inform but also transform the other. In this respect, we seek to re-insert some of the critical, reflexive sensibilities of earlier exchanges (e.g. Brosius, 2006; Büscher & Wolmer, 2007; Mascia et al., 2003; West & Brockington, 2006) into the conversations that are taking place today.

This article originated in the ‘Conservation and the Social Sciences: Beyond Critique and Co-optation’ workshop, which was convened in December 2018 as part of a larger social anthropological project, *Refiguring Conservation in/for ‘the Anthropocene’: the Global Lives of the Orangutan* (GLO).<sup>1</sup> The workshop was initially designed as a small meeting between GLO’s research team and its UK- and Europe-based conservation partners: as an informal opportunity to reflect on developments in orangutan conservation. As GLO’s research developed, however, the team elected to convene a larger, more far-reaching workshop that put conservationists and social scientists in dialogue, using an empirical focus on orangutan conservation to spark reflexive thought about the relationship between our respective fields. In particular, we were keen to explore ways of nudging the conservation–social science relationship beyond two common impasses (which have also been noted by Brockington, Scholfield, & Ladle, 2018; Brosius, 2006; Larsen, 2018; Mascia et al., 2003; Redford, 2018; West & Brockington, 2006). These are as follows: the long-running, and still dominant, tendency among social scientists to *critique* conservation (Section 2.3.2; Kiik, 2018a; Larsen, 2018; Redford, 2018); and the risk, alluded to above, of social scientific methods and knowledge simply being *co-opted* for pre-existing conservation agendas (see also Bennett & Roth, 2019, p. A16; Moon et al., 2019, p. 2). Against this backdrop, we asked, how could we collaborate productively across difference while respecting and exploiting our distinctive strengths? And how might this process reshape *both* conservation and the social sciences?

This article is our collective attempt to address these questions. Our discussion draws on and draws together several distinct

sources: (a) current scholarship on orangutans and orangutan conservation from across the natural and social sciences; (b) orangutan-related material in the public domain, such as social media posts and films, on which some co-authors (especially LC, HF and AP) have been carrying out discursive and visual analysis; (c) discussions during the December 2018 workshop, on which the GLO team (LC, HF, VS, AS, with PT) took extensive notes, and entries in a 'comments and reflections' notebook circulated during the workshop; and (d) the authors' personal observations and experiences during our own work and research (including ongoing, unpublished observations by the GLO team).<sup>2</sup> We begin with a state-of-the-field review of trends and developments in orangutan conservation—focusing on recent approaches to its many, relatively under-studied social, political and other human dimensions. Building on our experiences and the workshop discussions, we then identify some key concerns and challenges that run through this field. Finally, we consider how orangutan conservation in particular, and the conservation–social science relationship in general, can move forward through concerted dialogue and collaboration. Such a project, we argue, does not simply entail finding better ways of using the social sciences in and for conservation. Rather, it requires both conservationists and social scientists to remain open and committed to reflexivity, critique, and mutual transformation—sometimes in fundamental and destabilizing ways.

Before proceeding, however, we must address a basic question: who and what does 'the conservation–social science relationship' refer to in this paper? In the extant literature, the terms 'conservation' and 'social science' cover broad churches and are differentiated and combined in multiple ways. For example, Bennett, Roth, Klain, Chan, Christie, et al. (2017) and Bennett, Roth, Klain, Chan, Clark, et al. (2017) recommend integrating social scientific methods and research into conservation policy and practice, whereas Sutherland et al. (2018) focus on the instrumental deployment of qualitative methods in ecological and conservation research. On a more critical, reflexive note, Bennett and Roth (2019), Moon et al. (2019) and Sandbrook et al. (2013) advocate using social scientific lenses to interrogate and transform the most basic premises of both conservation research and action.

Like these authors, we approach conservation and the social sciences as broad—and broadly divergent—fields of thought, values, structures and actions. However, as the above writings reveal, these fields are not 'monolithic' entities populated by 'identical practitioners' (Redford, 2018, p. 231). Rather, they encompass a tremendous variety of approaches, frameworks, agendas, and practices, as well as diverse groups and individuals, such as natural and social scientists working in academia, natural and social scientists working in/for conservation organizations, and conservation practitioners with varying backgrounds and qualifications in different parts of the world. The above distinctions, however, are neither inevitable nor watertight: for example, research and practice often feed into each other, particularly when implemented within an adaptive management framework (e.g. Gardner, 2010;

Nichols & Williams, 2006), and individuals (such as conservation social scientists) routinely move across or straddle different roles and fields.

With such diversity and fluidity in mind, our paper works at two levels. On one level, it centres on the relationship between two key groups within conservation and the social sciences: (a) conservation scientists, many of whom also formulate policies and strategies and lead or run conservation projects and (b) social scientists who study conservation and its wider milieus (e.g. cultural norms, land rights, human–environment relations)—often, but not only, from outside conservation. These two categories reflect our own positions and respective relationships to conservation—as conservation scientists and strategists on the one hand, and academic social scientists on the other. We thus write less as representatives of 'conservation' and 'social sciences', and more from our subject-positions within these fields in a bid to shed new light on the socio-cultural, political and economic complexities of orangutan conservation. It is important to note, however, that we are not claiming a privileged view over other conservationists or social scientists, particularly the Indonesian and Malaysian professionals with whom many of us have worked closely for years. Rather than trying to speak for orangutan conservation as a whole, this article fleshes out a set of reflections and ideas that emerged out of the December 2018 workshop.<sup>3</sup>

On another level, however, we argue that our specific collaboration can speak to wider concerns in and across both broad fields. For example, social scientists' recommendations for engaging seriously with rural communities' priorities can inform not only conservation scientists' research but also the on-the-ground work of conservation practitioners, such as outreach officers and conflict mitigation teams. Similarly, our joint reflections on methods and spaces of cross-disciplinary engagement may feed into the cross-sectoral work conducted by social scientists working in conservation—particularly their efforts to mediate between scientists, policymakers, NGOs and multiple local stakeholders (see, e.g. Kovács, Fabók, Kalóczkai, & Hansen, ; Waters, Harrad, Bell, & Setchell, 2019). In short, while this article has emerged out of a specific collaboration, it also seeks to generate new critiques of and possibilities for the wider fields of which it is part. Accordingly, we aim throughout to draw out the implications of our discussions for conservation, social sciences and the relationship between them.

## 2 | CURRENT DEVELOPMENTS IN ORANGUTAN CONSERVATION: A STATE-OF-THE-FIELD REVIEW

Like other forms of wildlife conservation, orangutan conservation has never been solely about orangutans. Rather, it involves a sprawling, dynamic, multi-scalar nexus of humans, animals, forests, institutions, ideas, beliefs, values and resources. In this section, we explore how ecological research and conservation strategies are increasingly foregrounding human factors in

orangutan conservation, precipitating shifts in knowledge, policy and practice. Following a brief overview of developments in orangutan conservation science (section 2.1), we turn to two less well-studied areas: current strategies for engaging multiple human stakeholders in orangutan conservation (section 2.2); and social scientific studies for and on orangutan conservation (section 2.3). Drawing all these analyses and insights into a single article allows us to trace the links between different facets of orangutan conservation, and appreciate how humans, orangutans and their environments are inextricably entangled at multiple levels.

## 2.1 | Orangutan ecology and population: Recent trends

There are three extant species of orangutans—two in Sumatra (*Pongo abelii* and *P. tapanuliensis*) and one in Borneo (*P. pygmaeus*). All are currently classified by the International Union for Conservation of Nature (IUCN) as Critically Endangered (Ancrenaz, Gumal et al., 2016; Nowak, Rianti, Wich, Meijaard, & Fredriksson, 2017; Singleton, Wich, Nowak, Usher, & Utami-Atmoko, 2017), as all have undergone rapid recent population declines. In the Pleistocene, orangutans were distributed over a much larger area, including mainland South-East Asia. Their disappearance from this vast area was likely due to a combination of hunting by modern humans and climate change associated with the colder and drier conditions during the Last Glacial Maximum (Spehar et al., 2018).

Currently, the main threats to orangutan survival are forest loss and hunting. Forest loss in the orangutan distribution range is driven by a multitude of factors, such as fire, agriculture, pulp and paper, logging, mining and infrastructure (Austin, Schwantes, Gu, & Kasibhatla, 2019). Hunting for food used to be, and possibly still is, widespread on Borneo and in the area where the Tapanuli orangutan occurs, whereas killing due to human–orangutan conflict occurs in the range of all three species (Davis et al., 2013; Meijaard, Buchori, et al., 2011; Wich et al., 2012).

Orangutans are forest animals, living at low densities, and until recently were generally considered to be ecologically sensitive species that are significantly affected by human disturbance. Recent studies, however, indicate that this picture may be partially incorrect (Meijaard, 2017; Spehar et al., 2018). Orangutans can survive (at least in the short term) in human-dominated landscapes, such as oil palm and acacia plantations, forest gardens and other farming areas interspersed with forest patches (Ancrenaz et al., 2015; Campbell-Smith, Campbell-Smith, Singleton, & Linkie, 2011; Meijaard et al., 2010; Sapari, Perwitasari-Farajallah, & Utami Atmoko, 2019), if conflict with and killing by people can be avoided or mitigated (Campbell-Smith, Sembiring, & Linkie, 2012; Campbell-Smith, Simanjanrang, Leader-Williams, & Linkie, 2010; Davis et al., 2013). Human–orangutan conflict takes multiple forms and has changed over time. Much of it currently stems from orangutans being displaced by deforestation and industrial land-conversion and entering areas of anthropogenic activity, including residential areas, farms and gardens, fruit trees on

customary land, and industrial plantations. Responses to such encounters vary: orangutans may be chased away, wounded or killed, and sometimes captured and beaten in retaliation for damage caused. In areas where orangutan rescue and conflict-mitigation units are active, villagers and plantation workers may also request pre-emptive translocations of orangutans spotted nearby, prior to the occurrence of actual conflict (Sherman, Ancrenaz, & Meijaard, 2019).

There is virtually nothing known about the proportions and sizes of the various land cover types in relation to orangutan survival (but see Voigt et al., 2018). Orangutans, at least on Borneo, also appear to be more terrestrial than previously thought (Ancrenaz et al., 2014), but they may avoid going to the ground when people are near because of increased risks of being detected and killed (Spehar et al., 2018). It appears that at least some of the behaviours seen in orangutans today are the result of long-term predation pressures from humans over the c. 75,000 years that orangutans and modern humans have coexisted (Spehar et al., 2018).

These scientific insights have consequences for orangutan conservation strategy development. If, from an ecological perspective, the species can survive in disturbed and human-dominated landscapes, a key management focus should be to minimize the killings that occur in landscapes where people and orangutans frequently meet, and to protect all remaining forest patches—large and small. A good example of this is the Lower Kinabatangan landscape where for the past few decades there have been very few killings because of cultural reasons. Orangutans survive there in highly fragmented forest areas embedded in an oil-palm-dominated landscape, although populations are in decline because sub-adult males leave their natal ranges and disperse through the oil palm landscape (Ancrenaz & Lackman, 2014).

Recent population trend studies indicate that killing—whether through hunting, poaching or conflict—is one of the key drivers of orangutan extinction on Borneo, with the largest absolute declines noted for areas where no or limited deforestation is taking place (Santika et al., 2017; Voigt et al., 2018). These insights are not yet widely accepted in the orangutan conservation community (Sherman et al., 2019). Nevertheless, with the large majority of orangutans in Borneo and a significant proportion in Sumatra (Wich, Riswan, Refisch, & Nellesmann, 2011) occurring in non-protected areas where they frequently encounter people, it is obvious that conservation solutions are required that effectively incorporate these people, their socio-cultural norms and their economic concerns (e.g. Sheil et al., 2006).

## 2.2 | Engaging people in orangutan conservation

In this section, we explore some strategies through which orangutan conservationists have engaged with two key sets of human stakeholders: communities in Borneo and Sumatra, and members of the public in the Global North. These have evolved and proliferated over the last few decades, sometimes leading to quite different ends.

### 2.2.1 | Community engagement in Borneo and Sumatra

Efforts to better understand people's views about and knowledge of orangutans date back to naturalists such as Alfred Russel Wallace (1989 [1869]) and Eduardo Beccari (1986 [1904]), who both leaned heavily on information from rural communities on Borneo, and clearly understood the influence people had on orangutan abundance. The development of conservation biology in the late 1970s (Soulé & Wilcox, 1980), however, shifted the focus of studies to a more ecological interpretation of the species, leaving less room to consider people as an integral part of the orangutan's landscape and a driver of its abundance and behaviour (Meijaard, 2017).

