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Extinction studies in focus: Reflections on photography at a time of ecological decline

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Research Article

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Abstract

Through compositional inclusion or exclusion, the photograph can assert and communicate what belongs in a picture, in a landscape, in an ecosystem. It can illuminate what we deem conservation-worthy, or, on a larger scale, which extinctions are attention-worthy. Photographic practice helps to illuminate the active nature of extinction, and our choices as actors and witnesses within that process. Here, researchers from the University of Leeds' Extinction Studies Doctoral Training Programme present individual reflections on interdisciplinary practice-led research in the Scottish Small Isles. We consider how photography, as a form of praxis, can generate new forms of knowledge surrounding extinction: its meanings, representations, and legacies, particularly through visual representation. We offer seven perspectives on contemporary image-making, from disciplines including philosophy, conservation biology, literature, sociology, geology, cultural anthropology, and palaeontology. Researchers gathered experiential, ethical, even biological meanings from considering what to include or exclude in images: from the micro to the macro, the visible to the invisible, the aesthetic to the ecological. We draw conclusions around meaning-making through the process of photography itself, and the tensions encountered through framing and decision-making in a time of mass ecological decline.

Impact statement

The chief aim and result of this research has been to highlight the uses of photography and practice research more generally to scholars in extinction studies. Extinction studies (emerging as it does from the environmental humanities) has hitherto focused largely on the discursive and literary, whilst drawing from the biological and ecological. Here, we expand into the visual whilst drawing from a range of disciplines, from sociology to palaeontology. We show that photography is not only a valuable tool for researchers to engage with a variety of questions around extinctions both past and present but also a medium carrying risks of assumed objectivity obscuring the decision-making process behind it. By focusing on questions of inclusion and exclusion, we extend our understanding of what a photograph can and cannot do, as well as what information can be included within it and what is excluded, whether by choice or necessity. Our reflections show how image-making as a process sheds new light on topics as diverse as parasite conservation, geological time, plastic pollution, human impact, and species hierarchies.

How extinction is represented and narrated is important for our understanding of the biological, social, and cultural aspects of the current extinction event, and the subsequent responses we choose to enact. Taking a practice-led research approach, using photography as a creative medium, we extend our understanding of how the active process of extinction can be communicated through photographs, and how this is influenced by and shapes our role as actors and witnesses within that process. With a particular focus on the act of framing as an aesthetic tool, we show how the practice of photography caused us to carefully consider our own value-systems and biases in relation to extinction and the natural world, ultimately calling us into acts of deep witnessing of ongoing extinctions. We draw attention to the importance of understanding images as constructed artefacts, representative of the social, cultural, and scientific contexts within which they are produced. Considering our own photographs as constructed landscapes, we show that photographers make important choices over what belongs in the landscape, which has significant implications for our understanding of what is lost in extinction, and what in turn is a valid target for conservation. Through our reflections on photographic activity, we deepen our knowledge of what a photograph can and cannot do, outlining limitations and generating possibilities for how photographs can be used to turn the process of extinction into images that move people to respond. These findings demonstrate how practice-led research can produce knowledge within and beyond disciplinary boundaries, making it a useful tool for understanding and addressing the multifaceted problems of extinction.

Introduction

Photography and extinction have long been connected in the public image and imagination. Early 20th-century American enthusiasm for photographing Indigenous nations and individuals, for example, was closely linked to anticipated extinctions of "vanishing races" and a desire to preserve them in photographic form (while also naturalising and normalising their "vanishing") (Gidley 1998). For animals too, the photograph of an extinct species as the last trace or ghostly remnant of a "lost animal" has a power and popularity of its own, rooted in the photograph's perceived realness and immediacy (Fuller 2013; McCorristine and Adams 2019). As Joshua Schuster recently noted:

> Ever since Darwin explained how the permanent loss of species played a central role in natural history, the techniques and media used to document extinction have taken on prominent roles in the scientific and public knowledge of last animals … by the late nineteenth century, the ends of species became the subject of everyday conversations and viewable in images circulated in a variety of print media. (Schuster 2023, 43).

This desire to visually document peoples, animals and ecologies perceived to be in danger of disappearance can also be attributed to what Edwards (2009) called "entropic anxiety": an anxiety about the loss of the past as well as a concern that the future will have no record and sense of the past. Such unease about disappearing species and ecologies often permeates photographs dealing with the climate crisis.

The University of Leeds' Extinction Studies Doctoral Training Programme is defined by individual and collaborative work to "explore the rich connections between the biological, cultural, and social meanings of the global extinction crisis, and to clarify the responses and impacts that extinction is currently having upon societies and cultures across the world." (University of Leeds 2021–2023). In pursuit of these goals, in July 2023 seven researchers conducted a practice-led research trip with professional landscape photographer Colin Prior to the Scottish Small Isles (Rùm, Eigg, Muck, Canna, and nearby Coll) to consider how photography, as a form of praxis, can generate new forms of knowledge surrounding extinction: its meanings, representations, histories, and legacies, particularly through visual culture. During the trip, individuals considered how practice-led research can generate original contributions through 1) the practice itself, producing revelations about the world in the product of the image; 2) the process, learning through the act of making, more than the resulting images; and 3) the response of others based on the outcome of creative practice.

