

Kent Academic Repository

Full text document (pdf)

Citation for published version

Chua, Liana and Harrison, Mark E. and Cheyne, Susan M. and Fair, Hannah and Milne, Sol and Palmer, Alexandra and Rubis, June and Thung, Paul and Wich, Serge A. and Buscher, Bram and Puri, Rajindra K. and Schreer, Viola and Stepien, Anna and Meijaard, Erik (2019) Conservation and the social sciences: beyond critique and co-optation. A case study from orangutan conservation.

DOI

<https://doi.org/10.1002/pan3.10072>

Link to record in KAR

<https://kar.kent.ac.uk/79491/>

Document Version

Author's Accepted Manuscript

Copyright & reuse

Content in the Kent Academic Repository is made available for research purposes. Unless otherwise stated all content is protected by copyright and in the absence of an open licence (eg Creative Commons), permissions for further reuse of content should be sought from the publisher, author or other copyright holder.

Versions of research

The version in the Kent Academic Repository may differ from the final published version.

Users are advised to check <http://kar.kent.ac.uk> for the status of the paper. **Users should always cite the published version of record.**

Enquiries

For any further enquiries regarding the licence status of this document, please contact:

researchsupport@kent.ac.uk

If you believe this document infringes copyright then please contact the KAR admin team with the take-down information provided at <http://kar.kent.ac.uk/contact.html>

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

Journal:	<i>People and Nature</i>
Manuscript ID	PAN-19-06-113.R1
Manuscript Type:	Review and Synthesis
Date Submitted by the Author:	04-Nov-2019
Complete List of Authors:	<p>Chua, Liana; Brunel University, Social and Political Sciences Harrison, Mark; Borneo Nature Foundation, ; University of Leicester, 2. School of Geography, Geology and the Environment Fair, Hannah; Brunel University, Social and Political Sciences Milne, Sol; University of Aberdeen Palmer, Alexandra; University of Oxford School of Geography and the Environment Rubis, June; University of Oxford School of Geography and the Environment Thung, Paul; Brunel University, Social and Political Sciences Wich, Serge; Liverpool John Moores University, School of Biological and Environmental Sciences Büscher, Bram; Wageningen University, Social Sciences Cheyne, Susan; Borneo Nature Foundation, ; Oxford Brookes University, IUCN SSC PSG Section on Small Apes Puri, Rajindra; University of Kent at Canterbury, School of Anthropology and Conservation Schreer, Viola; Brunel University Stępień, Anna; Brunel University, Social and Political Sciences Meijaard, Erik; Borneo Futures, ; University of Kent Durrell Institute of Conservation and Ecology; The University of Queensland, School of Earth and Environmental Sciences</p>
Keywords:	orangutan conservation, conservation-social science relationship, Borneo, Sumatra, community engagement, scientific knowledge, local knowledge, politics in/of conservation, reflexivity
Abstract:	<p>1. Interactions between conservation and the social sciences are frequently characterised by either critique (of conservation by social scientists) or co-optation (of social scientific methods and insights by conservationists).</p> <p>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.</p> <p>3. We begin with a cross-disciplinary overview of recent developments in orangutan conservation—particularly those concerned with its social,</p>

	<p>political, and other human dimensions.</p> <p>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.</p> <p>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.</p>

Conservation and the social sciences: beyond critique and co-optation

A case study from orangutan conservation

Liana Chua, Mark E. Harrison, Hannah Fair, Sol Milne, Alexandra Palmer, June Rubis, Paul Thung, Serge Wich, Bram Büscher, Susan M. Cheyne, Rajindra K. Puri, Viola Schreer, Anna Stępień, Erik Meijaard

Corresponding author:

Liana Chua

Department of Social and Political Sciences, Brunel University London, Uxbridge, UB8 3PH,
UK

Liana.Chua@brunel.ac.uk

Co-authors:

Mark E. Harrison

1. Borneo Nature Foundation, Jl. Bukit Raya No. 17, Palangka Raya 73112, Central Kalimantan, Indonesia
2. School of Geography, Geology and the Environment, University of Leicester, Leicester, UK

m.harrison@borneonature.org

Susan M. Cheyne

1. Borneo Nature Foundation, Jl. Bukit Raya No. 17, Palangka Raya 73112, Central Kalimantan, Indonesia

2. Department of Social Sciences, Oxford Brookes University, Headington Campus, Oxford
OX3 0BP, UK

s.cheyne@brookes.ac.uk

Hannah Fair

Department of Social and Political Sciences, Brunel University London, Uxbridge, UB8 3PH,
UK

hannah.fair@brunel.ac.uk

Sol Milne

School of Biological Sciences, University of Aberdeen, Cruickshank Building, St Machar Drive,
Aberdeen AB24 3UU, UK

sol.milne.2011@my.bristol.ac.uk

Alexandra Palmer

School of Geography and the Environment, University of Oxford, South Parks Rd, Oxford OX1
3QY, UK

alexandra.palmer@ouce.ox.ac.uk

June Rubis

Environmental Change Institute, School of Geography & Environment, University of Oxford
South Parks Rd, Oxford OX1 3QY, UK

jrubis@gmail.com

Paul Thung

Department of Social and Political Sciences, Brunel University London, Uxbridge, UB8 3PH,
UK

Paul.thung@brunel.ac.uk

Serge Wich

School of Biological and Environmental Sciences, Liverpool John Moores University, Byrom
Street, Liverpool L33AF, UK

S.A.Wich@ljmu.ac.uk

Bram Büscher

Department of Social Sciences, Wageningen University, De Leeuwenborch, Hollandseweg 1,
6707 KN Wageningen, Netherlands

bram.buscher@wur.nl

Rajindra K. Puri

School of Anthropology and Conservation, University of Kent, Marlowe Building, Canterbury,
Kent CT2 7NR, UK

r.k.puri@kent.ac.uk

Viola Schreer

Department of Social and Political Sciences, Brunel University London, Uxbridge, UB8 3PH,
UK

Viola.schreer@brunel.ac.uk

Anna Stepień

Department of Social and Political Sciences, Brunel University London, Uxbridge, UB8 3PH,
UK

Anna.stepien@brunel.ac.uk

Erik Meijaard

1. Borneo Futures, Block D, Unit 8, 1st Floor, Shakirin Complex, Spg 88, Kg. Kiulap BE1518,

B.S Begawan, Brunei Darussalam

2. Durrell Institute of Conservation and Ecology, Marlowe Building, University of Kent,
Canterbury, Kent CT2 7NR, UK

3. School of Earth and Environmental Sciences, University of Queensland, St Lucia 4072,
Queensland, Australia

emeijaard@gmail.com

Abstract

1. Interactions between conservation and the social sciences are frequently characterised 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.