The influence of this eco-centric approach is, in our experience, still evident in much contemporary orangutan conservation. Up to recently, many people working in biodiversity conservation were (or began professional life as) biologists (Adams, 2007), and often had minimal training in social sciences and the humanities (Fisher, Balmford, Green, & Trevelyan, 2009). Reflecting this demographic composition, orangutan conservation strategy development has generally started by asking 'what do the orangutans need to survive and breed?', often via research led by (foreign) biologists (Meijaard, Wich, Ancrenaz, & Marsall, 2012, p. 9). These same biologists then provide recommendations regarding how human behaviour or policy can be changed to address the orangutan's needs (ideally also providing co-benefits to local communities). Social scientists, local conservationists and policy experts are subsequently brought in to help deliver these strategies, rather than being intrinsically involved in overall strategy development from the outset (Meijaard et al., 2012, p. 9). Yet, an orangutan-focused narrative is not always appropriate for engaging the support and cooperation of local people with direct forest connections.

For example, the Sebangau forest in Central Kalimantan is home to the largest protected contiguous population of the Bornean orangutan (Morrogh-Bernard, Husson, Page, & Rieley, 2003; Utami-Atmoko et al., 2017)—a major reason underlying its establishment as a national park that generates high national and international interest. Despite this, research conducted in two villages neighbouring Sebangau indicates that local community members perceive fish as being far more important than orangutans, which ranked behind green leaf birds (*Chloropsis* spp.) and roughly level with hornbills in terms of perceived importance (Thornton, 2017). This relates to the fact that fishing is a key source of local income and dietary protein in rural communities in many parts of Kalimantan (Schreer, 2016; Thornton, 2017), that green leaf birds are widely sold as songbirds in local markets (Mark E. Harrison & Susan M. Cheyne, pers. obs.) and that hornbills play an important part in Dayak culture, and are also commercially traded (e.g. Beastall, Shepherd, Hadiprakarsa, & Martyr, 2016).

This Sebangau research suggests that forest conservation messages focusing on fish may be more likely to gain local traction and support than messages focusing on orangutans (Thornton, 2017). Furthermore, although no empirical information exists, some local people perceive that dams constructed to help restore flooded

wetland conditions and prevent fire in peat-swamp forests (a habitat in which there are frequent orangutan conservation actions) impact negatively on local fish populations, which may therefore lead to local opposition to orangutan conservation efforts (Thornton, 2017). With this context in mind, the Borneo Nature Foundation (BNF), which works to protect orangutans and other wildlife in the area, is seeking to mitigate local villagers' concerns about the impact of canal damming, while also using concerns about fish and fishing as a bridge between local and conservation concerns (see, e.g. BNF, 2019).

These findings reflect a growing recognition that it is impossible to solve orangutan conservation problems without taking seriously the opinions, experiences and concerns of the people who live in, around, and near orangutans and their habitats (Ancrenaz, Dabek, & O'Neil, 2007). Indeed, the inclusion and well-being of local people is now widely seen as necessary for the legitimacy and success of conservation, and an important goal in itself (Berkes, 2012; Ostrom, 1990; Sheil et al., 2006; Vermeulen & Sheil, 2007). Current human-focused strategies in orangutan conservation include the following: communication and education programmes that align national, local and conservation goals (e.g. orangutans as national assets; protecting forests to ensure clean air and water); linking health provision to protection of orangutan habitat (e.g. preventing forest fires to reduce haze pollution); outreach programmes seeking to change negative perceptions of orangutans; programmes for mitigating human-orangutan conflict (e.g. showing farmers how to chase away orangutans or protect crops); and development projects that bring jobs, education, tourism and infrastructure to local communities, while benefiting orangutans through forest protection and the reduction of killing. Some Indonesian and Malaysian organizations are also deploying social media to raise awareness of orangutans and environmental issues among urban internet users, and to organize virtual and in-person action in support of orangutan causes. For example, the Twitter hashtag #orangutanbukanmainan ('orangutans are not toys') has been used since 2013 to name and shame attractions and celebrities that treat orangutans as pets or entertainers (L. Chua, pers. obs.).

Such efforts are built around ideals about community engagement and 'empowerment'—the (sometimes problematic) implications of which we address below. It is worth emphasizing, however, that many such programmes do not focus exclusively or even primarily on orangutans, but, rather, have adapted to the broader concerns of people on the ground. In this respect, they make a striking contrast to engagement programmes in the Global North, which tend to be overwhelmingly orangutan-centred.

### 2.2.2 | Outreach and engagement in the Global North

Orangutan-related projects have long relied on monetary, moral and political support from audiences in the Global North—for example,

readers of *National Geographic*, viewers of television programmes like *Orangutan Jungle School* (2018–) and *Red Ape* (2018), attendees at fundraising events, eco-tourists and volunteers. In recent years, these efforts have been exponentially boosted by internet-based platforms, many of which enact new possibilities for engagement (Chua, 2018a, 2018b). For example, events such as International Orangutan Day and Orangutan Caring Week (<http://www.worldorangutanevents.org/events.php>) are largely virtual occurrences that use social media's viral properties to increase support for and participation in orangutan-related causes.

Such digital activities, however, can also generate complications. For example, the UK supermarket chain Iceland's Christmas 2018 advertisement—built almost entirely around Greenpeace's animation, *Rang-tan: the story of dirty palm oil* (2018)—garnered over 65 million views in the month after its release on YouTube (Hickman, 2018). This was abetted by the fact that the advertisement was not cleared for screening on British television because it used content created by a political body, that is, Greenpeace. Iceland's CEO swiftly announced on Twitter that its ad had been banned because it was 'seen to be in support of a political issue' (<https://twitter.com/IcelandFoods/status/1061204817257918464>), with instantaneous effect (Chua, 2018c).

*Rang-tan* uses a conversation between a baby orangutan orphaned and displaced by oil palm-driven deforestation and a girl into whose bedroom it has escaped to highlight the destructive impacts of palm oil, and precipitate consumer action to 'stop palm oil destroying the rainforest'. In turn, Iceland used this to publicize its commitment to removing palm oil from its own-brand products by the end of 2018. The advertisement received extensive social and mainstream media coverage, stimulating an international conversation about the link between palm oil, rainforest destruction and orangutan extinction. Schools across the UK used the film in their lessons, the World Wildlife Fund saw a 300% increase in orangutan adoptions that year (The Times, 2019), and various public figures took to social media calling for an all-out boycott of palm oil. This emotive injunction, however, glossed over numerous ecological and socio-economic complexities in oil palm-growing contexts (e.g. Meijaard, Morgans, Msi, Abram, & Ancrenaz, 2017; Meijaard & Sheil, 2019), undermining many orangutan organizations' stance—to advocate for sustainability in the palm oil industry rather than a total boycott.

A different example of orangutan-related outreach is the citizen science project, Orangutan Nest Watch (<https://www.zooniverse.org/projects/sol-dot-milne/orangutan-nest-watch>), which invites volunteers around the world to identify orangutan nests and strangler fig trees (*Ficus* spp.—an important fallback food source for orangutans) in aerial images taken by unmanned aerial vehicles (UAVs) in a large-scale aerial survey in Sabah, Malaysia. Volunteers are shown aerial photos of different land use types, from riparian forest reserves in oil palm plantations to unlogged primary forest, and assist the study by visually searching for orangutan nests and fig trees present in the aerial survey. By viewing images randomly, volunteers get a window onto the habitats

in which orangutans can be found as well as the current state of human-modified forests.

The primary aim of Orangutan Nest Watch is to harness citizen science to improve scientific analyses of orangutan population density, while also making conservation more widely accessible to the general public. However, one knock-on effect of the project has been to demonstrate to non-specialists the importance of a wide variety of forest types for orangutans' survival, particularly by showing how degraded forests across a gradient of recovery can also be vital habitat for orangutans (S. Milne, pers. obs.). This can help challenge the simplified view (often spread via social media) of human-modified landscapes as simply 'bad', showing that effective conservation practices need to take into account the often unavoidable presence of people within a landscape. By putting the public into the frame of current scientific research and information about orangutan habitat into the public domain, Orangutan Nest Watch can generate more nuanced understandings of the ecological value of degraded forests and other anthropogenically modified landscapes for orangutans. In this way, it also has the potential to generate public interest in and support for a wider range of conservation strategies.

## 2.3 | Social scientific research for and on orangutan conservation

Having described orangutan conservation strategies for engaging people on the ground, we now turn to social scientific research on the multiple human dimensions of orangutan conservation. While some studies are useful for conservation in a utilitarian sense, others can also yield productive, critical insights on conservation (Sandbrook et al., 2013).

### 2.3.1 | Social science research for orangutan conservation

Community engagement programmes are often shaped by the practical experience of conservation managers and workers on the ground. However, they are also increasingly informed by 'social research'—focused studies conducted by or for conservation scientists that centre on specific conservation problems, for example, human–wildlife conflict. One such study was a 2008–2009 Kalimantan-based survey carried out by a consortium of 20 non-governmental organizations (NGOs) in 687 villages in a bid to understand villagers' socio-economic and cultural conditions and their perceptions of and relations with orangutans. In each village, 10 respondents with knowledge of orangutans were asked about forests, forest use and orangutans (Meijaard, Buchori, et al., 2011). This survey allowed for extraction of broad spatial patterns in people's perceptions of orangutans and the different threats that the orangutans faced (Abram et al., 2015). It also provided evidence about the prevalence and distribution of human–orangutan

conflict and orangutan killing, the spatial correlation with land use types, and the different reasons for killing orangutans (Davis et al., 2013; Meijaard, Buchori, et al., 2011). Concluding that killing was a major threat to orangutans in Kalimantan (Meijaard, Buchori, et al., 2011, p. 9), the paper argued for more targeted anti-killing measures that would take into account key variables in shaping human–orangutan relations, such as ethnicity, religion and forest use.

Similar research has been carried out on human–orangutan conflict in Sumatra. Studies have revealed that other primates are considered to cause more damage to crops than orangutans (Marchal & Hill, 2009), and that the fear of bodily harm significantly determines farmers' tolerance of orangutans entering their areas (Campbell-Smith et al., 2010). It has further been shown that human–orangutan conflict mitigation interventions, although costly, labour-intensive, and not always effective, could improve farmers' perceptions of orangutans and their conservation (Campbell-Smith et al., 2012). Meanwhile, ethnographic research around Danau Sentarum National Park, West Kalimantan, has revealed the importance of local beliefs and taboos in affording orangutans some protection from hunting (Wadley & Colfer, 2004; Wadley, Colfer, & Hood, 1997; Yuliani et al., 2018).

These studies provide rare and much-needed glimpses into the lives of people who coexist with orangutans. However, their broader insights are circumscribed by their narrow topical focus and policy-oriented framing. A further challenge is thus to connect their findings with a wider body of ethnographic literature on socio-cultural relations and environmental transformations in these areas (e.g. Brosius et al., 2005; Dove, 2011; Eilenberg, 2012; Gönner, 2002; Ibrahim, 2015; Lumenta, 2011; Padoch & Peluso, 2003; Puri, 1999, 2005; Tsing, 2005; Wadley, 2005; Wadley, Colfer, Dennis, & Aglionby, 2010; Widen, 2017) as well as the work of regional centres, such as Institut Dayakologi (West Kalimantan), which promotes Dayak cultural revitalization through research and publications. Although these rarely address orangutan conservation directly, they can provide vital contextual information on the larger structures and processes that affect both orangutans and people. In this capacity, they may also offer different slants on orangutan conservation—for example, by illuminating village-level political relations or moral dictates that influence people's responses to conservation.

### 2.3.2 | Social scientific research on orangutan conservation

More than shedding light on the contexts surrounding orangutan conservation, social scientific research can illuminate the day-to-day workings of orangutan conservation itself. For example, Louchart's (2014, 2017) ethnography of the Borneo Orangutan Survival Foundation's Nyaru Menteng Centre (Central Kalimantan) examines how rehabilitation involves the paradoxical attempt by humans to reconstruct animal purity by teaching orangutan orphans

to be authentically 'wild'. By contrast, Parreñas' (2018) monograph on orangutan rehabilitation in Sarawak draws a parallel between displaced orangutans and displaced Indigenous people, particularly women, who work at 'Lundu' wildlife centre. Grounded in feminist and postcolonial theory, it uses the concept of 'arrested autonomy' to explore how the hope of autonomy, as promised by rehabilitation for orangutans and steady wages and material improvement for humans, serves in practice 'as a means to continue enforcing [both parties'] dependency' on external, often neo-colonial, forces and organizations (2018, p. 155).

