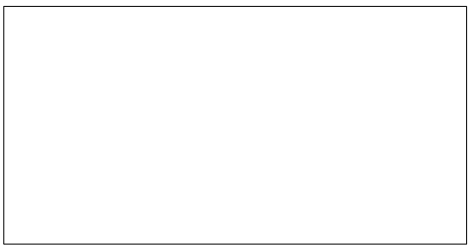

Cultural geographies of extinction: animal culture amongst Scottish ospreys

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Abstract

This paper explores cultural geographies of extinction. I trace the decline of the Scottish osprey during the nineteenth century, and its enduring, haunting presence in the landscape today. Taking inspiration from the environmental humanities, extinction is framed as an event affecting losses that exceed comprehension in terms merely of biological species numbers and survival rates. Disavowing the 'species thinking' of contemporary conservation biopolitics, the osprey's extinction story pays attention to the worth of 'animal cultures'. Drawing a hybrid conceptual framework from research in the environmental humanities, 'speculative' ethology and more-than-human geographies, I champion an experimental attention to the cultural geographies of animals in terms of historically contingent, communally shared, spatial practices and attachments. In doing so, I propose nonhuman cultural geographies as assemblages that matter, and which are fundamentally at stake in the face of extinction.

Key Words

Extinction, Conservation, Cultural geography, More-than-human geography, Osprey, Scotland

Introduction

The species label *Pandion haliaetus* – the osprey – envelopes much lively difference and possibility. Across four subspecies of this brown and white piscavore are variations in size, markings and geographical behaviour. Furthermore, past and present observations suggest multiple osprey life-ways are possible, expressed between, and within, these subspecies. Colonial behavior, for example, characterises certain communities (notably in North America) but not others, perhaps reflecting prey or nest availability (Newton, 1979). In a similar vein, European and North American ospreys (*P.h. haliaetus* and *P.h. carolinensis*) are migratory, whilst Australian (*P.h. cristatus*) and Caribbean (*P.h. ridgwayi*) birds are not. For mobile communities, annual seasonal refrains correspond with sea ice coverage; spring melts driving prey into northern shallows (Poole, 1989). For Scottish ospreys (my focus here), wintering grounds predominate on Africa's western coast. After an initial successful migration south, the young birds reside here for around three years before returning north to seek a mate and nest. Rearing young in summer, breeding adults depart come autumn (Dennis, 2008). Migration studies posit that favoured routes may be shared across generations and regional communities (see Dennis, 2008).

Regional differences, and preferences, suggest osprey lives are geographically contingent. This paper explores such contingency in the context of extinction. Paying close, geographical attention to the lives of birds, I sketch the historical cultural geographies of the osprey in Scotland, from the late-eighteenth to the early-twenty-

first century. Following calls for more 'beastly' geographies (Hodgetts and Lorimer, 2015) I take seriously the lived spatio-temporal particulars of osprey life. In conversation with recent work within the environmental humanities, I frame osprey differences in terms of an 'animal culture' both spatially and temporally contingent, and at stake amidst the unfolding geographies of extinction. Historical records of ospreys in Scotland reveal such differences, emergent over time, raising questions regarding the nature of extinction and loss.

Consider that in the early-nineteenth century the northern Scottish county of Sutherland hosted a vibrant community of ospreys. In 1848, notorious sportsman and naturalist Charles St John travelled here with professional egg-collector William Dunbar (see St John, 1884). Visiting lochs where ospreys nested on ruins and rocky outcrops – including Assynt, 'an Laig Aird' (possibly Laicheard) and an Iasgair (Figure 1) – they took eggs and shot several adult birds. Afterwards, Dunbar wrote to a southern client that they had 'finally done for the Ospreys in Sutherland' (Harvie-Brown and MacPherson, 1904: 186).

Over a century later, in August 1961, George Waterston, Scotland's representative for the Royal Society for the Protection of Birds, holidayed in northwest Sutherland. He had just overseen a third successful nesting season for the ospreys at Loch Garten, Speyside. Dubbed 'Operation Osprey', re-colonising birds had raised young in the Cairngorms under Society protections since 1959 (see Brown, 1979). Their presence marked a return from 40 years of breeding extinction in Britain. Now

stewarding the re-colonisation, it seems Waterston was curious to retrace St John's footsteps. He drew on accounts of the 1848 tour when planning his own northern vacation. Waterston subsequently recalled his palpable excitement when standing 'almost exactly' where the infamous sportsman had once observed nesting ospreys (Waterston, 1962: 113).

[Figure 1 – Map showing the location of Scottish nest sites discussed in this paper. Credit to L. Schofield]

Whether scouting sites of potential re-colonisation or seeking sober reflection in remote surrounds, the account Waterston offers of his excursion in Sutherland conjures a profound *curiosity* for the ospreys' former geography and lifeworld. This historical vignette also raises a question: how should we reckon with such an absence – less of a biological species than of a particular way of living – when that which was absent *comes back*? This paper, with a desire to craft more interesting, lively accounts of more-than-human historical geographies, argues in response for the need to appreciate extinction in terms beyond the species biopolitics of contemporary conservation. Considering questions of extinction with an eye on contemporary debates around reintroduction, re-wilding, and even 'de-extinction', geographers must attend to that which remains lost even after a species *returns*.

Composing osprey historical-cultural geographies

Emerging out of a larger project seeking to explore the historical animal geographies of Scottish osprey conservation (Garlick, 2017), this paper reads the insights of scientific ornithology and empirical accounts of osprey life through a conceptual framework rooted in contemporary literature around affect, neovitalist materialism, biophilosophy and 'speculative ethology'. Thinking in speculative, risky and creative ways about histories and cultures beyond the human foregrounds important ethical questions about what is at stake in extinction.