Abstract – Bahasa Indonesia

1. Interaksi antara konservasi alam dan ilmu sosial sering dikarakteristikan dengan kritik (konservasi oleh ilmuwan sosial) atau kooptasi (metode ilmu sosial oleh praktisi konservasi).

2. Artikel ini berupaya untuk melampaui dua posisi dominan ini, dengan menggali bagaimana praktisi konservasi dan ilmuwan sosial bisa berdialog secara transformatif untuk kedua pihak. Artikel ini ditulis secara bersama oleh ilmuwan konservasi dan ilmuwan sosial, dan menggunakan perhubungan (nexus) global konservasi orangutan sebagai lensa untuk melihat tantangan dan peluang yang saat ini dihadapi oleh hubungan antara konservasi dan ilmu sosial.
3. Kami mulai dengan tinjauan lintas keilmuan mengenai perkembangan terkini dalam konservasi orangutan – khususnya yang berkaitan dengan dimensi sosial, politis, dan dimensi manusia lainnya.
4. Artikel ini kemudian melakukan analisis sintesis dari tantangan-tantangan utama dalam konservasi orangutan – bekerja menjembatani perbedaan, menggabungkan berbagai skala dan konteks, dan menangani masalah politik dan ekonomi politik– yang dihubungkan dengan keprihatinan terkait dalam hubungan antara konservasi dan ilmu sosial.
5. Pada akhirnya, kami mengidentifikasi beberapa cara bagaimana konservasi orangutan secara khusus, dan hubungan konservasi dan ilmu sosial secara umum, dapat diperbaiki: penggunaan proksi/perwakilan secara cermat sebagai alat penghubung, penciptaan ruang bersama yang baru, dan ketersediaan untuk merombak status quo. Upaya ini membutuhkan komitmen yang terbuka dan yang tidak terhindarkan dari politik untuk refleksi kritis dan transformasi diri, dari kedua belah pihak konservasi dan ilmuwan sosial.

Keywords: Orangutan conservation, conservation-social science relationship, Borneo, Sumatra, community engagement, scientific knowledge, local knowledge, politics in/of conservation, reflexivity

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 and Wolmer 2007; Chan et al. 2007; Mascia et al. 2003; McShane et al. 2011; Peterson et al. 2010; Sandbrook et al. 2013; West and Brockington 2006; West, Brockington, and Igoe 2006), there has been a recent drive to ‘mainstream’ (Bennett et al. 2017b) 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 et al. (2017a: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 et al. 2017b; Bennett and Roth 2019; Crandall et al. 2018; Moon & Blackman 2014; Moon et al. 2019; St John et al. 2014; Sutherland et al. 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 et al. 2017b; Bennett and Roth 2019; Kovács and Pataki 2016; Moon et al. 2018). 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 et al. 2017b: 63-64; Bennett and Roth 2019:A7; Kiik 2018b:4-5; Redford 2018:228-9).

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, thirdly, 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 and Wolmer 2007; Mascia et al. 2003; West and 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).¹ 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 et al. 2018; Brosius 2006; Larsen 2018; Mascia et al. 2003; Redford 2018; West and Brockington 2006). These are: the long-running, and still dominant, tendency among social scientists to *critique* conservation (Section 1.3.2; 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 and Roth 2019:A16; Moon et al. 2019:2). 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: 1) current scholarship on orangutans and orangutan conservation from across the natural and social sciences; 2) 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; 3) 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; 4) the authors’ personal observations and experiences during our own work and research (including ongoing, unpublished observations by the GLO team).² 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 et al. (2017a, 2017b) recommend integrating social scientific methods and research into conservation policy and practice, while 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 2018:231). 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 organisations, 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., Nichols and Williams 2006; Gardner 2010), 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: 1) conservation scientists, many of whom also formulate policies and strategies and lead or run conservation projects; and 2) social scientists who study conservation and its wider milieu (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.³

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 et al. 2016; Waters et al. 2018). 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.

1. 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 (1.1), we turn to two less well-studied areas: current strategies for engaging multiple human stakeholders in orangutan conservation (1.2); and social scientific studies for and on orangutan conservation (1.3). 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.

1.1 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 et al., 2016; Nowak et al. 2017; Singleton et al. 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 et al. 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 et al. 2011a; 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 et al. 2011; Meijaard et al. 2010; Sapari et al. 2019), if conflict with and killing by people can be avoided or mitigated (Campbell-Smith et al. 2012; Campbell-Smith et al. 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 et al. 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 ca. 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 and 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 et al. 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).

1.2 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.

1.2.1 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 and 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 et al. 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 et al. 2012:9). 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. 2012:9). 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 et al. 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 (MEH & SMC, pers. obs.) and that hornbills play an important part in Dayak culture, and are also commercially traded (e.g., Beastall et al. 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 and 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: 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 (LC, 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.

1.2.2. 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* (2018-19) 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, b). 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, i.e. 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 et al. 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 (SM, 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.

1.3 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).

1.3.1 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, e.g. human-wildlife conflict. One such study was a 2008-9 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 et al. 2011a). 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 et al. 2011a). Concluding that killing was a major threat to orangutans in Kalimantan (Meijaard et al. 2011a: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 et al. 1997; Wadley & Colfer 2004; 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 et al. 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.