The relationship between indigenous rights and orangutan conservation in Indonesia is also interrogated by Perez (2010). She concludes that attempts to combine the two are often counterproductive, due to conflicts between Dayak and conservation NGOs' aspirations and understandings of nature, and local resentments regarding the compassion and funding 'for the orangutan, but not for the orang [person] Dayak' (2010, p. 150; see also Meijaard & Sheil, 2008). A similar critique is levelled by Rubis and Theriault, who—drawing on Rubis' experience of working in orangutan conservation in Sarawak—note how 'environmental conservation projects often draw heavily on the knowledge and labor of Indigenous communities' (Rubis & Theriault, 2019, p. 2), yet routinely erase their contributions to conservation while perpetuating their political and scientific marginality. This critique dovetails with current efforts to decolonize conservation (e.g. Aini & West, 2018; West & Aini, 2018), which demand fuller and more open-ended recognition of non-Western epistemologies, ontologies and agencies. Inequality and power relations are also central to Soeharso's (2014) ethnography of orangutan rehabilitation in Central Kalimantan. Importantly, he reveals how speaking broadly of 'state authorities' and 'conservation NGOs' can mask the complexity within each group: as he demonstrates, internal perspectives and motivations are diverse and often conflicting. In particular, Soeharso highlights disagreements between two prominent conservationists based in Central Kalimantan about the practice—and, in some sense, the purpose—of orangutan rehabilitation.

The above analyses focus on indigenous and other local communities, and—reflecting broader trends in the social sciences—often take critical views of the structural conditions, assumptions and practices of conservation organizations and initiatives. In so doing, they can sometimes 'misrepresent [conservationists as part of a] homogeneous, impersonal' mass (Kiik, 2018b, p. 1). However, Soeharso's work reminds us that, like much contemporary conservation (e.g. Braverman, 2015; Lowe, 2006; Scholfield, 2013), orangutan conservation is highly heterogeneous, filled with different players, viewpoints, models, priorities and positions. In recent years, some research has sought to move beyond reductive portraits of orangutan conservation itself. Ruyschaert and Salles (2018), for example, explore the diverse strategies of conservation NGOs—including several involved in orangutan conservation—for engaging with the Roundtable on Sustainable Palm Oil (RSPO). Similarly, Palmer (2018a, 2018b) examines how, facing scarce space and resources, orangutan conservationists weigh up numerous competing interests,

negotiating their ethical dilemmas with reference to established ethical frameworks (e.g. conservation and animal welfare/rights), pragmatic constraints, interpretations of orangutan behaviour and biology, and personal experiences and emotion. She demonstrates that ethical stances are complex and diverse across the orangutan conservation sector, with notions of human–animal continuity and difference shaping individuals' decisions about not just *why*, but also *how* to save orangutans.

Complementing these studies are humanities and social science discussions of Western perceptions of orangutans. Dobson (1953) and Cribb, Gilbert, and Tiffin (2014) trace the history of orangutans in Western imaginations since the 17th century, exploring debates about the orangutan's status in relation to humans, its appearance in exhibits, literature, and performance, and contemporary discourses of conservation and animal rights. The authors also consider Western representations of Borneo and Sumatra, and the relationships between Indigenous peoples and orangutans—a subject taken up, too, by Knapman (2008), who argues that 19th-century British travellers' accounts reinforced colonial racial hierarchies, associating Dayaks with orangutans, closer to nature and savagery than civilized Europeans (see also Dobson, 1953).

Moving into the present, Sowards (2006) explored how environmental groups and primatologists' rhetorical strategies foster positive identification with orangutans, turning the red ape into a 'powerful bridge' between the realms of human and animal that helps 'destabilize nature/culture dualisms' (2006, pp. 58–59). Similarly, Russell (1995) examines how Western ecotourists typically regard orangutans as either child-like or pristine and wild, with the former narrative minimizing and the latter emphasizing species differences. Russell and Ankenman (1996) explore ecotourists' engagement with orangutans as 'photographic collectibles', examining how photography constructs a certain kind of experience and narrative of the ecotourist experience. More recently, Chua (2018a, 2018b) has explored the interplay between contrasting perceptions of the orangutan (cute and cuddly vs. wild and not human) on Western social media, looking at how this shapes users' social and ethico-political interactions.

Looking further ahead, it is apparent that the internet is, for good or ill, becoming a major source of information (i.e. big data) on public opinion, social trends and cultural values that will be of relevance to conservation. Sutherland et al. (2018) note that such data may help us understand the causes of support for, as well as impacts of, particular issues and campaigns (e.g. *Rang-tan*), but that they also might be used by those trying to counteract such actions. The emerging field of 'conservation culturomics' promises an opportunity for collaboration between social scientists and conservationists to explore the value of 'big data' to track public opinion for and against conservation (e.g. Correia, Jepson, Malhado, & Ladle, 2016), and to develop tools for its critical analysis and interpretation.

Finally, complementing studies of conservation organizations' media and rhetorical strategies is Fair's current research on the offline lives of Western supporters, particularly orangutan 'adopters' (Fair, 2019). Her work traces the diverse roles orangutan

adoption plays in supporters' lives: as an accompaniment to palm oil boycotts, as part of the cultivation of a digital menagerie or as a means of bolstering familial bonds through shared trans-species compassion. Further ethnographic investigation is still needed, however, to fully understand the motivations and practices of supporters. When complete, this research can inform orangutan charities' practices and enable more effective supporter engagement, resolve debates about the relationship between rehabilitation funding and broader conservation practices (Palmer, 2018b, p. 58), and suggest means of generating trans-species compassion and concern beyond the orangutan.

### 3 | KEY CONCERNS AND CHALLENGES: A SYNTHETIC DISCUSSION

As this review suggests, orangutan conservation is a 'wicked problem' (Game, Meijaard, Sheil, & McDonald-Madden, 2014; Redford, Adams, & Mace, 2013) that lacks clear or singular solutions. However, most orangutan conservation efforts have hitherto focused on species and forest protection, with many designed by (foreign) natural scientists and implemented by practitioners who are not fully equipped to deal with complex social and political realities (Harrison et al., 2019; Meijaard et al., 2012, p. 9). Such approaches have detrimental impacts on local livelihoods (e.g. Jewitt, Nasir, Page, Rieley, & Khanal, 2014). In our experience, this problem is compounded by the often circumscribed or superficial use of social scientific methods in orangutan conservation and limited engagement between conservationists and social scientists working in the same region, such as anthropologists of indigenous Bornean societies. This is not uncommon in conservation (e.g. Kovács & Pataki, ), but the question remains: what can we do about it?

One possibility is to find more effective ways of co-opting social science methods and knowledge *into* orangutan conservation policies, projects and organizations. However, there is a risk that, in being abstracted from social scientists, such methods and knowledge will prove only superficially useful (Bennett & Roth, 2019; Moon et al., 2019). The current article thus aims to show the value of sustained collaboration between conservation scientists, practitioners and social scientists—including those whose research may initially seem irrelevant or extraneous to conservation. In the next section, we collectively tease out three major challenges that face orangutan conservation as it grapples with today's complex, shifting anthropogenic realities. These challenges cut across different facets of orangutan conservation, pointing to the need for further cross-disciplinary and cross-sectoral exchange. At the same time, they point to wider challenges within conservation and the social sciences and the relationship between them.

#### 3.1 | Heterogeneity and multiplicity

A significant challenge in orangutan conservation involves working with and across difference. This is most prominently manifested in

the relationship between conservation organizations and rural communities in Borneo and Sumatra. Some communities (e.g. certain Iban groups; Sidu et al., 2015) have traditionally had special relationships with orangutans, in the same way that other communities share specific mythical or ritual connections with nonhuman entities, including birds, snakes, crocodiles, hornbills and mousedeer (e.g. Chua, 2009; Howes, 1952). However, most rural villagers do not see orangutans as exceptional. Nor do they always share conservationists' concerns about urgently needing to save them. Rather, on a day-to-day basis, villagers are often more interested in other animals (e.g. fish, pigs, hornbills), as well as with livelihood strategies, land rights, and access to forests, amenities and infrastructure. Consequently, orangutan conservationists have to find ways of translating their messages—and justifying their presence—across linguistic, cultural and social boundaries.

Difference, however, can also be found *within* the parties that participate in orangutan conservation. 'Local stakeholders', for example, is a broad term that encompasses multiple groups and identities: in Kalimantan, one can find Indigenous Dayaks, Malays, Javanese transmigrants and Chinese living in and around orangutan habitat. These groups tend to respond to orangutans and conservationists in different ways (e.g. Meijaard, Mengersen, et al., 2011). Variations within communities—gendered roles, religious affiliations, political networks and land ownership, for instance—also impact how groups and individuals engage with conservation and other initiatives. In this respect, a challenge for conservationists is ensuring that their efforts do not exacerbate existing conflicts or create new inequalities and fault-lines (e.g. Santika et al., 2019).

On the flip side, it is vital to acknowledge heterogeneity within conservation (Kiik, 2018b). Conservation bodies have different (if overlapping) objectives, agendas, strategies and methods, as well as varied obligations to their funders, other conservationists, the scientific community and governments. There are also significant differences between individuals working in conservation—notably between foreign, relatively powerful figures and their local counterparts, as well as between Malaysian or Indonesian urbanites and low-wage workers from rural areas affected by orangutan conservation. Tensions between their varied concerns and agendas can cause significant problems for conservation interventions on the ground.

Finally, orangutan conservationists have the challenging task of relating their work to various parties in urban areas and the Global North, particularly the media and supporters of orangutan causes. As explained above, the images and narratives that dominate popular Western engagements with orangutan conservation are markedly different to those used in Borneo and Sumatra: focused on charismatic individual orangutans while demonizing faceless corporate oil palm villains (Chua, 2018a) and erasing the presence of Malaysian and Indonesian oil palm smallholders (who would be disproportionately affected by anti-palm oil campaigns). These make an interesting contrast to Indonesian social media efforts, which sometimes link ideas of care for orangutans to invocations of national pride (L. Chua, pers. obs.).

In sum, heterogeneity and multiplicity are defining features across the global and local nexus of orangutan conservation. Indeed, they are arguably important enablers of conservation, facilitating its occurrence across national, cultural and other boundaries. For example, an orangutan-centred anti-palm oil campaign in the UK might cause a spike in donations to an orangutan organization, which then channels those funds into community engagement programmes in Kalimantan that hardly mention orangutans. At the same time, however, these differences raise thorny questions. Chief among these is the issue of the politics and hierarchies of difference. Many of the heterogeneities at work in orangutan conservation are not only cultural (as they are often portrayed) but also hierarchical, inflected by lingering (post-)colonial inequalities, governance and politics (Adams & Mulligan, 2003; Parreñas, 2018; Rubis & Theriault, 2019). For example, a European director of an orangutan organization, a conservation manager from Jakarta and a Dayak conservation worker from Kalimantan are all 'conservationists', but their status, power, salaries and influence are by no means equal.

Moreover, conservation interventions are often framed by a widespread tendency to respond to Indigenous and other non-Western knowledges by (a) systematically downplaying their legitimacy and viability as modes of conservation (Diamond, 1992; Kay, 1994; Krech, ); (b) overly romanticizing indigenous knowledge and expecting indigenous communities to remain unchanged over time (see Brosius, 1999; Ellen & Harris, 2000; Li, 1999); or (c) making such knowledge abstract, rendering it as mere 'data' removed from its original integrated and emplaced context, to be ignored or re-configured to fit the contemporary conservation framework. The politics and governmentality of incorporating such knowledges into policy thus typically marginalize Indigenous and other non-Western people and their perspectives on how their knowledge could be applied (Nadasdy, 1999). This can lead to a double marginalization for Indigenous and other non-Western conservationists, whose knowledge and labour are routinely downplayed or erased from scientific publications and conservation policy (Rubis & Theriault, 2019).

The challenge here is thus not simply how to juggle different differences as if they are all equal. Rather, it is vital to recognize the *politics* of difference; the ways in which certain elements (e.g. international scientific publications) are privileged while others (e.g. indigenous conservation practices) are delegitimized or marginalized. Related to this is the need for more concerted acknowledgement of the trade-offs demanded by orangutan conservation, the practical difficulty of realizing win-win solutions (Jewitt et al., 2014; Hirsch et al., 2011; McShane et al., 2011)—and the need to think beyond such dichotomies. This requires serious reflection on where and when to (re)draw, and also erase, certain lines. Importantly, compromises should not only be made by the targets of conservation interventions—for example, when Dayak villagers are made to relinquish customary rights to their forests for 'a greater good' (forest preservation, orangutans, etc.). Conservation scientists and practitioners too need to grapple with 'hard choices' (McShane et al., 2011), such as if it might be justified to *not* rescue a captive orangutan from a village in the interest of maintaining long-term local relations.

While conservation agendas should aim to reconcile differences and generate maximal benefits, it is thus equally important to acknowledge the limits of such ambitions, and to have serious conversations—informed, too, by sources beyond conservation—about how to deal with them in practice. This does not mean assuming that conflict with/in local communities is normal and inevitable. Rather, we argue that foregrounding rather than glossing over such tensions and incommensurabilities, as well as the politics that inflect them, could foster more critical and creative responses to the challenges facing orangutan conservation today.