Despite researchers coming from interdisciplinary backgrounds spanning philosophy, biology, creative writing, sociology, cultural studies, geology, and palaeontology, there was a shared interest in experiential knowledge arising from the act of framing as an aesthetic tool. Collectively, we accrued learning through the *process* of photography itself – the aesthetic tensions it delivered through framing and decision-making. Practice-led research therefore gave us "specialised research insights" which have then been "generalised and written up as research" **(Dean and Smith 2009, 5). Researchers, when considering what to include, or indeed exclude, from images, gathered experiential, ethical, and even biological meanings from such choices; from the micro to the macro, from the visible to the invisible, from the aesthetic to the ecological. As theorist of photography Susan Sontag notes: "photographs alter and enlarge our notion of what is worth looking at and what we have a right to observe. They are a grammar and, even more importantly, an ethics of seeing" (2008, 3).

Here we explore the aesthetic tensions of photographic framing in relation to an understanding of extinction situated within Rob Nixon's concept of slow violence – "a violence that occurs gradually and out of sight, a violence of delayed destruction that is dispersed across time and space" (2013, 2). We understand extinction not as a single moment, but as a process of unknotting tangled webs of ecological and cultural connections (van Dooren 2014). Using photography as research practice, our work seeks to tackle one of Nixon's most pressing questions: "How can we convert into image and narrative the disasters that are slow moving and long in the making…? How can we turn the long emergencies of slow violence into stories dramatic enough to rouse public sentiment?" (2013, 3).

We use the knowledge arising out of photographic practice to discuss questions including: how the process of photography reflects and influences our wider organisation of the organic world and our reception of it as a species; what the act of including or excluding subjects through a viewfinder tells us about extinction as a binary form of absence/presence; and what photography tells us about our own species-specific or disciplinary biases. In the following subsections, each researcher contributes new generalised perspectives on extinction gleaned through specific compositional choices, building on a theory of practice-led research, and the changed understandings that photography has brought to our individual disciplines.

Photography, storytelling, and belonging in place: Jonathan David Roberts

Photography forces the researcher to confront questions of framing and exclusion, which directly relate to questions of extinction. The camera, interposed between viewer and viewed, requires the photographer to select things from their view and choose what to include and what to exclude. The photographer makes those choices along a variety of lines, but here I focus on narrative choices.

Landscape photography can be an attempt to tell a story of a place. The photograph makes claims about what the place is like and how it looks: what the "landscape" is and what belongs within it. When choosing what to include or exclude from the frame, the photographer constructs a photographic landscape. This is necessarily formed in the values of the photographer (see below: AS, KP, TB, AJB), and therefore mirrors the social creation of the physical landscape. A "beautiful" photograph of heather in Dark Peak tors, for example, embodies an aesthetic valuing of heather which reproduces a socioecological choice to maintain the peak as a heather-dominated ecosystem.

It is easy – tempting, even – to exclude inconvenient people, animals, plants or objects from this photographic landscape, something that can inadvertently imply that they do not belong in the landscape (see below: KP, KS), thereby committing symbolic violence against them. The photograph's power to assert what belongs within the landscape is thus a dangerous one.

While species driven to extinction by the physical violence of hunting and persecution, such as the Thylacine and Passenger Pigeon, are emblematic, it is more common for extinctions to be driven by the "slow violence" of habitat destruction and environmental neglect (Nixon 2013; see below: AS, KP). This violence, situated within value-laden decisions, is more closely related to the symbolic violence of a photographic landscape excluding key species (see below: AJB, TB).

At Bàgh Rubha a' Mhoil Ruaidh, therefore, I chose to keep a ruined croft in the shot (Figure 1). This building belongs in the landscape, and so did the crofters removed during the Highland

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Figure 1. Bàgh Rubha a' Mhoil Ruaidh, with ruined croft in foreground, 28 July 2023. Photograph by Jonathan Roberts.

Clearances. This tells a story that serves my wider aim of asserting that humans are unavoidably entangled with other species, who will live in the landscapes we shape long after we have left. The act of framing this photograph allowed me to express my emotional response to the extinction crisis and human alienation from nature in my present as well as to the violent historical extinction of the crofters' lifeway.

Places are created by the interactions of humans, organisms, geology, and climate; they are tangled webs of biotic and abiotic, co-created ecologies. Organisms and people are part of places, and extinction is, in part, a process of their removal from the places to which they belong. While it is therefore difficult to photograph extinction, which is signified by absence and disappearance (van Dooren 2014; Heise 2016), photographs, by actively including people, organisms, and signifiers of either, can both discover and assert what belongs in a landscape.