1.3.2 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 (2018:155).

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' (2010:150; see also Meijaard and 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 and Theriault 2019:2), 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 and West 2018; West and 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: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, b) 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 et al. (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 civilised 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: 58-59). Similarly, Russell (1995) examines how Western ecotourists typically regard orangutans as either child-like or pristine and wild, with the former narrative minimising and the latter emphasising 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, b) has explored the interplay 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 et al. 2016), and to develop tools for its critical analysis and interpretation.

Finally, complementing studies of conservation organisations’ 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: 58), and suggest means of generating trans-species compassion and concern beyond the orangutan.

2. Key concerns and challenges: a synthetic discussion

As this review suggests, orangutan conservation is a ‘wicked problem’ (Game et al. 2014; Redford et al. 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. in press; Meijaard et al. 2012:9). Such approaches have detrimental impacts on local livelihoods (e.g. Jewitt et al. 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 and Pataki 2016), 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 and 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.

2.1. 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 et al. 2011b). 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 (LC, 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 hierarchical, inflected by lingering (post-)colonial inequalities, governance, and politics (Adams and Mulligan 2003; Parreñas 2018; Rubis and 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: 1) systematically downplaying their legitimacy and viability as modes of conservation (Diamond, 1992; Kay, 1994; Krech, 1999); 2) overly romanticizing Indigenous knowledge and expecting Indigenous communities to remain unchanged over time (see Brosius, 1999; Ellen & Harris, 2000; Li, 1999); or 3) 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 marginalise 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 and 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 acknowledgment of the trade-offs demanded by orangutan conservation, the practical difficulty of realizing win-win solutions (Hirsch et al. 2011; McShane et al. 2011; Jewitt et al. 2014)—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.

2.2 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 policy-makers 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: 1) 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 2) 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 and 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, policy-makers, 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, i.e. 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.

2.3 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., in press). 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 et al. 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 et al. 2018: 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 et al. 2018). Such efforts are, moreover, shaped by increasingly politicized, and polarized, invocations of palm oil (Meijaard and Sheil 2019:2) 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 are the political economies 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 and Hitchner 2010) and activities (e.g. Palmer 2018b: Ch 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 and Fletcher 2018:108)—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 organisations 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 sensationalised or impressive-sounding theoretical conversations that continually loop back on themselves. Moreover, despite the valorisation of interdisciplinarity by research institutions, strongly interdisciplinary projects often prove difficult to fund (see, e.g. Bromham, Dinnage and 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 and 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?

3. 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.

3.1 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, i.e. 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. 2012:12). 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 et al. 2018; Meijaard and Sheil 2019:10). 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 singularising 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 et al. 2018; Chao 2018; Meijaard and Sheil 2019; Meijaard et al. 2017). And as Rubis and Theriault (2019:9-12) 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 and 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 reinscribe 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 et al. 2012; Sheil et al. 2006; Sheil et al. 2003). 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.

3.2 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 1.2.2) 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 (SM, SW 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, e.g. through counter-mapping (e.g. Peluso 1995; Radjawali et al. 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 et al. 2005:5-8). 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, 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 and Theriault 2019:4), 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 and Wolmer 2007:14). 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.

3.3 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; Meijaard and Sheil 2019; Lahsen et al. 2015). As shown above, widely-used conservation concepts, such as 'local stakeholders', 'capacity building', 'threats', 'extinction', 'degraded', and 'failures' vs. '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 et al. 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 in order 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 fieldsites (see also Kiik 2018a; Ogden et al. 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-c), 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 and 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.

Conclusion

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. In order 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 2018:228) 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 and Wolmer 2007; West and 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 et al. 2008; Wollenberg et al. 2004) in order to enact pragmatic, incremental change, structural modification and transformation, and more ambitious big visions and programmes for overhaul (e.g. Büscher and 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) in order 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.

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.

Conflict of Interest

The authors declare no conflicts of interest.

Authors' Contributions

LC conceived and led the writing of the manuscript; MH, HF, AP, SM, JR, PT, and SW drafted sections of and critically commented on the manuscript; BB, SC, RKP, VS, and AS added critical comments; EM drafted sections of, critically commented on and shaped the manuscript and its arguments.

Endnotes

¹ 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>.

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

³ 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., Pelliier, 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.
- Adams, W. M. 2007. Thinking like a human: social science and the two cultures problem. *Oryx* 41:275-276.
- Adams, W.M. and M. Mulligan, 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, and E.U. Weber (eds.), *The drama of the commons* (pp. 41-85). Washington DC: National Academy Press.

- Aini, John and Paige West. 2018. *Communities Matter: Decolonizing Conservation Management*. Plenary Lecture, International Marine Conservation Congress, 24 – 29 June, Kuching, Malaysia.
- Ancrenaz, M., Gumal, M., Marshall, A.J., Meijaard, E., Wich, S.A., and Husson, S. 2016. Pongo pygmaeus. The IUCN Red List of Threatened Species 2016, e.T17975A17966347.
- Ancrenaz, M., Dabek, L., and S. O’Neil. 2007. The cost of exclusion: recognizing a role for local communities in biodiversity conservation. *PLOS Biology*. 5(11): e289.doi:10.1371/journal.pbio.0050289.
- Ancrenaz, M., and I. Lackman. 2014. Displacing nature: orang-utans. In *Borneo. Displaced Heritage: Dealing with Disaster and Suffering*. Ian Convery, Gerard Corsane & Peter Davis eds. Martlesham, UK: Boydell and Brewer, pp. 273-282.
- Ancrenaz, M., F. Oram, L. Ambu, I. Lackman, E. Ahmad, H. Elahan, and E. Meijaard. 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. doi:10.1038/srep04024.
- Austin, K. G., A. Schwantes, Y. Gu, and P. S. Kasibhatla. 2019. What causes deforestation in Indonesia? *Environmental Research Letters* 14:024007.
- Beastall, C., C. R. Shepherd, Y. Hadiprakarsa, and D. Martyr. 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 University Press, Oxford, UK. (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., Klain, S. C., Chan, K., Christie, P., Clark, D. A., ... & Greenberg, A. (2017a). Conservation social science: Understanding and integrating human dimensions to improve conservation. *Biological Conservation*, 205, 93-108.