### 3.2 | Scales and contexts

A second key challenge is how to work with and on multiple scales and contexts in orangutan conservation. Both social scientists and conservationists routinely toggle between scales, from small villages to ecosystems and national borders to global and planetary processes. However, they often have different ways of understanding and dealing with the connections (or lack thereof) between them. Anthropologists, for example, can get bogged down in ethnographic particularities and be reluctant to extend their insights to other contexts. Conversely, conservation scientists and policymakers often think and work on larger scales, such as through landscape-level approaches involving multiple stakeholders. Inevitably, however, such sweeping perspectives cannot capture complex particularities on the ground, which can make or break conservation interventions.

Two key questions are thus as follows: (a) How can those who design and assess conservation policies and practices (e.g. conservation scientists, practitioners, social science analysts) engage in productive dialogue without falling prey to either hyper-particularism or overgeneralization? and (b) How do we strike a balance or, at points, choose between capturing complexity and taking a stand, whether through direct intervention or political statements? This is not a matter of different parties filling in differently scaled gaps (e.g. anthropologists explaining 'the local'; conservation biologists explaining landscape-level patterns). Rather, we must also interrogate the processes, mechanisms and politics through which both multi-scalar research and conservation operate (see, e.g., Fairhead & Leach, 1996).

One concern is the issue of when, how and how much contextualization is useful. For example, villagers may contextualize large-scale events (e.g. forest fires) with reference to local concepts and political relations (e.g. religious beliefs, relations with the state), while conservationists may contextualize specific occurrences (e.g. the killing of an orangutan) with reference to larger-scale developments (e.g. deforestation, oil palm, global capitalism). But while such processes enable translations between different parties, they can also have drawbacks. Over-contextualization can diminish the specificity of people's concerns: a villager concerned about orangutans eating his fruit or a British supporter who is emotionally invested in one adopted orangutan, for example, may find extensive commentary on complexities of oil palm cultivation off-putting. Conversely, too little contextualization can

generate misunderstandings and reductive simplifications, as happened with Iceland's Christmas advertisement, or when conservation outreach teams adopt a local idiom without fully grasping its moral and social implications (Eghenter, 2000).

Another challenge that arises from navigating multiple scales is extrapolation—a useful but complicated process regularly undertaken by conservation scientists, policymakers and social scientists. For example, estimates of orangutan population decline, forest loss and other trends can swiftly become the basis of policy and funding agendas, with concrete political, logistical and financial implications. Such estimates, moreover, are often repackaged as hard facts by activist organizations and the media, leading to regular, inaccurate and sensational (extrapolative) claims like 'orangutans will be extinct within ten years!' (Meijaard, 2017). Arguments can also become metonymic, that is, a form of extrapolation where one example is made to stand for entire topics or fields of study, thus leading to further extrapolation. This can happen, for example, when social scientists treat the practices of one centre as representative of all orangutan rehabilitation and reintroduction, when conservationists take social norms identified in one village as typical of all Bornean societies, or when activists use palm oil to stand for all the threats faced by orangutans. While extrapolation is thus an important enabler of research and conservation policy and practice, we must pay careful, critical attention to how and where it is used, as well as its possible consequences.

### 3.3 | Politics and political economy

Closely connected to the above challenges are the political dynamics that shape, and in many ways constrain, the work of conservationists and social scientists. The most obvious of these are local, national, and international political complexities in which orangutan conservation is entangled. The timescales of electoral politics and conservation planning, for a start, are radically different: whereas the first is usually concerned with short-term gain, public moods, and rapidly shifting priorities, the second requires much longer-term planning that may or may not align with contemporaneous political concerns (see also Harrison et al., 2019). National and regional geopolitics also play a major role in shaping the fate of orangutans—a recent example being the construction of a China-backed hydroelectric project, the Batang Toru Dam, which threatens to fragment and flood part of the habitat of the newly discovered Tapanuli Orangutan (Sloan, Supriatna, Campbell, Alamgir, & Laurance, 2018). On the ground, rescue and conservation work can be hampered (or at least complicated) by corruption, poor legal support and the actions of powerful individuals, including politicians and elites. And as detailed above, conservation schemes can map onto or be hijacked by existing political configurations at the local level, as well as generate new political dynamics, relations and tensions.

These political processes are complicated by the effects of international consumer pressures and industrial growth in Borneo and Sumatra. Both Indonesia and Malaysia are firmly committed

to developmentalist programmes that seek to modernize rural areas (e.g. Li, 2007), partly through engagement with global demand for commodities. The most prominent such example is palm oil, which has led to the rapid expansion of oil palm plantations across Borneo and Sumatra over the past two decades (Gaveau et al., 2019). Although the widespread claim that oil palm cultivation is the leading cause of deforestation and orangutan extinction in these areas is debatable (see, e.g., Ancrenaz, Meijaard, Wich, & Simery, 2016, table 1), its expansion has had significant implications for orangutan survival: habitat loss, degradation and fragmentation, as well as increased incidences of human–orangutan conflict. (In 2010, approximately 19% of Bornean orangutans' habitat lay in oil palm concession areas, Wich et al., 2012.) It has also had significant implications for orangutan conservation strategies, with some individuals and organizations increasingly finding ways to work with, rather than simply against, the oil palm industry (see, e.g. Ancrenaz, Meijaard et al., 2016). Such efforts are, moreover, shaped by increasingly politicized, and polarized, invocations of palm oil (Meijaard & Sheil, 2019, p. 2) as either a major environmental villain (Chua, 2018c) or a national asset that will reduce poverty and usher in a new era of development and prosperity (see, e.g., Malaysia's *Sayangi Sawitku* (Love my/MY [Malaysia] Palm Oil) campaign, <https://lovemypalmoil.com.my/>).

Another significant but rarely discussed factor is the political economy of conservation practice and academic research, which are often entwined in orangutan conservation. Facing limited resources, conservation scientists and practitioners must constantly navigate changing policies and funding agendas, which over time prioritize different kinds of knowledge or approaches (e.g. Brosius & Hitchner, 2010) and activities (e.g. Palmer, 2018b, Chap. 10). A major factor here is the crisis-oriented framework of contemporary conservation, which—in pressuring various parties to ‘save’ environments and biodiversity before it is too late (Büscher & Fletcher, 2018, p. 108)—can have profound impacts on conservation funding. For example, some workshop participants noted that funders prefer supporting quick behaviour-changing experiments rather than long-term educational programmes. Similarly, deep, meaningful engagement with local communities typically requires substantial time and financial investment, which may make implementation of such work by orangutan conservation organizations more difficult, given frequently (time-) limited grant funding pressures and related needs to demonstrate measurable impacts. This problem is compounded by the challenges of recruitment in a field characterized by short-term funding and positions, in which individuals are often unable or unwilling to commit to living and working in the same area for a protracted period.

An analogous situation exists for natural and social scientists working in contemporary academia, especially in the Global North, where funders and universities increasingly prioritize high-impact, ‘paradigm-shifting’ research with easily quantifiable outcomes (Shore, 2008). In the social sciences, for example, this emphasis on game-changing research can generate an intra-disciplinary politics of prestige and influence, and fuel an increasingly widespread tendency to engage in sensationalized or impressive-sounding

theoretical conversations that continually loop back on themselves. Moreover, despite the valorization of interdisciplinarity by research institutions, strongly interdisciplinary projects often prove difficult to fund (see, e.g., Bromham, Dinnage, & Hua, 2016). All these factors thus form barriers to the sorts of exchanges needed to push conservation forward: risky or experimental collaborations between natural and social scientists, for example, or long-term, incremental research-based reformulations of conservation policy and strategy.

In sum, politics and internal political economies play a significant, if often under-acknowledged, role in shaping the contours and possibilities of conservation-related agendas and research. However, neither conservation practitioners nor academics are necessarily well equipped to navigate such political dynamics. This is due, in part, to a tendency—common in both conservation and academia—to style themselves as apolitical or beyond politics (see, e.g., Büscher & Wolmer, 2007; Chua, 2018c). This self-portrayal, however, is itself *depoliticizing* and potentially enervating, and can sustain a deep-seated reluctance on the part of conservationists and academics to destabilize their own assumptions or enact genuine change. The challenge here is thus twofold: First, how do we work with, around, or against real-world political processes? And second, how do we confront the politicized parameters of our own fields, and at the same time give our work positive political traction?

## 4 | MOVING FORWARD

The previous section explored three overarching challenges facing orangutan conservation—and biodiversity conservation more generally—in a world increasingly defined and dominated by human activity. In the rest of this article, we collectively explore ways of addressing these challenges and opening up new possibilities. Although these centre on orangutan conservation and our particular collaborative relationship, we argue that they also hold wider lessons for conservation, the social sciences and the evolving relationship between them.

### 4.1 | Proxies

If a key question for orangutan conservation is how to deal with difference in multiple forms and on multiple scales, one corollary is: how feasible or desirable it is to reconcile differences, rather than let them be? One way forward, we suggest, is to make more concerted, creative (but careful) use of proxies, that is, keywords or issues that can stand for different parties' concerns and constitute a shared point of engagement between them. This can enable collaboration and conversation across difference while also respecting that difference (unlike the erasure of difference seen in cases of metonymy).

For example, as shown earlier, rural villagers in Borneo and Sumatra are often less interested in orangutans than in other

animals and wider concerns such as clean water, medical care and kinship obligations (Meijaard et al., 2012, p. 12). Conservation organizations commonly respond to such divergent interests by trying to educate people about orangutans and environmental issues, and/or using economic incentives to draw them away from environmentally damaging behaviour. Both these strategies operate through a logic of replacement—of ignorance with knowledge, of damaging behaviour with environmentally friendly behaviour. However, as BNF's experience (above) suggests, the use of proxies such as fish involves another logic: *commensuration*, which allows local communities and conservationists to align different agendas to achieve similar but not identical goals. A similar process of commensuration takes place in the Global North, with charities often using wild orangutans as charismatic proxies for the wider ecosystem and its myriad associated benefits/services. Moreover, proxies can generate productive new relations between seemingly opposed parties. For example, 'sustainability' has become a proxy in recent engagements between certain orangutan conservation organizations and oil palm corporations, standing for and encapsulating the former's concern with saving orangutans (e.g. by reducing deforestation and securing protected areas and corridors) and the latter's concern with corporate image and market access (see, e.g., Ancrenaz, Meijaard et al., 2016; Meijaard & Sheil, 2019, p. 10). In theory, at least, these engagements—fuelled by consumer demands for and regulations surrounding 'sustainable' palm oil—have opened up new possibilities for orangutan conservation that might otherwise not have existed.

Proxies can thus bridge multiple realms without forcing them into a singularizing conversation. Such a move, however, is inevitably risky and must be undertaken with caution. 'Sustainable' palm oil still presents problems and complications in reality (Ancrenaz, Meijaard et al., 2016; Chao, 2018; Meijaard et al., 2017; Meijaard & Sheil, 2019). And as Rubis and Theriault (2019, pp. 9–12) note, the power imbalances inherent in conservation make it easy for outsiders to project their own stereotypes (romantic or derogatory) on indigenous and other communities (see also Agrawal, 2002; Escobar, 1998). Furthermore, care must be taken to avoid misunderstanding or misusing the latter's conceptual idioms (Eghenter, 2000), and to acknowledge groups' and individuals' strategic agency as they navigate conservation's power structures. Discourses and concepts are never static, and individuals can shift between discourses as they move between contexts (Frost & Wrangham, 2003). For example, in a conservation workshop organized by NGOs and the state, the village headman might seem agreeable to solutions proposed by the organizers. Conversely, in private settings, he may voice his concerns about the loss of local autonomy in natural resource management.

Despite these caveats, the strategic use of proxies can be productive in situations involving significant, hard-to-reconcile, but potentially commensurable differences. It is here that conservationists and social scientists can work together on identifying proxies, mediating their role in interventions, and—importantly—mitigating against their careless or damaging use. Analogously, we suggest, such

principles could help move the conservation–social science relationship beyond critique and co-optation. Both critique and co-optation are arguably responses to difference: whereas the first tends to re-inscribe difference, the second seeks to erase it through the selective appropriation of methods and content. As our workshop revealed, however, there are ways of engaging productively with each other's fields and perspectives while respecting the differences between them (e.g. Gamborg, Parsons, Puri, & Sandøe, 2012; Sheil et al., 2003, 2006). Proxies, such as specific keywords (e.g. 'culture', 'technologies') around which discussions could coalesce, and indeed the figure of the orangutan itself, proved vital bridges between the workshop's participants, keeping the conversations moving without requiring participants to 'lose' their professional bearings or priorities. For these sorts of exchanges to become routine, however, a further step is required.