The loss of species from the landscape is an important aspect of extinction, and is encapsulated in the "extinction story" told of that species (Rose et al. 2017). Photographs of extinct species can be a powerful way of telling that story (McCorristine and Adams 2019; Fuller 2013), but an absence from the land is difficult to represent visually (see below: AS). Nevertheless, the accelerating disappearance of species from the land and the speed at which our landscapes are now changing require us to choose what landscapes should be and what belongs within them. This central challenge of our time links extinction problems as diverse as conservation (Krause and Robinson 2019; Kumar et al. 2018), invasive species eradication (Booyy et al. 2017; Crees and Turvey 2015), disease eradication (we do not view guinea worm-infected ponds as natural parts of the landscape (Roberts 2023; Stepan 2011)), and rewilding (Lorimer 2020). Photography, with its power to explore and assert what belongs in the landscape, is a valuable tool in facing these extinction problems.

Capturing the absent: Photography as framed and framing: Aureja Stirbyte

Even though Scotland's wildlife has experienced a 24% decline in abundance since 1990 (Scottish Government 2023), unaware visitors would not be able to tell the change when visiting the Scottish Small Isles. The Isles represent an idyllic picture of nature with abundant opportunities for beautiful photography of landscapes as well as animal life. What does it mean, then, to take photographs in such a place with the knowledge of the climate crisis and the threat of extinction? What can it tell us about ongoing species extinctions and ecological decline?

When visiting the Small Isles, I was confronted with the potential and limitations of photography for communicating knowledge about its subject (see KP). Amongst washed up trash on the beaches, it was easy to find bone fragments and even entire skeletons of birds and mammals. Such findings confronted me with my own lack of knowledge of the space I am photographing. What species do the bones belong to? Are they from the spine of a grey seal or a smaller endangered harbour seal? How did the animal die? My photographs, rendered in black and white, cannot provide answers to any such

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questions but instead generate multiple meanings: they can ask questions about natural and human-inflicted animal death, signify a looming extinction, or become an existential reflection on the cycle of life (Figure 2). Moreover, they focus on the visually noteworthy – on the textures of stones, water and bones, and their compositions. Photography is a visual medium, and as such, it seeks out aesthetic codifications of the beautiful, rather than what is considered visually boring and mundane. Extinction and ecological decline can often be invisible to an untrained eye and difficult to represent (see JDR). As someone with little knowledge of the ecology of the islands, I found that scientific knowledge of the landscape is essential when taking and reading photographs.

Becker (1995) notes that the images used in visual sociology, photojournalism, and documentary work are social constructs whose meanings arise in multiple contexts. Nature photography is no different; the way we understand a nature photograph often depends on the context. Is the image presented in a calendar? A scientific article? A tourist leaflet? Does the description provide sufficient information to explain what we are seeing? Photographs, on their own, present endless opportunities to cultivate multiple meanings, because they are "segments excised from large real-world contexts" (Barrett 1985, 62). Our cultural tendency is to perceive photographs as windows to reality, or "as mere mechanical transcriptions unencumbered by knowledge and values" (Barrett, ibid). The photographer, as the creator, is often forgotten as well as their intentions and biases which have shaped the image (see JDR).

It is especially so with nature photography, which tends to seek out the beautiful, and often intentionally hides the not-so-beautiful human impacts, such as trash. While art photography might consider the mundane as its subject, nature photography tends to focus on the awe-inspiring. Because of this, such photography is often overprocessed and oversaturated with colours that present an idyllic (or, rather, simulated) image of wild nature without any human effects (Chianese 2017). However, we can no longer look at nature photographs without taking into account ecological decline. Photography that wants to communicate the absent, such as extinction, has to rely on scientific and ecological knowledge to place the photograph in the larger framework, "whether spatial or temporal, so that we understand the role it plays in the drama of the life cycle or in the sustenance of an ecosystem" (Saito 1998, 103). Consequently, a photograph emerges as a doubly framed artefact. It is framed by a photographer at the time of inception, and continues to be framed by its social, cultural, and scientific context. Context matters more than ever when dealing with difficult and often invisible issues, such as extinction. One not only needs to possess some skill to take a "good" photograph, but also to read one – to be able to recognise the limitation of photographic framing as well as the necessity of the historic and scientific context of the image. It is a challenge to both photographer and viewer; for the former, how to capture extinction, and for the latter, how to recognise it.

Rubbish photography: Katie Prosser

The locations we visited on our trip to the Small Isles were serene and idyllic. Many of the beaches were, nevertheless, littered with plastic and other rubbish washed up from the sea or dropped by others before us. Occasionally, I positioned the camera so that the rubbish was not included, and I could get a seemingly "perfect shot" of the landscape. Other times, I photographed the landscape in full – rubbish included (Figure 3). I wanted to include the seemingly

Figure 2. Bones from the Isle of Muck, 29 July 2023. Photograph by Aureja Stirbyte.