Bennett, Nathan J., Roth, R. , Klain, S. C., Chan, K. M., Clark, D. A., Cullman, G. , Epstein, G. , Nelson, M. P., Stedman, R. , Teel, T. L., Thomas, R. E., Wyborn, C. , Curran, D. , Greenberg, A. , Sandlos, J. and Veríssimo, D. (2017b). 'Mainstreaming the social sciences in conservation'. *Conservation Biology* 31: 56-66.

Bennett, Nathan J. and Robin Roth. 2019. 'Realizing the transformative potential of conservation through the social sciences, arts and humanities'. *Biological Conservation* 229:A6-A8,

Berkes, F. (2012). *Sacred ecology*. New York: Routledge.

BNF (2019). *Borneo Nature Foundation Annual Report 2018*. Palangkaraya: Borneo Nature Foundation.

Braverman, Irus. 2015. *Wild Life: The Institution of Nature*. Redwood City, CA: Stanford University Press.

Brockington, Dan, Katherine Scholfield, and Richard J. Ladle. 2018. 'Anthropology of Conservation NGOs: Learning from a Sectoral Approach to the Study of NGOs'. In *The Anthropology of Conservation NGOs: Rethinking the Boundaries*, edited by Peter Bille Larsen and Dan Brockington, 47–70. Cham, Switzerland: Palgrave Macmillan.

Bromham, Lindell, Russell Dinnage and Xia Hua. 2016. Interdisciplinary research has consistently lower funding success. *Nature* 534:684-87.

Brosius, J.P. 2006. 'Common Ground between Anthropology and Conservation Biology'. *Conservation Biology* 20 (3) :683-685.

- Brosius, J. P. (1999). Analyses and Interventions: Anthropological Engagements with Environmentalism. *Current Anthropology*, 40(3), 277-310.
- Brosius, J. P. and Hitchner, S. L. 2010. 'Cultural diversity and conservation'. *International Social Science Journal* 61: 141-168.
- 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. and Fletcher, R. (in press). *The Conservation Revolution. Radical ideas for Saving Nature beyond the Anthropocene*. London: Verso
- Büscher, Bram and Robert Fletcher. 2018. 'Under Pressure: conceptualising Political ecologies of "Green Wars"'. *Conservation and Society* 16 (2): 105-113.
- Büscher, Bram and William Wolmer. 2007. 'The politics of engagement between biodiversity conservation and the social sciences'. *Conservation and Society* special section 5 (1):1-22.
- Campbell-Smith, G., M. Campbell-Smith, I. Singleton, and M. Linkie. 2011. Apes in space: Saving an imperilled orangutan population in Sumatra. *PloS ONE* 6:e17210.
- Campbell-Smith, G., R. Sembiring, and M. Linkie. 2012. Evaluating the effectiveness of human-orangutan conflict mitigation strategies in Sumatra. *Journal of Applied Ecology* 49:367-375.
- Campbell-Smith, G., H. V. P. Simanjorang, N. Leader-Williams, and M. Linkie. 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., Demeritt, D., Duffy, R., Felt, U., Neves, K. and Newell, P., 2014. Changing the intellectual climate. *Nature climate change*, 4(9), p.763.

Chan, K. M., Pringle, R. M., Ranganathan, J. , Boggs, C. L., Chan, Y. L., Erlich, P. R., Haff, P. K., Heller, N. E., Al-Khafaji, K. and Macmynowski, D. P. (2007). 'When Agendas Collide: Human Welfare and Biological Conservation'. *Conservation Biology* 21: 59-68.

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.

Chua, L. 2018b. Small acts and personal politics: On helping to save the orangutan via social media. *Anthropology Today*, 34(3), pp.7-11.

Chua, L. 2018c. Iceland advert: conservation is intensely political, let's not pretend otherwise. *The Conversation* 14 November 2018. <https://theconversation.com/iceland-advert-conservation-is-intensely-political-lets-not-pretend-otherwise-106868>.

Chua, L. 2009. 'To know or not to know? Practices of knowledge and ignorance among Bidayuhs in an "impurely" Christian world'. *Journal of the Royal Anthropological Institute* 15 (2): 332-348.

Correia, R.A. et al. 2016. Familiarity breeds content: assessing bird species popularity with culturomics. *PeerJ* 4:e1728 <https://doi.org/10.7717/peerj.1728>.

Crandall, Sharifa G., Jennifer L. Ohayon, Luz A. de Wit, J.E. Hammond, Kate L. Melanson, Monica M. Moritsch, Rob Davenport, Diana Ruiz, Bradford Keitt, Nick D. Holmes, Heath G. Packard, Jeffrey Bury, Gregory S. Gilbert & Ingrid M. Parker. 2018. 'Best practices: social research methods to inform biological conservation'. *Australasian Journal of Environmental Management* 25(1):6-23.

Cribb, Robert, Helen Gilbert, and Helen Tiffin. 2014. *Wild Man from Borneo: A Cultural History of the Orangutan*. Honolulu: University of Hawai'i Press.

- Davis, J. T., K. Mengersen, N. Abram, M. Ancrenaz, J. Wells, and E. Meijaard. 2013. It's not just conflict that motivates killing of orangutans. *PLoS ONE* 8: e75373.
- Diamond, J. M. (1992). *The Third Chimpanzee*. New York: 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: Yale University Press
- R. Duffy, F. St John, B. Büscher, D. Brockington. 2015. 'The militarization of anti-poaching: undermining long term goals?' *Environ. Conserv.*, 42 (4): 345-348.
- Eghenter, Cristina. 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. doi: 10.26530/OAPEN_411390.
- Ellen, R. & Harris, H. (2000). Introduction. In: R. Ellen, P. Parkes and 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.
- Fair, Hannah. 2019. 'Orangutans in the Anthropocene: vulnerability, compassion and digital mediation'. Paper presented to The American Association of Geographers Annual Meeting, Washington DC, 4th April 2019.
- Fairhead, J. and M. Leach. 1996. *Misreading the African landscape: society and ecology in a forest-Savanna mosaic*. Cambridge and New York: Cambridge University Press.