## 4.2 | Creating new shared spaces

The use of proxies to bridge but not nullify difference can be complemented by the creation of new, shared spaces. Importantly, this does not mean simply linking existing realms (e.g. through proxies) or encompassing one within the other (e.g. selectively deploying abstracted forms of 'indigenous knowledge' in conservation strategies). Rather, it means actively forging new sites of encounter that can facilitate interactions and understanding between multiple parties, knowledges and modes of being.

The use of aerial surveys in orangutan research (Section 2.2.2) is a case in point. Although these are mainly used to obtain distribution data and density estimates to more accurately monitor orangutan population trends, they have led to another, possibly unexpected, short-term outcome: enabling new modes of engagement between scientists and their local counterparts. More detailed than satellite imagery and less restricted than on-the-ground views, such drone visualizations created shared spaces of exchange and cooperation between the scientists involved in the project and communities neighbouring orangutan populations. The process of looking at the landscape together in real time and identifying shared referents that affect both humans and orangutans can generate local enthusiasm and interest in conservation (S. Milne and S. Wich, pers. obs.). However, it can also produce a new visual context that brings local concerns and ways of seeing and conservation interests into the same productive space.

Out of these spaces emerge various possibilities. For example, shared visualizations can form the basis of mixed landscape planning efforts that redress older, exclusionary models of 'fortress conservation'. Communities can also use drone technology and footage to inform their own land management strategies and to advance customary land claims, for example, through counter-mapping (e.g. Peluso, 1995; Radjawali, Pye, & Flitner, 2017). Moreover, as the Orangutan Nest Watch example suggests, new visual contexts can engender different ways of understanding and imagining forms of multispecies coexistence—in this case, by raising public awareness

of the capacity for orangutans to survive in anthropogenically modified forests. The bigger question that this citizen science project raises, then, is: how *else* might we conceive of the ways in which humans and orangutans could share each other's worlds (see also Meijaard, 2017; Parreñas, 2018; Spehar et al., 2018)?

Inevitably, these projects present their own challenges and complications, including ethical considerations about communities' privacy and safety, and the ever-present danger of local knowledge and concerns being abstracted or sidelined. Moreover, knowledge created in shared spaces can become reified and politicized—as sometimes happens when participatory mapping exercises lend a new fixity to otherwise fluid land boundaries, thus generating conflicts over ownership (Fox, Suryanata, Herschok, & Pramono, 2005, pp. 5–8). In this respect, it is important not to assume that increasingly popular agendas for the 'co-production' of conservation knowledge and policy (e.g. Luc Hoffman Institute, 2018) are inherently benign or unproblematic. As noted above and in various authors' experience (LC, JR, VS and PT), not all stakeholders—particularly those with problematic relationships to state bureaucracies—*want* to participate in conservation. For some, evasion, refusal and concealment may be key to protecting their rights and existence (e.g. Rubis & Theriault, 2019, p. 4), and it is vital that we recognize and respect such strategies.

These risks, however, should not blind us to the potential benefits of creating new, shared, equitable spaces for exchange and collaboration. This principle can also be productively applied to the conservation–social science relationship (see also Büscher & Wolmer, 2007, p. 14). For example, we suggest that it would be beneficial to create and hold open 'safe spaces' (as one workshop participant put it) for exchange that are momentarily removed from funding obligations, media and public scrutiny, and other pressures. Such spaces, we argue, can encourage conservation scientists, conservation practitioners and social scientists to better understand each other's perspectives, and facilitate more open and candid reflection, exchange, critique and experimentation. But for such spaces to materialize, it is vital that all parties also leave their comfort zones and echo chambers, and make their work comprehensible and relevant—not only to each other but also to other stakeholders in conservation, such as villagers, government officials, corporations and funders. In this respect, a further challenge will entail creating open-ended and non-judgemental spaces for non-conservation actors—including seemingly 'opposing' parties, such as multinational corporations—to engage with conservation. Again, this is a project in which social scientists can play an important role—both through ethnographic research (e.g. on the perspectives and experiences of officials and corporate staff members) and by mediating between different players, their perspectives and their priorities.

### 4.3 | Overhauling status quos

More than working across difference and creating shared spaces, we argue that conservationists and social scientists must remain open

to overhaul: to having their most basic assumptions and methods challenged and reworked. This cannot be achieved simply by working better with each other; rather, we also need to *work on* our own knowledges, practices and relations in potentially destabilizing ways. Such a commitment is inherently political in that it entails challenging established epistemological and moral edifices, as well as existing hierarchies and barriers.

A first step could be to rethink the morality, politics and pragmatics of our languages and concepts (Castree et al., 2014; Lahsen et al., 2015; Meijaard & Sheil, 2019). As shown above, widely used conservation concepts, such as 'local stakeholders', 'capacity building', 'threats', 'extinction', 'degraded' and 'failures' versus 'successes', are not straightforward, apolitical or universally shared. 'Local stakeholders' and 'capacity building', for example, can oversimplify on-the-ground heterogeneities and tensions—yet it is all too easy to tick these boxes on funding applications or grant reports without grappling with their complexities. Similarly, identifying something as a 'threat' can turn it into a legitimate category of conservation intervention. Yet, as studies of other conservation contexts reveal (e.g. Duffy, St John, Büscher, & Brockington, 2015; Hübschle, 2017; Massé, 2019), such categories can end up alienating and marginalizing people for whom such 'threats' (e.g. fire used in swidden agriculture, oil palm smallholdings or hunting for vital nutrition) have different and potentially beneficial implications. The same caution and critical awareness need to be extended to social scientific terms and devices, such as 'local' and 'Indigenous', 'marginalization' and '(neo)colonial', all of which are used in this piece. Such terms are routinely used to critique conservation, but they too are morally and politically loaded, and can obscure and simplify as much as they illuminate.

A second step is to continually revisit our baseline assumptions and objectives. Here, we flag some examples that emerged during our workshop. First, our exchanges precipitated the acknowledgement that to save the orangutan, conservationists may well need to *remove* it from certain conversations. Such a recognition is pragmatic and political but also philosophical and ethical. It destabilizes the species-centrism of orangutan conservation, pushing it to also take seriously its commitments and responsibilities to humans and other species. Conversely, the social scientists in the room were presented with the challenge of how to transcend the limits of anthropocentrism—that is, how to pay analytical, ethical and political attention to the non-human entities and processes that also shape our field sites (see also Kiik, 2018a; Ogden, Hall, & Tanita, 2013; Parreñas, 2018).

More fundamentally, our discussions generated conflicting responses to the question of what orangutan conservation's endpoint even was: Saving a species at all costs? Preserving forests, with or without economic growth? Promoting more sustainable and efficient land use? Facilitating long-term human–animal coexistence? Similar dilemmas are evident in the questions of *when* this endpoint might be, *whose* endpoint it is and *how* to achieve it. While not claiming to provide answers to these questions, we argue that it is important to hold open 'safe' spaces in which they, and other similarly foundational issues, can be explicitly raised, interrogated, debated, reconfigured and even refused.

By extension, however, it is also important to open the spaces, structures and relations of our respective fields to change, however discomfiting this may prove. As discussed above, both conservation and the social sciences are indelibly shaped by political dynamics—from hierarchies of expertise to the pressures of funding and public accountability. Our capacity to influence real-world political processes varies significantly in practice. However, this should not deter us from exploring new and possibly counterintuitive ways of approaching such processes. Recent engagements between orangutan conservation organizations and the oil palm industry are a case in point. While not fitting easily into dominant moral narratives about orangutan extinction (Chua, 2018a, 2018b, 2018c), such moves are driven by a pragmatic acknowledgement of the political economy of conservation in Borneo and Sumatra and the need for creative approaches to entrenched situations. Yet, these efforts should not stop conservationists from also experimenting with other long- or short-term strategies, including those that might ultimately disrupt the global capitalist structures shoring up the palm oil industry (e.g. Büscher & Fletcher, in press).

Put differently, it is important to always ask when and how the very infrastructures of conservation and the social sciences, and the conditions they sustain, can be challenged or rethought. We have already discussed ways of redressing the conventional marginalization of Indigenous and other non-Western presences in conservation, and of destabilizing the linguistic and conceptual categories that legitimize problematic conservation interventions. Further steps forward for the conservation–social science relationship could include using regular exchanges to dismantle damaging stereotypes (e.g. of local people as utilitarian or ignorant, of conservationists as mere perpetrators of neo-colonial suppression), challenging the relatively common but counterproductive division between ‘pure’ and ‘applied’ research in both fields, and using ground-up evidence to influence and rework the priorities and evaluative measures of funding bodies.

## 5 | CONCLUSIONS

In this article, we have synthesized our perspectives and experiences to produce a collective reflection on key concerns and challenges in orangutan conservation today. Orangutan conservation has never been solely about orangutans, but about juggling myriad social factors and complications. To address these, it is vital that those who work in and on it do not simply fall back on existing methods and strategies. Rather, we have tried to show how engaging in sustained exchange across our respective disciplinary and sectoral boundaries can shed new light on multiple dimensions of orangutan conservation, and point to new ways of tackling its challenges.

The concerns, challenges and ideas above relate specifically to orangutan conservation, and have been articulated by a specific subset of conservationists and social scientists. However, we argue that they can be applied more generally to the evolving relationship between conservation and the social sciences. In this respect, we have also tried to fill an empirical gap in recent proposals to integrate the social sciences into conservation by thinking through

the particular issues facing one global conservation nexus, from our particular subject-positions. We add, however, that for such efforts to work, conservationists need to look beyond strategies of incorporation and integration, and consider how to engage with social science and social scientists in equal, non-co-optative ways. At the same time, social scientists, especially those working outside conservation, could make more effort to move beyond the dominant ‘anticonservation orthodoxy’ (Redford, 2018, p. 228) that positions their work in a mainly adversarial relationship to conservation. Finally, as we suggested in Part 3, it is vital that these efforts are continually informed and (re)calibrated by a critical reflexive sensibility, akin to that which characterized some earlier conservation–social science conversations (e.g. Brosius, 2006; Büscher & Wolmer, 2007; West & Brockington, 2006). Such a move demands that we attend not only to the utility of different methods and epistemological frameworks but also to their politics, limits and transformative potential.

These efforts will inevitably involve a combination of ‘muddling along’ (Sayer, Bull, & Elliot, 2008; Wollenberg et al., 2004) to enact pragmatic, incremental change, structural modification and transformation, and more ambitious big visions and programmes for overhaul (e.g. Büscher & Fletcher, in press). As we found in our workshop, these may not necessarily result in consensus, agreement or even commensuration. However, in a moment when the fates of humans and orangutans alike are being transformed in rapid and far-reaching ways, it is more important than ever that we try. Paradoxically, perhaps, this may well mean deliberately and consciously slowing down in the face of environmental crisis (real and invoked) to think more reflexively and creatively about how else—and how better—we can do the work we do.

## ACKNOWLEDGEMENTS

We are grateful to our three reviewers and the editors for their incredibly thorough, generous and constructive engagement with our paper. The workshop in which this paper originated was funded by a European Research Council Starting Grant (no. 758494) and Brunel University London. We are grateful to our fellow workshop participants, whose generosity and thoughtfulness were instrumental in shaping this paper: Bill Adams, Juanisa Andiani (who also edited our Indonesian abstract), David Chivers, Michelle Desilets, Deanna Donovan, Cristina Eghenter, Panut Hadisiswoyo, Ricko Jaya, Helen Schneider and Jonny Turnbull. Thanks too to Candie Furber, Geoff Moggridge and King’s and Churchill Colleges (Cambridge) for making the workshop possible.

## CONFLICT OF INTEREST

The authors declare no conflicts of interest.

## AUTHORS' CONTRIBUTIONS

L.C. conceived and led the writing of the manuscript; M.E.H., H.F., A.P., S.M., J.R., P.T. and S.W. drafted sections of and critically commented on the manuscript; B.B., S.M.C., R.K.P., V.S. and A.S. added critical comments; E.M. drafted sections of, critically commented on and shaped the manuscript and its arguments.

## DATA AVAILABILITY STATEMENT

The discussions in this paper are based on literature reviews (see References) and personal observations and reflections by the authors in the course of their work and research.

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## ENDNOTES

<sup>1</sup> This project (led by Liana Chua) is funded by the European Research Council (Starting Grant no. 758494) and based at Brunel University London (2018–2022). See <http://globallivesoftheorangutan.org>.

<sup>2</sup> GLO's fieldwork will be largely complete by the end of 2020. Because it is ongoing, and to protect our respondents' anonymity and security, we have not included specific data in this paper.