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Figure 3. Washed up rubbish on beach, Isle of Canna, 2 August 2023. Photograph by Katie Prosser.

"un-aesthetic" parts of the landscape within my photographs as a way to highlight the issue of plastic pollution. Doing so felt like an act of *environmental photography*, defined as "the photographic documentation of industrial or man-made pollution" (Scott 2019, 262).

Estimates vary on how much plastic is in the ocean; data from 2010 suggests that between 4.8 and 12.7 million tonnes of plastic ended up in the ocean that year alone (Jambeck et al. 2015). This is a pressing issue in the context of extinction. Many marine animals suffocate, drown, or starve if they either get entangled in, or ingest, the plastic. Gall and Thomspon (2015) found that 17% of those species adversely affected by plastic pollution are threatened or near-threatened according to the IUCN Red List. The recent State of Nature Report for Scotland (Walton et al. 2023) lists marine plastics as one of the pressures species in Scotland are facing.

While environmental photography capturing the effects of plastic pollution is not new, it seemed important to document what I saw regardless. The use of photography within the extinction discourse and by extinction researchers has largely been as a way to document species that have gone extinct, or that are on the verge of extinction (for examples, see Fuller 2013). In this sense, the role of photography within extinction discourse has typically been one of "memorialisation and mourning" (Mudie 2016, 22). As a part of this, photography has been used by conservation organisations as a way of advertising their cause (Seppänen and Väliverronen 2003; see also TB below). But the use of photography can also extend beyond this.

As I stood in front of the washed-up rubbish, it seemed to me that photography can play a role in making visible the often invisible side of extinction: the causes. As noted in the introduction, extinction is a gradual process that often occurs out of sight. Insofar as we are able to identify the causes of individual, or multiple, extinctions and uncover visual representations of these, photography can be a tool to highlight the causes of extinction. These photographs can then be used to advertise the need for change, and put pressure on the organisations or structures that have led to them. In this sense, the use of photography by extinction researchers can "[go] beyond mourning…[and] turn its focus toward the world we want, or need, to become" (Mudie 2016, 27).

It is worth noting that extinction photography, when used this way, is limited. It requires that we are able to find visual representations of the causes and be able to photograph them – this is not always the case. It also lacks context. My photographs do not communicate where the plastic came from or when, and they do not communicate the scale of the problem or what effect it is having

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on the immediate environment and species. As a researcher, I was also a *visitor* to the area. I saw the washed-up rubbish as a blemish on the landscape; as representative of the issue of oceanic plastic pollution affecting many coastal areas. I did not know, however, if those – both human and non-human – who encounter these spaces on a regular basis, likewise viewed it as a problem requiring attention and action. I lacked the local knowledge that might have even pointed to a different environmental issue threatening the extinction of species on the island more than the plastic pollution I identified and photographed. Alongside marine plastics, the State of Nature Report for Scotland also lists air pollution, changes in land-use, and climate change, amongst others, as additional pressures on species. My photographs do not convey this.

They also lack context regarding the causes of plastic pollution. The photographs cannot capture the complex, interconnected environmental issues, including poor waste management, and the overconsumption, and overproduction, of single-use plastic, amongst others, that lead to plastic pollution. So, while I suggest that photography can be a useful tool for extinction researchers in highlighting the causes of extinction, we must acknowledge its limits. It thus seems important that photographs are accompanied by this additional information as a way of "anchoring meaning to the image" (Scott 2019, 262).

On Lithics and temporality: Kate Simpson

Standing on the shore of Tarbet Bay, on the Isle of Canna, on 2 August 2023, my coordinates, as ever, were not only geographic, but temporal. I was 57.05684°N, 6.55186°W, but I was also, as defined by the International Commission on Stratigraphy (n.d.), in the Holocene epoch, within the Cenozoic era, within the Phanerozoic aeon, part of the *Homo sapiens*. I was walking along and photographing basalts formed in the Palaeocene-Eocene Thermal Maximum (PETM), a major warming event that lasted upwards of 100,000 years, some 55.8 million years ago.

My colleagues were led by their own interests, particularly that of live, or recently deceased, fauna. They adjusted their shutter speeds to capture eagles in flight, seals dipping below the waves or skeletons along the shore (AJB, AS). I stayed diligently with the basalts, paying attention to a slower – seemingly motionless – lithic time. I adjusted only the zoom and aperture settings, altering histograms, and changing the light and colour of isolated geologies fractionally in my viewfinder. I stayed, as Jeffrey Jerome Cohen might describe, within an unrequited "romance of stone…since rock outlasts that which it draws close, that to which it is strangely bound" (Cohen 2015, 19).