Fisher, B., A. Balmford, R. Green, and R. Trevelyan. 2009. Conservation science training: The need for an extra dimension. *Oryx* **43**:361-363.

Fox, Jefferson, Krisnawati Suryanata, Peter Hershock, and Albertus Hadi Pramono. 2005. Mapping power: ironic effects of spatial information technology. In *Mapping Communities: Ethics, Values, Practice*, ed. Jefferson Fox, Krisnawati Suryanata, and Peter Hershock. Honolulu: East-West Center, 1-10.

Frost, N., and Wrangham, R. 2003. The environment at the periphery: Conflicting discourses on the forest in Tanimbar, Eastern Indonesia. In: Anderson DG and Berglund EK (eds) *Ethnographies of Conservation: Environmentalism and the Distribution of Privilege*. New York: 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: Parrotta J., Trosper R. (eds) *Traditional Forest-Related Knowledge*. World Forests, vol 12. Springer, Dordrecht. Doi:10.1007/978-94-007-2144-9_14.

Game, E., E. Meijaard, D. Sheil, and E. McDonald-Madden. 2014. Conservation in a wicked complex world; challenges and solutions. *Conservation Letters* **7**:271-277.

Gardner, T. (2010). *Monitoring Forest Biodiversity: Improving Conservation Through Ecologically-Responsible Management*. Earthscan, London.

Gaveau, D. L. A., et al. (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, Mark E., Juliarta Bramansa Ottay, Laura J. D'Arcy, Susan M. Cheyne, Anggodo, Claire Belcher, Lydia Cole, Alue Dohong, Yunsiska Ermiasi, Ted Feldpausch, Angela Gallego-Sala, Adib Gunawan, Andrea Höing, Simon J. Husson, Ici P. Kulu, Siti Maimunah Soebagio,

Shari Mang, Lina Mercado, Helen C. Morrogh-Bernard, Susan E. Page, Rudy Priyanto, Bernat Ripoll Capilla, Lucy Rowland, Eduarda M. Santos, Viola Schreer, I. Nyoman Sudyana, Supardi Bin Bakeri Taman, Sara A. Thornton, Caroline Upton, Serge A. Wich, F. J. Frank van Veen. Forthcoming. Tropical forest and peatland conservation in Indonesia: Challenges and directions. *People and Nature*.

Hickman, A. (2018) Iceland's Rang-tan campaign delivers 65m views, sales and consideration lift. *PR Week*, 3 December 2018. <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. and Dammert, J.L. 2011.

'Acknowledging Conservation Trade-Offs and Embracing Complexity'. *Conservation Biology* 25: 259-264.

Howes, Peter H.H. 1952. *Shŭn 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, Zawawi. 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.

Kay, C.E. (1994). Aboriginal overkill: the role of Native Americans in structuring western ecosystems. *Human Nature*, 5(4), 359-98.

Kiik, Laur. 2018a. Wild-ing the Ethnography of Conservation: Writing Nature's Value and Agency In, *Anthropological Forum*, 28:3, 217-235, DOI: [10.1080/00664677.2018.1476222](https://doi.org/10.1080/00664677.2018.1476222)

- Kiik, Laur. 2018b. 'Conservationland: Toward the Anthropology of Professionals in Global Nature Conservation'. *Critique of Anthropology*, December, 0308275X1882117. <https://doi.org/10.1177/0308275X18821177>.
- Knapman, Gareth. 2008. 'Orang-utans, Tribes, and Nations: Degeneracy, Primordialism, and the Chain of Being'. *History and Anthropology* 19(2):143–59.
- Kovács, Eszter, Veronika Fabók, Ágnes Kalóczkai, and Hans Peter Hansen. 2016. 'Towards understanding and resolving the conflict related to the Eastern Imperial Eagle (*Aquila heliaca*) conservation with participatory management planning'. *Land Use Policy* 54: 158-68.
- Kovács, Eszter Krasznai & Pataki, György. 2016. 'The participation of experts and knowledges in the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES)'. *Environmental Science & Policy* 57: 131-139. 10.1016/j.envsci.2015.12.007.
- Krech, S. (1999). *The Ecological Indian: Myth and History*. New York: W.W. Norton.
- Lahsen, M., Mathews, A., Dove, M.R., Orlove, B., Puri, R., Barnes, J., McElwee, P., Moore, F., O'reilly, J. and Yager, K., 2015. Strategies for changing the intellectual climate. *Nature Climate Change*, 5(5), p.391.
- Larsen, Peter Bille. 2018. 'The Good, the Ugly and the Dirty Harry's of Conservation: Rethinking the Anthropology of Conservation NGOs'. In *The Anthropology of Conservation NGOs: Rethinking the Boundaries*, edited by Peter Bille Larsen and Dan Brockington, 17–46. Palgrave Studies in Anthropology of Sustainability. Cham, Switzerland: Palgrave Macmillan.
- Li, T.M. 2007. *The Will to Improve: Governmentality, Development, and the Practice of Politics*. Durham: Duke University Press.
- Li, T. M. (1999). Compromising power: Development, culture, and rule in Indonesia. *Cultural anthropology*, 14(3), 295-322.
- Louchart, Frédéric. 2014. 'La réintroduction des orangs-outans : récit, figure et construction de l'animalité'. *Techniques & culture*, no. 62 (December): 128–47. <https://doi.org/10.4000/tc.8356>.