<sup>3</sup> Owing to budgetary constraints and our keenness to foster candid, open-ended, interpersonal discussions, we kept the workshop small rather than also flying or Skyping in orangutan scientists and practitioners from Southeast Asia. It was attended by about 25 UK- and Europe-based participants, as well as a number of Indonesian conservation practitioners who were in the UK at the time. Following the workshop, all participants were invited to collaborate on a joint article. While only those who volunteered are co-authors of the present piece, we thank the other workshop participants for shaping our initial thoughts and discussions. Our piece has also been (indirectly) shaped by many of our long-term collaborations and conversations with colleagues in Indonesia and Malaysia, to whom we record our gratitude.

## REFERENCES

- Abram, N. K., Meijaard, E., Wells, J. A., Ancrenaz, M., Pellier, A.-S., Runting, R. K., ... Mengersen, K. (2015). Mapping perceptions of species' threats and population trends to inform conservation efforts: The Bornean orangutan case study. *Diversity and Distributions*, 21, 487–499. <https://doi.org/10.1111/ddi.12286>
- Adams, W. M. (2007). Thinking like a human: Social science and the two cultures problem. *Oryx*, 41, 275–276.
- Adams, W. M., & Mulligan, M. (Eds.) (2003). *Decolonizing nature: Strategies for conservation in a post-colonial era*. Stirling, VA: Earthscan.
- Agrawal, A. (2002). Common resources and institutional sustainability. In E. Ostrom, T. Dietz, N. Dolsak, P. C. Stern, S. Stonich, & E. U. Weber (Eds.), *The drama of the commons* (pp. 41–85). Washington, DC: National Academy Press.
- Aini, J., & West, P. (2018). Communities matter: Decolonizing conservation management. Plenary Lecture, International Marine Conservation Congress, 24–29 June, Kuching, Malaysia.
- Ancrenaz, M., Dabek, L., & O'Neil, S. (2007). The cost of exclusion: Recognizing a role for local communities in biodiversity conservation. *PLoS Biology*, 5(11), e289. <https://doi.org/10.1371/journal.pbio.0050289>
- Ancrenaz, M., Gumal, M., Marshall, A. J., Meijaard, E., Wich, S. A., & Husson, S. (2016). *Pongo pygmaeus*. The IUCN Red List of Threatened Species 2016, e.T17975A17966347.
- Ancrenaz, M., & Lackman, I. (2014). Displacing nature: Orang-utans. In I. Convery, G. Corsane, & P. Davis (Eds.), *Borneo. Displaced heritage: Dealing with disaster and suffering* (pp. 273–282). Martlesham, UK: Boydell and Brewer.
- Ancrenaz, M., Meijaard, E., Wich, S., & Simery, J. (2016). *Palm oil paradox: Sustainable solutions to save the great apes*. (2nd ed.). Nairobi, Kenya: UNEP/GRASP.
- Ancrenaz, M., Oram, F., Ambu, L., Lackman, I., Ahmad, E., Elahan, H., & Meijaard, E. (2015). Of pongo, palms, and perceptions – A multidisciplinary assessment of orangutans in an oil palm context. *Oryx*, 49, 465–472.
- Ancrenaz, M., Sollmann, R., Meijaard, E., Hearn, A. J., Ross, J., Samejima, H., ... Goossens, B. (2014). Coming down the trees: Is terrestrial activity in orangutans natural or disturbance-driven? *Scientific Reports*, 4, 4024. <https://doi.org/10.1038/srep04024>
- Austin, K. G., Schwantes, A., Gu, Y., & Kasibhatla, P. S. (2019). What causes deforestation in Indonesia? *Environmental Research Letters*, 14, 024007. <https://doi.org/10.1088/1748-9326/aaf6db>
- Beastall, C., Shepherd, C. R., Hadiprakarsa, Y., & Martyr, D. (2016). Trade in the helmeted hornbill *Rhinoplax vigil*: The 'ivory hornbill'. *Bird Conservation International*, 26, 137–146.
- Beccari, O. (1986). *Wanderings in the great forests of Borneo*. Oxford, UK: Oxford University Press. (Reprint of the 1904 translation by Giglioli, E.H., and Guillemard, F.H.H. from the Italian 1902 original first edition).
- Bennett, N. J., & Roth, R. (2019). Realizing the transformative potential of conservation through the social sciences, arts and humanities. *Biological Conservation*, 229, A6–A8. <https://doi.org/10.1016/j.biocon.2018.07.023>
- Bennett, N. J., Roth, R., Klain, S. C., Chan, K., Christie, P., Clark, D. A., ... Wyborn, C. (2017). Conservation social science: Understanding and integrating human dimensions to improve conservation. *Biological Conservation*, 205, 93–108. <https://doi.org/10.1016/j.biocon.2016.10.006>
- Bennett, N. J., Roth, R., Klain, S. C., Chan, K. M., Clark, D. A., Cullman, G., ... Verissimo, D. (2017). Mainstreaming the social sciences in conservation. *Conservation Biology*, 31, 56–66. <https://doi.org/10.1111/cobi.12788>
- Berkes, F. (2012). *Sacred ecology*. New York, NY: Routledge.
- BNF (2019). *Borneo nature foundation annual report 2018*. Palangkaraya: Borneo Nature Foundation.
- Braverman, I. (2015). *Wild life: The institution of nature*. Redwood City, CA: Stanford University Press.
- Brockington, D., Scholfield, K., & Ladle, R. J. (2018). Anthropology of conservation NGOs: Learning from a sectoral approach to the study of NGOs. In P. B. Larsen & D. Brockington (Eds.), *The anthropology of conservation NGOs: Rethinking the boundaries* (pp. 47–70). Cham, Switzerland: Palgrave Macmillan.
- Bromham, L., Dinnage, R., & Hua, X. (2016). Interdisciplinary research has consistently lower funding success. *Nature*, 534, 684–687. <https://doi.org/10.1038/nature18315>
- Brosius, J. P. (1999). Analyses and interventions: Anthropological engagements with environmentalism. *Current Anthropology*, 40(3), 277–310. <https://doi.org/10.1086/200019>
- Brosius, J. P. (2006). Common ground between anthropology and conservation biology. *Conservation Biology*, 20(3), 683–685. <https://doi.org/10.1111/j.1523-1739.2006.00463.x>
- Brosius, J. P., & Hitchner, S. L. (2010). Cultural diversity and conservation. *International Social Science Journal*, 61, 141–168. <https://doi.org/10.1111/j.1468-2451.2010.01753.x>
- Brosius, J. P., Tsing A. L., & Zerner C. (Eds.). (2005). *Communities and conservation: Histories and politics of community-based natural resource management*. Walnut Creek, CA: AltaMira Press.
- Büscher, B., & Fletcher, R. (2018). Under pressure: Conceptualising political ecologies of "green wars". *Conservation and Society*, 16(2), 105–113. [https://doi.org/10.4103/cs.cs\\_18\\_1](https://doi.org/10.4103/cs.cs_18_1)

- Büscher, B., & Fletcher, R. (in press). *The conservation revolution. Radical ideas for saving nature beyond the Anthropocene*. London: Verso.
- Büscher, B., & Wolmer, W. (2007). The politics of engagement between biodiversity conservation and the social sciences. *Conservation and Society Special Section*, 5(1), 1–22.
- Campbell-Smith, G., Campbell-Smith, M., Singleton, I., & Linkie, M. (2011). Apes in space: Saving an imperilled orangutan population in Sumatra. *PLoS ONE*, 6, e17210. <https://doi.org/10.1371/journal.pone.0017210>
- Campbell-Smith, G., Sembiring, R., & Linkie, M. (2012). Evaluating the effectiveness of human-orangutan conflict mitigation strategies in Sumatra. *Journal of Applied Ecology*, 49, 367–375. <https://doi.org/10.1111/j.1365-2664.2012.02109.x>
- Campbell-Smith, G., Simanjorang, H. V. P., Leader-Williams, N., & Linkie, M. (2010). Local attitudes and perceptions toward crop-raiding by Orangutans (*Pongo abelii*) and other nonhuman primates in Northern Sumatra, Indonesia. *American Journal of Primatology*, 72, 866–876.
- Castree, N., Adams, W. M., Barry, J., Brockington, D., Büscher, B., Corbera, E., ... Wynne, B. (2014). Changing the intellectual climate. *Nature Climate Change*, 4(9), 763. <https://doi.org/10.1038/nclimate2339>
- Chan, K. M., Pringle, R. M., Ranganathan, J., Boggs, C. L., Chan, Y. L., Erlich, P. R., ... Macmynowski, D. P. (2007). When agendas collide: Human welfare and biological conservation. *Conservation Biology*, 21, 59–68.
- Chao, S. (2018). In the shadow of the palm: Dispersed ontologies among marind, West Papua. *Cultural Anthropology*, 33(4), 621–649. <https://doi.org/10.14506/ca33.4.08>
- Chua, L. (2009). To know or not to know? Practices of knowledge and ignorance among Bidayus in an “impurely” Christian world. *Journal of the Royal Anthropological Institute*, 15(2), 332–348. <https://doi.org/10.1111/j.1467-9655.2009.01556.x>
- Chua, L. (2018a). Too cute to cuddle? “Witnessing publics” and interspecies relations on the social media-scape of orangutan conservation. *Anthropological Quarterly*, 91, 873–903. <https://doi.org/10.1353/anq.2018.0043>
- Chua, L. (2018b). Small acts and personal politics: On helping to save the orangutan via social media. *Anthropology Today*, 34(3), 7–11.
- Chua, L. (2018c). Iceland advert: Conservation is intensely political, let's not pretend otherwise. *The Conversation*, November 14, 2018. Retrieved from <https://theconversation.com/iceland-advert-conservation-is-intensely-political-lets-not-pretend-otherwise-106868>.
- Correia, R. A., Jepson, P. R., Malhado, A. C. M., & Ladle, R. J. (2016). Familiarity breeds content: Assessing bird species popularity with culturomics. *PeerJ*, 4, e1728. <https://doi.org/10.7717/peerj.1728>
- Crandall, S. G., Ohayon, J. L., de Luz, A., Wit, J. E. H., Melanson, K. L., Moritsch, M. M., ... Parker, I. M. (2018). Best practices: Social research methods to inform biological conservation. *Australasian Journal of Environmental Management*, 25(1), 6–23. <https://doi.org/10.1080/14486563.2017.1420499>
- Cribb, R., Gilbert, H., & Tiffin, H. (2014). *Wild man from Borneo: A cultural history of the Orangutan*. Honolulu: University of Hawai'i Press.
- Davis, J. T., Mengersen, K., Abram, N., Ancrenaz, M., Wells, J., & Meijaard, E. (2013). It's not just conflict that motivates killing of orangutans. *PLoS ONE*, 8, e75373. <https://doi.org/10.1371/journal.pone.0075373>
- Diamond, J. M. (1992). *The third Chimpanzee*. New York, NY: Harper Collins Publishers.
- Dobson, J. (1953). John Hunter and the early knowledge of Anthropoid apes. *Proceedings of the Zoological Society of London*, 123, 1–16.
- Dove, M. (2011). *The banana tree at the gate: A history of marginal peoples and global markets in Borneo*. New Haven, CT: Yale University Press.
- Duffy, R., St John, F., Büscher, B., & Brockington, D. (2015). The militarization of anti-poaching: Undermining long term goals? *Environmental Conservation*, 42(4), 345–348.
- Eghenter, C. (2000). What is tana ulen good for? Considerations on indigenous forest management, conservation, and research in the interior of Indonesian Borneo. *Human Ecology*, 28(3), 331–357.
- Eilenberg, M. (2012). *At the edges of states: Dynamics of state formation in the Indonesian borderlands*. Leiden and Boston: Brill. [https://doi.org/10.26530/OAPEN\\_411390](https://doi.org/10.26530/OAPEN_411390)
- Ellen, R., & Harris, H. (2000). Introduction. In R. Ellen, P. Parkes, & A. Bicker (Eds.), *Indigenous environmental knowledge and its transformations* (pp. 1–31). Amsterdam: Harwood Academic Publishers.
- Escobar, A. (1998). Whose knowledge, whose nature? Biodiversity, conservation, and the political ecology of social movements. *Journal of Political Ecology*, 5(1), 53–82. <https://doi.org/10.2458/v5i1.21397>
- Fair, H. (2019). Orangutans in the Anthropocene: vulnerability, compassion and digital mediation. Paper presented to The American Association of Geographers Annual Meeting, Washington DC, April 4, 2019.
- Fairhead, J., & Leach, M. (1996). *Misreading the African landscape: Society and ecology in a forest-Savanna mosaic*. Cambridge and New York, NY: Cambridge University Press.
- Fisher, B., Balmford, A., Green, R., & Trevelyan, R. (2009). Conservation science training: The need for an extra dimension. *Oryx*, 43, 361–363. <https://doi.org/10.1017/S0030605309990263>
- Fox, J., Suryanata, K., Hershock, P., & Pramono, A. H. (2005). Mapping power: Ironie effects of spatial information technology. In J. Fox, K. Suryanata, & P. Hershock (Eds.), *Mapping communities: Ethics, values, practice* (pp. 1–10). Honolulu: East-West Center.
- Frost, N., & Wrangham, R. (2003). The environment at the periphery: Conflicting discourses on the forest in Tanimbar, Eastern Indonesia. In D. G. Anderson & E. K. Berglund (Eds.), *Ethnographies of conservation: Environmentalism and the distribution of privilege*. New York, NY: Berghahn Books.
- Gamborg, C., Parsons, R., Puri, R. K., & Sandøe, P. (2012). Ethics and research methodologies for the study of traditional forest-related knowledge. In J. Parrotta & R. Trosper (Eds.), *Traditional forest-related knowledge*. World forests (Vol. 12). Dordrecht, The Netherlands: Springer. [https://doi.org/10.1007/978-94-007-2144-9\\_14](https://doi.org/10.1007/978-94-007-2144-9_14)
- Game, E., Meijaard, E., Sheil, D., & McDonald-Madden, E. (2014). Conservation in a wicked complex world; challenges and solutions. *Conservation Letters*, 7, 271–277. <https://doi.org/10.1111/conl.12050>
- Gardner, T. (2010). *Monitoring forest biodiversity: Improving conservation through ecologically-responsible management*. London: Earthscan.
- Gaveau, D. L. A., Locatelli, B., Salim, M. A., Yaen, H., Pacheco, P., & Sheil, D. (2019). Rise and fall of forest loss and industrial plantations in Borneo (2000–2017). *Conservation Letters*, 12, e12622.
- Gönner, C. (2002). *A forest tribe of Borneo: Resource use among the Dayak Benuaq*. New Delhi: D.K. Printworld.
- Harrison, M. E., Ottay, J. B., D'Arcy, L. J., Cheyne, S. M., Anggodo Belcher, C., Cole, L., ... Frank van Veen, F. J. (2019). Tropical forest and peatland conservation in Indonesia: Challenges and directions. *People and Nature*. <https://doi.org/10.1002/pan3.10060>
- Hickman, A. (2018). Iceland's Rang-tan campaign delivers 65 m views, sales and consideration lift. *PR Week*, December 3, 2018. Retrieved from <https://www.prweek.com/article/1520088/icelands-rang-tan-campaign-delivers-65m-views-sales-consideration-lift>
- Hirsch, P. D., Adams, W. M., Brosius, J. P., Zia, A., Bariola, N., & Dammert, J. L. (2011). Acknowledging conservation trade-offs and embracing complexity. *Conservation Biology*, 25, 259–264. <https://doi.org/10.1111/j.1523-1739.2010.01608.x>
- Howes, P. H. H. (1952). *Shūn Nyamba Nang (A Collection of Land Dayak Stories)*. London: Macmillan.
- Hübschle, A. M. (2017). The social economy of rhino poaching: Of economic freedom fighters, professional hunters and marginalized local people. *Current Sociology*, 65(3), 427–447. <https://doi.org/10.1177/0011392116673210>
- Ibrahim, Z. (2015). From Island to nation-state formations and developmentalism: Penan story-telling as narratives of ‘territorialising space’ and reclaiming stewardship. Institute of Asian Studies, Universiti Brunei Darussalam Working Paper No. 15.