My images stay close to their subject – cropping sea and sky from the frame, as well as footprints and other anthropogenic detritus (Figure 4). In tightly packed shots, I document an acute, and remote, relationship with the stone, and an inaccessible lithic time that both pervades and eludes the picture. Reflecting on my compositional choices, and the ways the rocks have, and will, "outlast" me, I also consider the words of art critic John Berger, who writes that "[w]e only see what we look at. To look is an act of choice. As a result of this act, what we see is brought within our reach." (2008, 8).

While shaping mine and the viewer's "reach", the photographs also highlight negative truths about a temporally specific world. I consider all the details I *chose* to omit, and all those *I could not help* but omit in a still visual medium, modelled on the human eye. In these images, I inadvertently exclude the rapid cooling of lava, and the eventual columnar jointing of its resting structure. I exclude the

Figure 4. Palaeocene basalts, Isle of Canna, 2 August 2023. Photograph by Kate Simpson.

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causes behind the PETM warming event, the volcanic eruptions and a global release of greenhouse gases. I exclude the causes, and include, only, the effect – only the ghosts of the effect. The images are still, silent, out-of-sync. They are nouns, not verbs. They do not capture, as the geologist Marcia Bjornerud notes, the asynchrony of warming events which imbalance the "normally commensurate temporal of evolution and environmental change – well matched over time, in the same way that tectonics and erosion keep pace with each other." (2020, 119).

If practice-led research can contribute to knowledge through "detectable" outputs, (Smith 2009, 5) the art of framing, and indeed the final frames themselves, reveal truths about our limited spatio-temporality. As we consider the extinctions happening in the present, and those yet to come, these images "detect" a flattened, temporal view and a destructive peripheral blindness, operating amid climactic asynchrony.

Seals, Selkies, and species Bias: Amy Jane Bartlett

I am a man upon the land;
I am a selchie on the sea,
and when I'm far frae ev'ry strand,
my dwelling is in Sule Skerry.
– The Great Selkie o' Suleskerry (Child and Bronson, 1959)

As I sat by the waters of Coll, I noticed that my fellow researchers and I were being watched: a curious seal pup was swimming along the shoreline, popping up every now and again to observe us. Over time, the seal gradually came closer to where we were perched upon the rocks. In those moments I felt wholly connected to the world around me and I wanted to capture this feeling through my camera as best I could: to reflect the gaze between the seal and myself (Figure 5). In those moments, it did not feel as though there was a difference between the human and the nonhuman gaze. Rather, it felt as though there was a mutual observation through shared seeing.

Seals have long enriched the pages of Scottish folklore. From accounts of sailors mistaking seals for mermaids, to ballads of selkies (mythical shapeshifters who undergo a "magical metamorphosis" (Heddle 2016, 1) through the shedding of their seal skin to reveal a human form), these mammals have fostered a rich cultural capital in the UK. Alongside definitions of selkies as seal-human shapeshifters, there are also parts of Scottish folklore that claim that selkies are the souls of those who have died at sea, reincarnated in seal form (Heddle, 2016). Either way, the connection between the human and more-than-human is central to the cultural blueprint of this romanticised mammal.

Perhaps it is this long-standing cultural affinity with seals that has greatly aided them in conservation efforts, as seal populations are ardently protected under UK law (Marine Management Organisation 2023). While Harbour seal populations have been on the decline in the British Isles over the past two decades – a 50% decline in numbers since 2000 (People's Trust for Endangered Species n.d.) – neither Harbour nor Grey seals are considered to be at risk of extinction, as both are categorised as "Least Concern" on the IUCN Red List. Despite this, we are more likely to see campaign photography of aesthetically "cute" animals, like seals, with calls for protective action than we are for other, more endangered local species that are less aesthetically "pleasing", like the pond mud snail or the pine hoverfly (see AS, TB).

I can see my own biases reflected in my choosing to focus on photographing (and, therefore, ascribing higher value to) the more culturally familiar species, rather than species that are in a more

Figure 5. Seal off the Isle of Coll, 30 July 2023. Photography by Amy Bartlett.

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vulnerable ecological position. This prompts questions of species hierarchy and value placement in extinction studies, as there seems to be a desire to protect that with which we find connection. For me, this raised concerns over how cultural depictions of different creatures have permeated present-day conservation efforts. As argued by Holmes et al. (2018), "magical animals" play an important role in the "protection of species and habitats in many locations" (231). Perhaps we feel a sense of fondness, and maybe even kinship, for the mammals that have inspired the beloved mythological creatures, like selkies, which are so intimately written into our collective consciousness.