- Louchart, Frédéric. 2017. *Que faire de l'orang-outan ? : Reconstruire la nature à Nyaru Menteng, Bornéo*. Editions L'Harmattan.
- Lowe, Celia. 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. Gland, Switzerland: Luc Hoffman Institute.
- Lumenta, Dave. 2011. 'Moving in a hierarchized landscape: Changing border regimes in Central Kalimantan'. *Wacana* 13 (1): 121—145.
- 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. and Turner, N. J. 2003. 'Conservation and the Social Sciences'. *Conservation Biology* 17: 649-650.
- 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., Monteferri, 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, and B. Silliman, eds. *Effective Conservation Science: Data Not Dogma*. Oxford: Oxford University, 90-97.
- Meijaard, E., N. K. Abram, J. A. Wells, A.-S. Pellier, M. Ancrenaz, D. L. A. Gaveau, R. K. Runting, and K. Mengersen. 2013. People's perceptions on the importance of forests on Borneo. *PLoS ONE* 8:e73008.

- Meijaard, E., G. Albar, Y. Rayadin, Nardiyono, M. Ancrenaz, and S. Spehar. 2010. Unexpected ecological resilience in Bornean Orangutans and implications for pulp and paper plantation management. *PLoS ONE* 5:e12813.
- Meijaard, E., S. Wich, M. Ancrenaz, and A. Marsall. 2012. Not by science alone: why orangutan conservationists must think outside the box. *Annals of the New York Academy of Sciences*, 1249: 29-44. doi:[10.1111/j.1749-6632.2011.06288.x](https://doi.org/10.1111/j.1749-6632.2011.06288.x).
- Meijaard, E., D. Buchori, Y. Hadiprakoso, S. S. Utami-Atmoko, A. Tjiu, D. Prasetyo, Nardiyono, L. Christie, M. Ancrenaz, F. Abadi, I. N. G. Antoni, D. Armayadi, A. Dinato, Ella, P. Gumelar, T. P. Indrawan, Kussaritano, C. Munajat, A. Nurcahyo, C. W. P. Priyono, Y. Purwanto, D. P. Sari, M. S. W. Putra, A. Rahmat, H. Ramadani, J. Sammy, D. Siswanto, M. Syamsuri, J. Wells, H. Wu, and K. Mengersen. 2011a. Quantifying killing of orangutans and human-orangutan conflict in Kalimantan, Indonesia. *PLoS ONE* 6:e27491.
- Meijaard, E., Garcia-Ulloa, J., Sheil, D., Wich, S.A., Carlson, K.M., Juffe-Bignoli, D., and Brooks, T.M., eds. 2018. *Oil palm and biodiversity. A situation analysis by the IUCN Oil Palm Task Force*. IUCN Oil Palm Task Force. Gland, Switzerland: IUCN.
- Meijaard, E., K. Mengersen, D. Buchori, A. Nurcahyo, M. Ancrenaz, S. Wich, S. S. U. Atmoko, A. Tjiu, D. Prasetyo, Nardiyono, Y. Hadiprakarsa, L. Christy, J. Wells, G. Albar, and A. J. Marshall. 2011b. Why don't we ask? A complementary method for assessing the status of great apes. *PLoS ONE* 6:e18008.
- Meijaard, Erik & Morgans, Courtney & Msi, Husnayaen & Abram, Nicola & Ancrenaz, Marc. 2017. *An impact analysis of RSPO certification on Borneo forest cover and orangutan populations*. Technical report, Borneo Futures.

- Meijaard, E., and D. Sheil. 2019. The Moral Minefield of Ethical Oil Palm and Sustainable Development. *Frontiers in Forests and Global Change* Volume 2, Article 22. doi: 10.3389/ffgc.2019.00022
- . 2008. Cuddly animals don't persuade poor people to back conservation. *Nature* 454:159.
- 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.
- 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. C., S. J. Husson, F. A. Harsanto, and D. J. Chivers. 2014. Fine-scale habitat use by orang-utans in a disturbed peat-swamp forest, Central Kalimantan, and implications for conservation management. *Folia Primatologia* 85:135-153.
- Nadasdy, P. (1999). The Politics of Tek: Power and the “Integration” of Knowledge. *Arctic Anthropology*, 36(1/2):1–18.
- Nichols, J. D. and B. K. Williams (2006). "Monitoring for conservation." *Trends in Ecology & Evolution* 21(12): 668-673.
- Nowak, M.G., Rianti, P., Wich, S.A., Meijaard, E., and Fredriksson, G. (2017). *Pongo tapanuliensis*. The IUCN Red List of Threatened Species 2017, e.T120588639A120588662.
- 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.
- 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: 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, Juno Salazar. 2018. *Decolonizing Extinction: The Work of Care in Orangutan Rehabilitation*. Durham: Duke University Press.
- Peluso N.L. (1995) Whose woods are these? Counter-mapping forest territories in Kalimantan, Indonesia. *Antipode* 27, 383-406.
- 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: Leiden University.
- Peterson, Richard B., Diane Russell, Paige West and J. Peter Brosius. 2010. 'Seeing (and Doing) Conservation Through Cultural Lenses'. In *Environmental Management* 45(1):5-18.
- Puri, R.K. 2005. *Deadly Dances in the Bornean Rainforest: Hunting Knowledge of the Penan Benalui*. Leiden: KITLV Press.
- 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. Pp. 73-96, in *Kebudayaan dan Pelestarian Alam: Penelitian interdisipliner di pedalaman Kalimantan*, eds., C. Eghenter and B. Sellato. Jakarta: WWF Indonesia.
- Radjawali I., Pye O., Flitner M. (2017) Recognition through reconnaissance? Using drones for counter-mapping in Indonesia. *Journal of Peasant Studies* 44, 817-833.
- Redford, Kent H. 2018. 'Misreading the conservation landscape'. In *The Anthropology of Conservation NGOs: Rethinking the Boundaries*, ed. Peter B. Larsen and Dan Brockington. New York: Palgrave Macmillan, pp. 237-241.