- Jewitt, S. L., Nasir, D., Page, S. E., Rieley, J. O., & Khanal, K. (2014). Indonesia's contested domains. Deforestation, rehabilitation and conservation-with-development in Central Kalimantan's tropical peatlands. *International Forestry Review*, 16(4), 405–420. <https://doi.org/10.1505/146554814813484086>
- Kay, C. E. (1994). Aboriginal overkill: The role of Native Americans in structuring western ecosystems. *Human Nature*, 5(4), 359–398.
- Kiik, L. (2018a). Wild-ing the ethnography of conservation: Writing nature's value and agency in. *Anthropological Forum*, 28(3), 217–235. <https://doi.org/10.1080/00664677.2018.1476222>
- Kiik, L. (2018b). Conservationland: Toward the anthropology of professionals in global nature conservation. *Critique of Anthropology*, 39(4), 391–419. <https://doi.org/10.1177/0308275X18821177>
- Knapman, G. (2008). Orang-utans, tribes, and nations: Degeneracy, primordialism, and the chain of being. *History and Anthropology*, 19(2), 143–159. <https://doi.org/10.1080/02757200802321437>
- Kovács, E., Fabók, V., Kalóczkai, Á., & Hansen, H. P. (2016). Towards understanding and resolving the conflict related to the Eastern Imperial Eagle (*Aquila heliaca*) conservation with participatory management planning. *Land Use Policy*, 54, 158–168. <https://doi.org/10.1016/j.landusepol.2016.02.011>
- Kovács, E. K., & Pataki, G. (2016). The participation of experts and knowledges in the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES). *Environmental Science & Policy*, 57, 131–139. <https://doi.org/10.1016/j.envsci.2015.12.007>
- Krech, S. (1999). *The ecological Indian: Myth and history*. New York, NY: W.W. Norton.
- Lahsen, M., Mathews, A., Dove, M. R., Orlove, B., Puri, R., Barnes, J., ... Yager, K. (2015). Strategies for changing the intellectual climate. *Nature Climate Change*, 5(5), 391. <https://doi.org/10.1038/nclimate2596>
- Larsen, P. B. (2018). The good, the ugly and the dirty Harry's of conservation: Rethinking the anthropology of conservation NGOs. In P. B. Larsen & D. Brockington (Eds.), *The anthropology of conservation NGOs: Rethinking the boundaries* (pp. 17–46). Palgrave studies in anthropology of sustainability. Cham, Switzerland: Palgrave Macmillan.
- Li, T. M. (1999). Compromising power: Development, culture, and rule in Indonesia. *Cultural Anthropology*, 14(3), 295–322. <https://doi.org/10.1525/can.1999.14.3.295>
- Li, T. M. (2007). *The will to improve: Governmentality, development, and the practice of politics*. Durham: Duke University Press.
- Louchart, F. (2014). La réintroduction des orangs-outans: récit, figure et construction de l'animalité. *Techniques & Culture*, 62(December), 128–147. <https://doi.org/10.4000/tc.8356>
- Louchart, F. (2017). *Que faire de l'orang-outan?: Reconstruire la nature à Nyaru Menteng*. Bornéo: Editions L'Harmattan.
- Lowe, C. (2006). *Wild profusion: Biodiversity conservation in an Indonesian Archipelago*. Information Series. Princeton, NJ: Princeton University Press.
- Luc Hoffman Institute (2018). *Doing science differently: Co-producing conservation outcomes*. Synthesis paper, Luc Hoffman Institute, Gland, Switzerland.
- Lumenta, D. (2011). Moving in a hierarchized landscape: Changing border regimes in Central Kalimantan. *Wacana*, 13(1), 121–145. <https://doi.org/10.17510/wjhi.v13i1.12>
- Marchal, V., & Hill, C. (2009). Primate crop-raiding: A study of local perceptions in four villages in North Sumatra, Indonesia. *Primate Conservation*, 24(1), 107–116.
- Mascia, M. B., Brosius, J. P., Dobson, T. A., Forbes, B. C., Horowitz, L., McKean, M. A., & Turner, N. J. (2003). Conservation and the social sciences. *Conservation Biology*, 17, 649–650. <https://doi.org/10.1046/j.1523-1739.2003.01738.x>
- Massé, F. (2019). Anti-poaching's politics of (in)visibility: Representing nature and conservation amidst a poaching crisis. *Geoforum*, 98, 1–14.
- McShane, T. O., Hirsch, P. D., Trung, T. C., Songorwa, A. N., Kinzig, A., Monteferrri, B., ... Welch-Devine, M. (2011). Hard choices: Making trade-offs between biodiversity conservation and human well-being. *Biological Conservation*, 144(3), 966–972.
- Meijaard, E. (2017). How a mistaken ecological narrative could be undermining orangutan conservation. In P. Kareiva, M. Marvier, & B. Silliman (Eds.), *Effective conservation science: Data not dogma* (pp. 90–97). Oxford: Oxford University.
- Meijaard, E., Albar, G., Rayadin, Y., Ancrenaz, M., & Spehar, S. (2010). Unexpected ecological resilience in Bornean Orangutans and implications for pulp and paper plantation management. *PLoS ONE*, 5, e12813. <https://doi.org/10.1371/journal.pone.0012813>
- Meijaard, E., Buchori, D., Hadiprakarsa, Y., Utami-Atmoko, S. S., Nurcahyo, A., Tjiu, A., ... Mengersen, K. (2011). Quantifying killing of orangutans and human-orangutan conflict in Kalimantan, Indonesia. *PLoS ONE*, 6, e27491. <https://doi.org/10.1371/journal.pone.0027491>
- Meijaard, E., Mengersen, K., Buchori, D., Nurcahyo, A., Ancrenaz, M., Wich, S., ... Marshall, A. J. (2011). Why don't we ask? A complementary method for assessing the status of great apes. *PLoS ONE*, 6, e18008. <https://doi.org/10.1371/journal.pone.0018008>
- Meijaard, E., Morgans, C., Msi, H., Abram, N., & Ancrenaz, M. (2017). *An impact analysis of RSPO certification on Borneo forest cover and orangutan populations*. Technical report, Borneo Futures.
- Meijaard, E., & Sheil, D. (2008). Cuddly animals don't persuade poor people to back conservation. *Nature*, 454, 159. <https://doi.org/10.1038/454159b>
- Meijaard, E., & Sheil, D. (2019). The moral minefield of ethical oil palm and sustainable development. *Frontiers in Forests and Global Change*, 2, 00022. <https://doi.org/10.3389/ffgc.2019.00022>
- Meijaard, E., Wich, S., Ancrenaz, M., & Marsall, A. (2012). Not by science alone: Why orangutan conservationists must think outside the box. *Annals of the New York Academy of Sciences*, 1249, 29–44. <https://doi.org/10.1111/j.1749-6632.2011.06288.x>
- Moon, K., & Blackman, D. (2014). A guide to understanding social science research for natural scientists: Social science for natural scientists. *Conservation Biology*, 28, 1167–1177. <https://doi.org/10.1111/cobi.12326>
- Moon, K., Blackman, D. A., Adams, V. M., Colvin, R. M., Davila, F., Evans, M. C., ... Sherren, K. (2019). Expanding the role of social science in conservation through an engagement with philosophy, methodology, and methods. *Methods in Ecology and Evolution*, 10(3), 294–302.
- Morrogh-Bernard, H., Husson, S., Page, S. E., & Rieley, J. O. (2003). Population status of the Bornean orang-utan (*Pongo pygmaeus*) in the sebangau peat swamp forest, Central Kalimantan, Indonesia. *Biological Conservation*, 110, 141–152. [https://doi.org/10.1016/S0006-3207\(02\)00186-6](https://doi.org/10.1016/S0006-3207(02)00186-6)
- Nadasdy, P. (1999). The politics of Tek: Power and the “integration” of knowledge. *Arctic Anthropology*, 36(1/2), 1–18.
- Nichols, J. D., & Williams, B. K. (2006). Monitoring for conservation. *Trends in Ecology & Evolution*, 21(12), 668–673. <https://doi.org/10.1016/j.tree.2006.08.007>
- Nowak, M. G., Rianti, P., Wich, S. A., Meijaard, E., & Fredriksson, G. (2017). *Pongo tapanuliensis*. The IUCN Red List of Threatened Species 2017, eT120588639A120588662.
- Ogden, L. A., Hall, B., & Tanita, K. (2013). Animals, plants, people, and things: A review of multispecies ethnography. *Environment and Society*, 4(1), 5–24. <https://doi.org/10.3167/ares.2013.040102>
- Ostrom, E. (1990). *Governing the commons: The evolution of institutions for collective action*. Cambridge: Cambridge University Press.
- Padoch, C., & Peluso, N. L. (Eds.) (2003). *Borneo in transition: People, forests, conservation, and development*. Kuala Lumpur, New York, NY: Oxford University Press.
- Palmer, A. (2018a). Kill, incarcerate, or liberate? Ethics and alternatives to orangutan rehabilitation. *Biological Conservation*, 227, 181–188.
- Palmer, A. (2018b). *Saving and sacrificing: Ethical questions in orangutan rehabilitation*. PhD thesis, London: University College London.
- Parreñas, J. S. (2018). *Decolonizing extinction: The work of care in orangutan rehabilitation*. Durham, NC: Duke University Press.