Photography as a research method is a useful tool for extinction studies, as it forces the researcher to consider their subjects from a variety of perspectives, as well as a consideration of their own biases. Applying a more holistic approach to research practice allows us to broaden the scope of extinction studies research, positioning us to better comprehend the many different aspects of extinction. If we are to regard photography – and photographs themselves – as a prism, through which we are able to contemplate multiple contexts of extinction at once, it could be a useful tool in ensuring a more thorough research practice. Considering photography in this way renders it a deeply reflective research practice, allowing the photographer to look within oneself and their inner systems of value placement. My own experience has shown that photography can reveal our own conservation biases within the field of extinction studies: it can illustrate which parts of nature – which systems of living and dying – we deem most important, determining which narratives we elect to tell (see TB, JDR).

Photography and parasites – Entering the frame for conservation: Tim Brown

The seal was not the only animal to express an interest in our presence on the Small Isles. Midges found sustenance in our bloodstreams. Ticks took this intimacy even further, seeking both nutrition and shelter in our reluctant flesh. Unlike with the seal, my response to this interest was not photography but disgust, followed by hasty removal of the offenders. On another day, a golden-ringed dragonfly settled on the heather by my feet. Dazzled by the clash of black, gold, and pink, I reached straight for my camera. Of the many organisms whose path I crossed on our trip, the seal and the dragonfly were the only two I chose to record through photography. Something about these two entanglements struck me as worthy of capturing, unlike the countless other species with whom I shared the landscape.

In my research, I focus on the conservation of undesirable but ecologically important parasite species. In the field, however, I conformed to common taxonomic biases, giving my attention to species conventionally thought of as charismatic, regardless of their ecological value or conservation status. This meant mammals with large bodies and forward-facing eyes (Clucas et al. 2008; Smith et al. 2012), and brightly coloured invertebrates construed as being aesthetically pleasing (Kellert 1993; Schlegel et al. 2015).

Animal photography has great importance in biodiversity conservation, and is applied in wide-ranging practical interventions from monitoring animal populations to remote sensing of environmental change (Wich and Piel 2021). However, arguably the most important use of photography in conservation is advertising. Conservation organisations rely heavily on photographs of highly charismatic "flagship" species in marketing campaigns designed to solicit financial support from the public (Veríssimo et al. 2011). The use of flagship species in advertising takes place in a wider context of the increasing commodification of nature, in which animals and ecosystems are recast as marketable assets that should pay their own way to conservation (Luke 1997). These campaigns both appeal to and reinforce our perceptions of what species are valuable and worthy of conservation. Species that fail to attract commercial interest are thus typically excluded from popular conservation narratives. This raises the question of whether conservation biologists like myself have a responsibility to challenge these biases, and whether photography can be used to this end.

The Manx shearwater flea is a parasitic species restricted to just one colony of Manx shearwaters living on the Isle of Rùm, making it one of only six insects truly endemic to the UK (Kwak et al. 2019). Due to its rarity and endemicity, the Manx shearwater flea may be the species at greatest risk of extinction on the Small Isles. Even for unpopular animals like fleas, there is evidence to suggest that raising their profile in conservation campaigns can increase public backing (Veríssimo et al. 2017). By choosing to photograph and distribute images of parasites, we can insert them into conservation discourse, and encourage appreciation of their complex biology and ecology. Set against this, there is a risk that for widely feared and disliked parasite species, photographs could reaffirm why people are disgusted by them – their "seemingly alien morphology" can make it challenging for us to accept them as kin (Hatley 2011).

If photographs of extinct species have a unique power in asserting the material reality of these species in the mind of the viewer (Fuller 2013), then photographs of extinct parasites may confirm the existing biases of the public: that the loss of these perceived monstrosities is a positive thing (Kellert 1993). Parasites are also often microscopically small. Photographing parasites with ultra-zoom lenses fixes them "in a domain which, although entirely visible to the camera, [can] never be entered by the spectator" (Berger, 2009, 16), compounding the notion that parasites are alien to our anthropocentric world.

An alternative approach might be to focus on landscape photography as a way of highlighting the important roles parasites play in the structure and functioning of ecosystems (Hatcher and Dunn 2011). This could be achieved by situating parasites within landscape photographs by providing additional information on the parasites present in the ecosystems pictured. For example, the Manx shearwater flea is a part of the rich web of species that forms an ecosystem of great conservation importance on and around the Isle of Rùm (Figure 6). The extinction of the Manx shearwater flea could trigger a range of impacts across this food web and the landscape of Rùm; for example, parasites often exert control over host population numbers, and the loss of the shearwater flea could lead to changes in the shearwater population, with potential knock-on effects for the prey species of shearwaters.

One consideration for this approach is that landscape photography is often guided by our own aesthetic biases, which may conflict with a parasite's notion of an ideal landscape. For example, the presence of dead animals can support the transmission of parasitic diseases, but goes against human sentiments that the presence of death in a landscape is unsightly (Tucker et al. 2018, Weinstein et al. 2018). Through photography, I became aware of my own deep-lying taxonomic biases (see also AJB), leading me to reflect on the wider use of photography in conservation. New approaches, emphasising a broader range of subjects including parasites and ecosystems, could reshape conservation narratives to include unloved, but ecologically important, others. In the case of parasites, careful consideration will need to be given to the ways in which parasites are commonly perceived or misunderstood in order for photography to be used as a tool that can help prevent extinction.