- Redford KH, Adams W, Mace GM (2013) Synthetic Biology and Conservation of Nature: Wicked Problems and Wicked Solutions. *PLoS Biol* 11(4): e1001530.
- Rubis, J.M. and Thierault, N. 2019. Concealing protocols: conservation, Indigenous survivance, and the dilemmas of visibility. *Social and Cultural Geography*. DOI: [10.1080/14649365.2019.1574882](https://doi.org/10.1080/14649365.2019.1574882)
- Russell, Constance L. 1995. 'The Social Construction of Orangutans: An Ecotourist Experience'. *Society and Animals* 3(2):151–70.
- Russell, Constance L., and M. J. Ankenman. 1996. 'Orangutans as Photographic Collectibles: Ecotourism and The Commodification of Nature'. *Tourism Recreation Research* 21(1):71–78.
- Ruyschaert, Denis, and Denis Salles. 2018. 'The Strategies and Effectiveness of Conservation NGOs in the Global Voluntary Standards: The Case of the Roundtable for Sustainable Palm Oil'. In *The Anthropology of Conservation NGOs: Rethinking the Boundaries*, edited by Peter Bille Larsen and Daniel Brockington, 121–50. Palgrave Studies in Anthropology of Sustainability. Cham, Switzerland: Palgrave Macmillan.
- Sapari, Iman, Dyah Perwitasari-Farajallah, and Sri Suci Utami Atmoko. 2019. "The Bornean Orangutan (*Pongo Pygmaeus Wurmii*) Density in a Logging Concession of Hulu Belantikan, Central Kalimantan, Indonesia." *Biodiversitas: Journal of Biological Diversity* 20 (3): 878–83. <https://doi.org/10.13057/biodiv/d200336>.
- Santika, T., Ancrenaz, M., Wilson, K. A., Spehar, S., Abram, N., Banes, G. L., ... & Erman, A. (2017). First integrative trend analysis for a great ape species in Borneo. *Scientific reports*, 7(1), 4839.
- Santika, Truly, Wilson, Kerrie A., Budiharta, Sugeng, Kusworo, Ahmad, Meijaard, Erik, Law, Elizabeth A., Friedman, Rachel, Hutabarat, Joseph A., Indrawan, Tito P., St. John, Freya A. V. and Struebig, Matthew J. (2019) Heterogeneous impacts of community forestry on forest

conservation and poverty alleviation: evidence from Indonesia. *People and Nature*, 1 2: 204-219. doi:10.1002/pan3.25.

Sandbrook, C., Adams, W. M., Büscher,, B. and Vira, B. 2013. Social Research and Biodiversity Conservation. *Conservation Biology* 27:1487-1490.

Sayer, J., G. Bull, and C. Elliot. 2008. Mediating forest transitions: 'Grand design' or 'Muddling through'. *Conservation and Society* 6:320.

Scholfield, Katherine. 2013. 'Transnational (Dis)Connections: Mountain Gorilla Conservation in Rwanda and the DRC'. Ph.D. thesis, Manchester: University of Manchester.

Schreer, V. 2016. *Longing for Prosperity in Indonesian Borneo*. PhD dissertation. University of Kent, Canterbury, UK.

Sheil, D., R. Puri, M. Wan, I. Basuki, M. van Heist, N. Liswanti, Rukmiyati, I. Rachmatika & I. Samsuedin. 2006. Local people's priorities for biodiversity: examples from the forests of Indonesian Borneo. *Ambio* 15 (1):17-24.

Sheil, D. R.K. Puri and others. 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.

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. Wildlife Impact and Borneo Futures, Portland, Oregon.

Shore, C. 2008. Audit culture and illiberal governance: Universities and the politics of accountability. *Anthropological Theory* 8(3): 278-298.

Sidu, N., J.N. Machau, M.B. Balang, and M. Gumal, eds. 2015. *Orang-utan Folklores and Iban Communities*. Kuching: Wildlife Conservation Society-Malaysia Program.

- Singleton, I., Wich, S.A., Nowak, M., Usher, G., and Utami-Atmoko, S.S. (2017). *Pongo abelii*. The IUCN Red List of Threatened Species 2017, e.T121097935A115575085.
- Sloan, Sean, Jatna Supriatna, Mason J. Campbell, Mohammed Alamgir, William F. Laurance 2018. 'Newly discovered orangutan species requires urgent habitat protection'. *Current Biology* 28(11):R650-R651.
- Soeharso, Ade. 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, Depok, West Java: Universitas Indonesia. <http://lib.ui.ac.id>.
- Sowards, Stacey K. 2006. 'Identification through Orangutans: Destabilizing the Nature/Culture Dualism'. *Ethics and the Environment* 11(2):45–61.
- Spehar, S. N., D. Sheil, T. Harrison, J. Louys, M. Ancrenaz, A. J. Marshall, S. A. Wich, M. W. Bruford, and E. Meijaard. 2018. Orangutans venture out of the rainforest and into the Anthropocene. *Science Advances* 4:e1701422.
- 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.
- 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.
- The Times. 2019. Banned TV advert triggers surge in orangutan support (12th January), p.34.

- Tsing, A. L. (2005). *Friction: An ethnography of global connection*. New Jersey and Oxford: Princeton University Press.
- Utami-Atmoko, S., Traylor-Holzer, K., Rifqi, M. A., Siregar, P. G., Achmad, B., Priadjati, A., ... & Campbell-Smith, G. (2017) Orangutan Population and Habitat Viability Assessment: Final Report. IUCN/SSC Conservation Breeding Specialist Group, Apple Valley, MN.
- Vermeulen, S., & Sheil, D. (2007). Partnerships for tropical conservation. *Oryx* 41(4):434-440.
- Voigt, M., S. A. Wich, M. Ancrenaz, E. Meijaard, N. Abram, G. L. Banes, G. Campbell-Smith, L. J. d'Arcy, R. A. Delgado, A. Erman, D. Gaveau, B. Goossens, S. Heinicke, M. Houghton, S. J. Husson, A. Leiman, K. L. Sanchez, N. Makinuddin, A. J. Marshall, A. Meididit, J. Miettinen, R. Mundry, Musnanda, Nardiyono, A. Nurcahyo, K. Odom, A. Panda, D. Prasetyo, A. Priadjati, Purnomo, A. Rafiastanto, A. E. Russon, T. Santika, J. Sihite, S. Spehar, M. Struebig, E. Sulbaran-Romero, A. Tjiu, J. Wells, K. A. Wilson, and H. S. Kühl. 2018. Global Demand for Natural Resources Eliminated More Than 100,000 Bornean Orangutans. *Current Biology* 28:761-769.e765.
- 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: Oxford University Press.