- Peluso, N. L. (1995). Whose woods are these? Counter-mapping forest territories in Kalimantan, Indonesia. *Antipode*, 27, 383–406. <https://doi.org/10.1111/j.1467-8330.1995.tb00286.x>
- Perez, P. L. (2010). *Deep-rooted hopes and green entanglements: Implementing indigenous peoples rights and nature-conservation in the Philippines and Indonesia*. PhD dissertation, Leiden University, Leiden.
- Peterson, R. B., Russell, D., West, P., & Peter Brosius, J. (2010). Seeing (and doing) conservation through cultural lenses. *Environmental Management*, 45(1), 5–18. <https://doi.org/10.1007/s00267-008-9135-1>
- Puri, R. K. (1999). [Penan and Kenyah hunting techniques in the Lurah River area.] Teknik-teknik perburuan pada masyarakat Penan dan Kenyah di kawasan Sungai Lurah. In C. Eghenter & B. Sellato (Eds.), *Kebudayaan dan Pelestarian Alam: Penelitian interdisipliner di pedalaman Kalimantan* (pp. 73–96). Jakarta: WWF Indonesia.
- Puri, R. K. (2005). *Deadly dances in the Bornean rainforest: Hunting knowledge of the Penan Benalui*. Leiden: KITLV Press.
- Radjawali, I., Pye, O., & Flitner, M. (2017). Recognition through reconnaissance? Using drones for counter-mapping in Indonesia. *Journal of Peasant Studies*, 44, 817–833. <https://doi.org/10.1080/03066150.2016.1264937>
- Redford, K. H. (2018). Misreading the conservation landscape. In P. B. Larsen & D. Brockington (Eds.), *The anthropology of conservation NGOs: Rethinking the boundaries* (pp. 237–241). New York, NY: Palgrave Macmillan.
- Redford, K. H., Adams, W., & Mace, G. M. (2013). Synthetic biology and conservation of nature: Wicked problems and wicked solutions. *PLoS Biology*, 11(4), e1001530. <https://doi.org/10.1371/journal.pbio.1001530>
- Rubis, J. M., & Thierault, N. (2019). Concealing protocols: Conservation, Indigenous survivance, and the dilemmas of visibility. *Social and Cultural Geography*, <https://doi.org/10.1080/14649365.2019.1574882>
- Russell, C. L. (1995). The social construction of orangutans: An ecotourist experience. *Society and Animals*, 3(2), 151–170. <https://doi.org/10.1163/156853095X00134>
- Russell, C. L., & Ankenman, M. J. (1996). Orangutans as photographic collectibles: Ecotourism and the commodification of nature. *Tourism Recreation Research*, 21(1), 71–78. <https://doi.org/10.1080/02508281.1996.11014765>
- Ruysschaert, D., & Salles, D. (2018). The strategies and effectiveness of conservation NGOs in the global voluntary standards: The case of the roundtable for sustainable palm oil. In P. B. Larsen & D. Brockington (Eds.), *The anthropology of conservation NGOs: Rethinking the boundaries* (pp. 121–150). Palgrave Studies in Anthropology of Sustainability. Cham, Switzerland: Palgrave Macmillan.
- Sandbrook, C., Adams, W. M., Büscher, B., & Vira, B. (2013). Social research and biodiversity conservation. *Conservation Biology*, 27, 1487–1490. <https://doi.org/10.1111/cobi.12141>
- Santika, T., Ancrenaz, M., Wilson, K. A., Spehar, S., Abram, N., Banes, G. L., ... Meijaard, E. (2017). First integrative trend analysis for a great ape species in Borneo. *Scientific Reports*, 7(1), 4839. <https://doi.org/10.1038/s41598-017-04435-9>
- Santika, T., Wilson, K. A., Budiharta, S., Kusworo, A., Meijaard, E., Law, E. A., ... Struebig, M. J. (2019). Heterogeneous impacts of community forestry on forest conservation and poverty alleviation: Evidence from Indonesia. *People and Nature*, 1(2), 204–219. <https://doi.org/10.1002/pan3.25>
- Sapari, I., Perwitasari-Farajallah, D., & Utami Atmoko, S. S. (2019). The Bornean orangutan (*Pongo pygmaeus wurmbii*) density in a logging concession of Hulu Belantikan, Central Kalimantan, Indonesia. *Biodiversitas Journal of Biological Diversity*, 20(3), 878–883. <https://doi.org/10.13057/biodiv/d200336>
- Sayer, J., Bull, G., & Elliot, C. (2008). Mediating forest transitions: 'Grand design' or 'Muddling through'. *Conservation and Society*, 6, 320. <https://doi.org/10.4103/0972-4923.49195>
- Scholfeld, K. (2013). *Transnational (dis)connections: Mountain Gorilla conservation in Rwanda and the DRC*. Ph.D. thesis, University of Manchester, Manchester.
- Schreer, V. (2016). *Longing for prosperity in Indonesian Borneo*. PhD dissertation, University of Kent, Canterbury, UK.
- Sheil, D., Puri, R. K., Basuki, I., van Heist, M., Saefuddin, R., Sardjono, M. A., ... Wijaya, A. (2003). *Exploring biological diversity, environment and local people's perspectives in forest landscapes: Methods for a multidisciplinary landscape assessment*. Bogor, Indonesia: Center for International Forestry Research.
- Sheil, D., Puri, R., Wan, M., Basuki, I., van Heist, M., Liswanti, N., ... Samsudin, I. (2006). Local people's priorities for biodiversity: Examples from the forests of Indonesian Borneo. *Ambio*, 15(1), 17–24.
- Sherman, J., Ancrenaz, M., & Meijaard, E. (2019). *Envisioning a future for Bornean Orangutans. Conservation impacts of 10 years of Bornean action plan implementation and recommendations for improved population outcomes*. Portland, OR: Wildlife Impact and Borneo Futures.
- Shore, C. (2008). Audit culture and illiberal governance: Universities and the politics of accountability. *Anthropological Theory*, 8(3), 278–298. <https://doi.org/10.1177/1463499608093815>
- Sidu, N., J. N. Machau, M. B. Balang, & M. Gumal (Eds.) (2015). *Orangutan folklores and Iban communities*. Kuching: Wildlife Conservation Society-Malaysia Program.
- Singleton, I., Wich, S. A., Nowak, M., Usher, G., & Utami-Atmoko, S. S. (2017). *Pongo abelii*. The IUCN Red List of Threatened Species 2017, e.T121097935A115575085.
- Sloan, S., Supriatna, J., Campbell, M. J., Alamgir, M., & Laurance, W. F. (2018). Newly discovered orangutan species requires urgent habitat protection. *Current Biology*, 28(11), R650–R651. <https://doi.org/10.1016/j.cub.2018.04.082>
- Soeharso, A. (2014). *Dari Minat Individual Ke Pranata Formal Penumbuhkembangan Pranata Pelepasliaran Orangutan Di Kalimantan Tengah/Arose from Individual Interest into a Formal Institution the Growth and the Development of Orangutan Release and Institution in Central Kalimantan*. PhD thesis, Universitas Indonesia, Depok, West Java. Retrieved from <http://lib.ui.ac.id>
- Soulé, M. E., & Wilcox, B. A. (1980). *Conservation biology: An evolutionary ecological perspective*. Sunderland, MA: Sinauer Associates.
- Sowards, S. K. (2006). Identification through Orangutans: Destabilizing the nature/culture dualism. *Ethics and the Environment*, 11(2), 45–61.
- Spehar, S. N., Sheil, D., Harrison, T., Louys, J., Ancrenaz, M., Marshall, A. J., ... Meijaard, E. (2018). Orangutans venture out of the rainforest and into the Anthropocene. *Science Advances*, 4, e1701422. <https://doi.org/10.1126/sciadv.1701422>
- St John, F. A. V., Keane, A. M., Jones, J. P. G., & Milner-Gulland, E. J. (2014). Robust study design is as important on the social as it is on the ecological side of applied ecological research. *Journal of Applied Ecology*, 51, 1479–1485.
- Sutherland, W. J., Dicks, L. V., Everard, M., & Geneletti, D. (2018). Qualitative methods for ecologists and conservation scientists. *Methods Ecology and Evolution*, 9, 7–9. <https://doi.org/10.1111/2041-210X.12956>
- The Times. (2019). Banned TV advert triggers surge in orangutan support, January 12, p. 34.
- Thornton, S. A. (2017). *(Un)tangling the net, tackling the scales and learning to fish: An interdisciplinary study in Indonesian Borneo*. PhD dissertation, University of Leicester, Leicester.
- Tsing, A. L. (2005). *Friction: An ethnography of global connection*. Princeton, NJ and Oxford: Princeton University Press.
- Utami-Atmoko, S., Traylor-Holzer, K., Rifqi, M. A., Siregar, P. G., Achmad, B., Priadhati, A., ... Campbell-Smith, G. (2017). *Orangutan population and habitat viability assessment: Final report*. Apple Valley, MN: IUCN/SSC Conservation Breeding Specialist Group.
- Vermeulen, S., & Sheil, D. (2007). Partnerships for tropical conservation. *Oryx*, 41(4), 434–440.
- Voigt, M., Wich, S. A., Ancrenaz, M., Meijaard, E., Abram, N., Banes, G. L., ... Kühl, H. S. (2018). Global demand for natural resources eliminated more than 100,000 Bornean orangutans. *Current Biology*, 28, 761–769. e765. <https://doi.org/10.1016/j.cub.2018.01.053>

- Wadley, R. L. (Ed.) (2005). *Histories of the Borneo environment: Economic, political and social dimensions of change and continuity*. Leiden: KITLV Press.
- Wadley, R. L., & Colfer, C. J. P. (2004). Sacred forest, hunting, conservation in West Kalimantan, Indonesia. *Human Ecology*, 32(3), 313–338.
- Wadley, R. L., Colfer, C. J. P., Dennis, R., & Aglionby, J. (2010). The “Social Life” of conservation: Lessons from Danau Sentarum. *Ecology and Society*, 15(4), 39.
- Wadley, R. L., Colfer, C. J. P., & Hood, I. G. (1997). Hunting primates and managing forests: The case of Iban forest farmers in Indonesian Borneo. *Human Ecology*, 25(2), 243–271.
- Wallace, A. R. (1989 [1869]). *The Malay Archipelago: The land of the orang-utan, and the bird of paradise*. Singapore, Oxford, New York, NY: Oxford University Press.
- Waters, S., Harrad, A., Bell, S., & Setchell, J. (2019). Interpreting people's behavior toward primates using qualitative data: A case study from North Morocco. *International Journal of Primatology*, 40(3), 316–330. <https://doi.org/10.1007/s10764-019-00087-w>
- West, P., & Aini, J. (2018). Critical approaches to dispossession in the Melanesian Pacific: Conservation, voice, and collaboration. Keynote Lecture, POLLEN 2018 Political Ecology Network Biennial Conference, 19–22 June, Oslo, Norway.
- West, P., & Brockington, D. (2006). Some unexpected consequences of protected areas: An anthropological perspective. *Conservation Biology*, 20(3), 609–616.
- West, P., Brockington, D., & Igoe, J. (2006). Parks and peoples: The social effects of protected areas. *Annual Review of Anthropology*, 20(3), 609–616.
- Wich, S. A., Fredriksson, G. M., Usher, G., Peters, H. H., Priatna, D., Basalamah, F., ... Kuhl, H. (2012). Hunting of Sumatran orang-utans and its importance in determining distribution and density. *Biological Conservation*, 146, 163–169. <https://doi.org/10.1016/j.biocon.2011.12.006>
- Wich, S. A., Riswan, J. J., Refisch, J., & Nellemann, C. (Eds.). (2011). *Orangutans and the economics of sustainable forest management in Sumatra*. Nairobi: United Nations Environment Programme, Great Apes Survival Partnership, Pan Eco, Yayasan Ekosistem Lestari, World Agroforestry Centre, GRID-Arendal.
- Widen, K. (2017). The rise of Dayak identities in Central Kalimantan. In V. King, Z. Ibrahim, & N. Hassan (Eds.), *Borneo studies in history, society and culture. Asia in transition* (Vol. 4). Singapore: Springer.
- Wollenberg, E., Iwan, R., Limberg, G., Moeliono, M., Rhee, S., & Sudana, M. (2004). Muddling towards cooperation: A CIFOR case study of shared learning in Malinau district, Indonesia. *Currents*, 33, 20–24. Retrieved from <https://www.cifor.org/library/1494/>
- Yuliani, E. L., Adnan, H., Achdiawan, R., Bakara, D., Heri, V., Sammy, J., & Sunderland, T. (2018). The roles of traditional knowledge systems in orang-utan Pongo spp. and forest conservation: A case study of Danau Sentarum, West Kalimantan, Indonesia. *Oryx*, 52(1), 156–165.

## SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section.

**How to cite this article:** Chua L, Harrison ME, Fair H, et al. Conservation and the social sciences: Beyond critique and co-optation. A case study from orangutan conservation. *People Nat*. 2020;00:1–19. <https://doi.org/10.1002/pan3.10072>