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Figure 6. The Isle of Rùm from the Bay of Laig on the Isle of Eigg, 1 August 2023. Photograph by Timothy Brown.

Rendering the invisible visible – Photography as an embodied process: Sarah Oakes

> *We must not allow the clock and the calendar to blind us to the fact that each moment of life is a miracle and mystery.*
> – HG Wells.

While photography holds the possibility of distracting researchers with thoughts of framing, storytelling and ethics, the act equally allows for pause and reflection; a dropping into stillness to be fully present to a moment that will never come again. This presence enables us to see with new eyes patterns, beauty, fragility, time, and the interconnected nature of all things. We do not know what the future holds for a place or species, and yet we take time to really appreciate it, holding grief and hope in the face of it. Each moment thus becomes an extinction in progress; its uniqueness is never to be repeated. The active noticing of these ongoing extinctions permits consciousness around the impermanence of time, and the fragility of all life within it. And so photography itself becomes an act of deep witnessing.

What impact does that have on the witness, to experience a space and time with such presence, in a capitalist-induced rush culture that not only implicates us in environmentally destructive practices, but also prevents us from truly seeing or interacting with the reality in front of us? This Eurocentric sociocultural inheritance deters us from conscious decision-making, because such consciousness requires presence. At a time of extinction, conscious witnessing – through photography – thus becomes a form of resistance, rather than succumbing to the temptation to ignore what is uncomfortable to know, we stay present to it. Inherited structural and systemic violences keep us separated from kith and kin of all kinds, physically, mentally and spiritually. Yet, under the guise of "producing" useful outcomes, photography can lure a colonised mind to sit in stillness, reaffirming a connection with the environment that has been lost through disparate ways of living. It can thus act as a critical intervention to rupture unthinking business-as-usual destruction of earth, as we become more present to the fact that we are part of place and time (KS), and in relationship with all those who share it with us (AJB, TB).

Meanwhile, we cannot "unsee" what we have seen in full consciousness. It is this presence that allows the subject of extinction to sink into the body, transmuting into an embodied knowing that impacts far beyond logic and intellectual reasoning. Embodied knowing then becomes an act of cultural subversion, overcoming the separatist dualism of mind/body approaches to learning that dominate Eurocentric culture, which relies upon a knowledge hierarchy in which mind trumps body in the knowledge-creating process (Simon 1998).

While it may never be possible to transmit embodied experiences via images to observers not present in that space or moment (KS), the act of photographing *can* impact photographers' own future decisions and actions. At a time when collective conscious action is most urgent, this embodied knowing – through conscious witnessing – could provide impetus to catalyse the sociocultural changes necessary for a different future. One that perhaps does not include mass extinction.

Rendering the invisible visible, for example the photographer – as I have done in my image of Colin Prior (Figure 7) – is a way to explicitly foreground not only their subjectivity, but also the invisible processes taking place through the act of photography that permit deeper presence in a particular place and time. This foregrounding brings more consciousness to how photography itself may have impacts on the image-maker, as much as the image to which the observer is presented.