- Waters, Sian, Ahmed Harrad, Sandra Bell, and Joanna Setchell. 2019. 'Interpreting People's Behavior Toward Primates Using Qualitative Data: A Case Study from North Morocco'. *International Journal of Primatology*. 10.1007/s10764-019-00087-w.
- West, Paige, and Daniel Brockington. 2006. 'Some Unexpected Consequences of Protected Areas: An Anthropological Perspective'. *Conservation Biology* 20 (3):609-616.
- West, Paige, Daniel Brockington, and James Igoe. 2006. 'Parks and Peoples: The Social Effects of Protected Areas'. *Annual Review of Anthropology* 20(3):609-616.
- West, Paige and John Aini 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.
- Wich, S. A., Riswan, Jenson, 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.
- Wich, S. A., G. M. Fredriksson, G. Usher, H. H. Peters, D. Priatna, F. Basalamah, W. Susanto, and H. Kuhl. 2012. Hunting of Sumatran orang-utans and its importance in determining distribution and density. *Biological Conservation* 146:163-169.
- Widen Kumpiady. (2017) The Rise of Dayak Identities in Central Kalimantan. In: King V., Ibrahim Z., Hassan N. (eds) *Borneo Studies in History, Society and Culture*. Asia in Transition, vol 4. Springer, Singapore
- Wollenberg, E., R. Iwan, G. Limberg, M. Moeliono, S. Rhee, and M. Sudana. 2004. Muddling towards cooperation: a CIFOR case study of shared learning in Malinau district, Indonesia. *Currents*:20-24. URL: <http://www-ibyr.adm.slu.se/Currents/curr33.pdf>.

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.

(Re)imagining the conservation-social science relationship through the lens of orangutan conservation

Liana Chua, Mark E. Harrison, Hannah Fair, Sol Milne, Alexandra Palmer, June Rubis, Paul Thung, Serge Wich, Bram Büscher, Susan M. Cheyne, Rajindra K. Puri, Viola Schreer, Anna Stępień, Erik Meijaard

Conservation and the social sciences have long had a complicated relationship. Whereas conservationists historically neglected social issues and social scientific knowledge, social scientists have routinely criticized conservation's methods, policies, and practices. This relationship has recently entered a new phase, as more conservationists seek to integrate social scientific methods, data, and perspectives into their work. A key challenge, however, is how to do so without merely co-opting the social sciences into existing conservation practice.

In this paper, we ask how the conservation-social science relationship can move beyond the impasse of co-optation (of social sciences by conservationists) vs. critique (of conservation by social scientists). Taking orangutan conservation as our main case study, we argue that both conservationists and social scientists can benefit from stepping out of their comfort zones, and engaging in equal, mutually respectful, yet constructively critical ways.

To flesh out our argument, we think through one case study: the global network of orangutan conservation, in or on which most of us work. We begin with a state-of-the-field review of current ecological and social scientific research on orangutan conservation. By combining our disparate perspectives and experiences (as conservation scientists and social scientists), we aim to shed new light on the complex challenges facing orangutan conservation today. These include dilemmas over how to deal with social, cultural, and political difference, the problem of juggling scales and contexts, and the often-unacknowledged influence of politics and political dynamics. Many of these, we argue, are equally applicable to the conservation-social science relationship in a world where 'nature' and 'culture' are impossible to disentangle. We look to the future by exploring ways forward for both

orangutan conservation and the conservation-social science relationship. These include the use of proxies (keywords or issues that can stand for and bridge different parties' concerns), the creation and maintenance of shared spaces for exchange and collaboration, and a commitment to challenging status quos.

Rather than describing a conservation-social science collaboration in the field, this paper aims to be an example of collaboration in action. Through it, we hope to encourage conservationists and social scientists to think more critically and creatively about how they can work together. Paradoxically, this may mean slowing down in the face of real and perceived crisis in order to consider how—and how better—we can do the work we do.

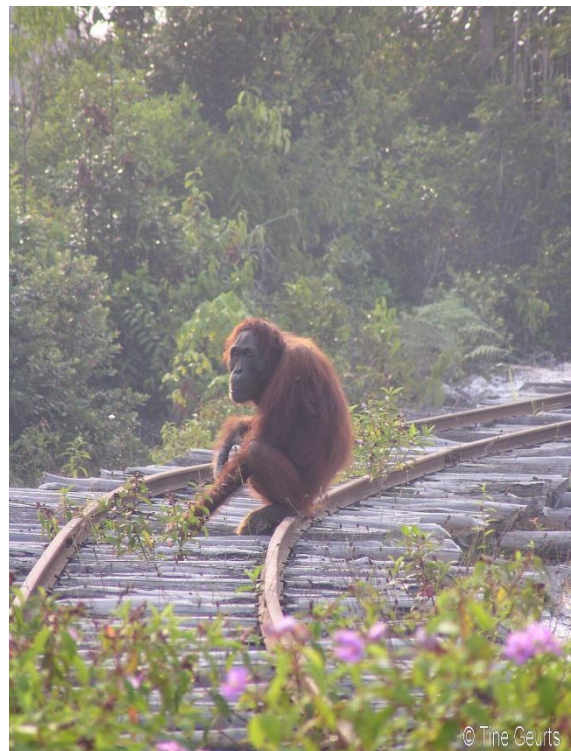


Image caption: Orangutan near a former mining concession, Central Kalimantan, Indonesia. Photo credit: Tine Geurts.