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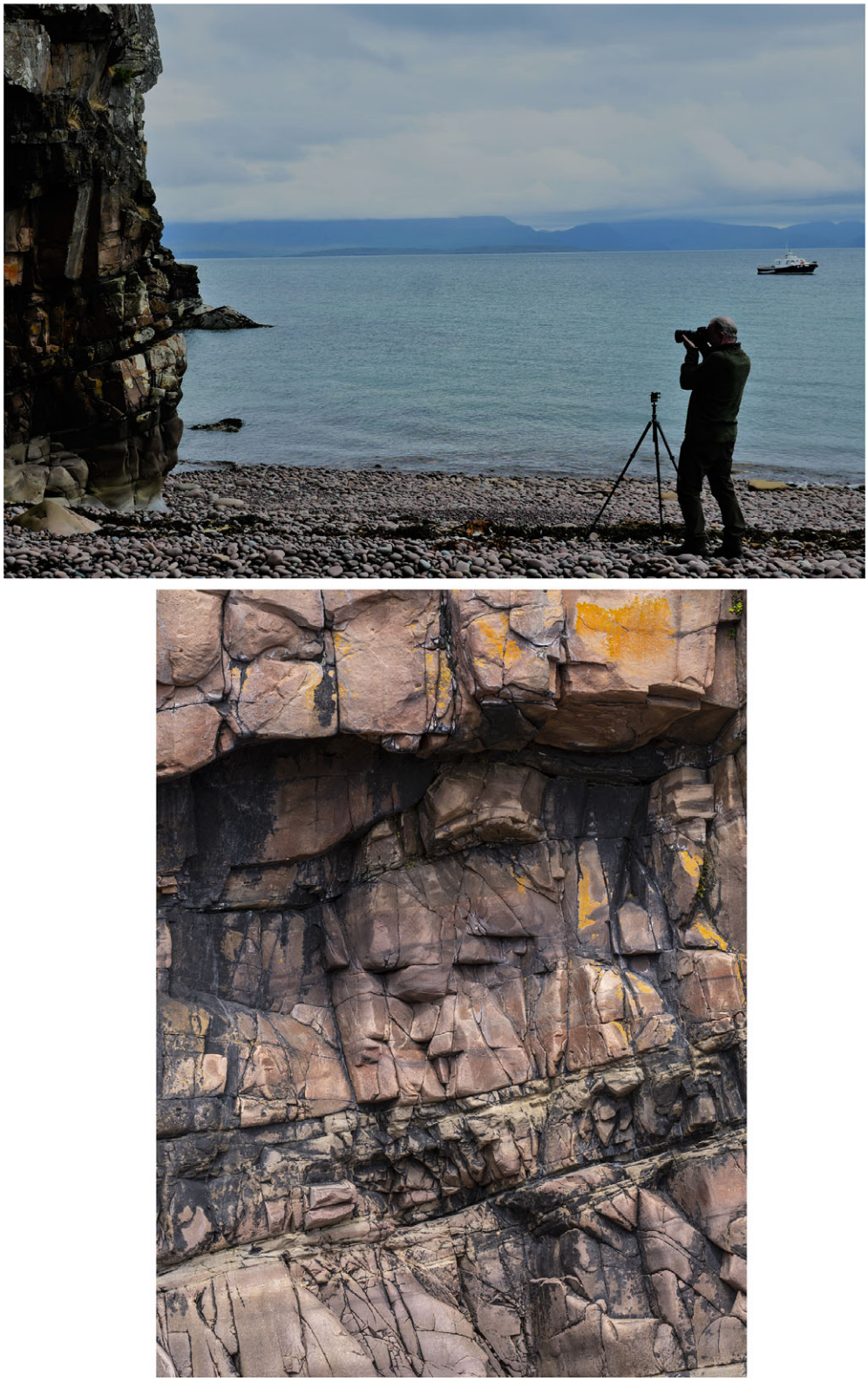

Figure 7. Scottish landscape photographer Colin Prior taking a photograph of rock formations at Bàgh Rubha a' Mhoil Ruaidh on the Isle of Rùm, 28 July 2023, alongside Prior's final image, a study in Cubism. Photographs by Sarah Oakes and Colin Prior.

Conclusion

The problem, or problems, of extinction demands interdisciplinary approaches, and photography, like other forms of practice research, offers a way of extending the knowledge of researchers based in other disciplines in embodied, tacit, affective and imaginary ways. While photography is not our primary mode of research, its incorporation into our work has proved to be a valuable academic auxiliary. Photography allowed us to reflect on extinction in different ways, which,

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though rooted in our own disciplinary perspectives, provided more personal, practice-based perspectives. While the act of photographing is a subjective practice that imbues images with ecological, temporal and social meanings, it enabled us to focus on different aspects of the relationship between photography and extinction research.

Some of us found the very act of photographing to be more significant than the resulting images, because of how it enables presence, greater consciousness of the realities we face, and better decision-making in the face of them (SO). As such, photography is often a deeply reflective research practice, allowing the researcher to look within oneself and one's value system in the context of their research (AJB). Others focused on the subjective biases present in the very photograph itself. Photographs represent a flattened temporal view, and highlight the biases that govern our sight and imagination, as well as the invisible spatial dimensions through which species continue to interact. (KS).

As constructed landscapes, photographs challenge the photographer to confront the question of what belongs in the landscape, and what is lost in extinction (JDR). As such, photographs are not windows to reality, but constructed artefacts with their own social, cultural, and scientific contexts (AS). In this regard, while images can perform important roles both in representing the effects of extinction and highlighting the causes of it, we, as researchers, should remain aware of our limitations and endeavour to provide additional context to any images we use insofar as we are able to (KP). In the case of animal extinction, photographs can have the power to both maintain and contest dominant conservation narratives, and considered use of photography could be used to draw conservation attention to a wider range of unloved but ecologically valuable species (TB).

Our photographic practice-led research in the Scottish Small Isles did not produce a unified singular conclusion or outcome but facilitated a multiplicity of approaches toward extinction studies and their relationship to photography. Photography, as a prism, reflects our personal interests and disciplinary focuses, while facilitating a deep reflection of our own biases and compositional choices. Photographic practice illuminates the active nature of extinction, and our choices as actors and witnesses within that process.

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