My argument is based upon a speculative reading of the surviving traces and stories of osprey presence, informed by the insights of a broader natural-scientific and conservation literature concerning their behaviour, ecology and breeding biology. I am alert to the contradiction here: seeking to challenge essentialist notions of species whilst relying on literature steeped in this mode of understanding life and its processes. This corpus enables me to better trace the activities and conditions characteristic of osprey lived existence, such as it haunts the 'non-innocent' eighteenth- and nineteenth-century documentary accounts of naturalists, travellers, artists and sportsmen, comprising a nebulous 'animal archive' of ospreys in Scotland (Benson, 2011).

However, I am careful not to allow such work to delimit *a priori* the capacities of ospreys, or figure them transcendent of history and geography. Drawing on scientific literature need not necessitate rigid adherence to a single scientific model,

113 or overly circumscribe the possible forms that osprey behaviour might take (Lestel *et*
114 *al,* 2014). Rather, contemporary work on osprey ecology and conservation sharpens
115 attention to how animal existence and agency are historically assembled and
116 expressed in relation to a host of other actors and material conditions (Howell,
117 *forthcoming*).
118
119 Similarly, many discussions held during the course of research with individuals who
120 have spent time working with these birds likewise inform my understanding of
121 ospreys' capabilities (see Midgely, 1988). Stories of humans living and working with
122 birds past and present provide 'narratives of affiliation' (H. Lorimer, 2009: 65),
123 helping tune into the elements of the environment affecting, and affected by, animal
124 existence (J. Lorimer *et al*, 2017: 6). In sum, extant writing and reflection on ospreys,
125 by those who have spent years researching with them, assists me in asking the 'right
126 questions' of documents bearing their trace (Despret, 2016).
127
128 As much a geographical thought experiment as act of historical-cultural geography
129 scholarship, this paper seeks to fulfil the ambitions of a more-than-human history by
130 speculating on the historical conditions for (and of) osprey existence (Despret, 2013).
131 This is also an ethical project of imagination and recognition. Perhaps, as Dominique
132 Lestel argues, we attribute 'too much' to humans, and 'too little' to others in social
133 theory (2014b: 99). A little epistemological 'courtesy' (albeit critically informed and
134 reflexive [Johnston, 2008: 644-645]) might stem from the recognition that, in certain
135 ways and under certain conditions, animals are '*not* so different from humans' (Philo

and Wilbert, 2000: 25, original emphasis). I frame osprey life as active and contingent: an outcome of situated involvements between birds, humans, and other agencies (after Woodward *et al*, 2010).

The aim is to write historical geography more attuned to ospreys' agential potential. Rather than cry 'anthropomorphism!' I urge the reader to persist and consider the questions such an account opens onto. A more lively account of past ecologies, I argue, offers one route by which to mobilise the care required to live with, and respond to, past and present environmental losses (see Tsing, 2015; Chrulew, 2011). The alternative – divesting ospreys of lived experience and specificity – merely 'mechano-morphises' (Crist, 1999) creatures that, like ourselves, demonstrably perceive the world, respond to it, and 'really are alive' (Ingold, 1994: xxi).

Over the following paper I attend to the more-than-human cultural geographies at stake in extinction. I begin by establishing a conceptual framework that challenges the 'species thinking' of conservation biopolitics and extends 'culture' beyond humans. I then sketch the dimensions of a Scottish osprey 'cultural community' and its unravelling until the point of eradication in 1916. Tracing a disjointed geography of absence and presence, I emphasise the enduring losses that extinction (as the cessation of a 'way of life') affects, demonstrating why thinking with animal culture alerts us to the continuing ethical significance of such loss today.

Extinction, culture and more-than-human geographies

Extinction beyond the biopolitical

In contemporary wildlife conservation a creature's presence clearly matters, both actually recorded and potentially emergent (Hinchliffe, 2007). Yet, acts of classification, calculation, and distributional mapping often render such presence a series of multiple, differently valued, and sometimes contradictory collectives in (or across) space (Beirmann and Mansfield, 2014; Hodgetts, 2017). Such initiatives, read by geographers through Michel Foucault's 'biopolitics' (see Foucault, 2003), figure life primarily in terms of averaged characteristics, or norms. Despite a diversity of animal presence on the ground, overall conservation strategy deals in populations, and the massifying metrics of bio- or genetic diversity (J. Lorimer, 2006; Srinivasan, 2014; Hennessey, 2015).

Since the mid twentieth century contemporary conservation has been increasingly defined by the perception of an encroaching, human-instigated, 'sixth mass extinction' that it seeks to prevent (Adams, 2004; Kolbert, 2014). Extinction labels *collective* annihilation – potentially of entire taxa (see Smith-Patten *et al*, 2015). Whilst background rates of extinction may be 'ecologically necessary' – with fossil records suggests a species disappearance on average every four years, creating space for (better adapted) others to flourish –identified mass extinction events (where disappearance rates reach 50-1000 times background levels) indicate episodes of extreme ecological upheaval, generating much scientific and cultural interest (Heise, 2010).

Despite any extinction event entailing multiple, situated stories of decline – such as that of the Sutherland ospreys – lived differences dissolve with losses rendered in terms of quantifiable biological species units. In much conservation discourse, extinction is enacted through numbers. Calculations of vulnerability prioritise what must be saved. The 'Red List', compiled by the International Union for the Conservation of Nature since 1964 (see IUCN, 2012), exemplifies this biopolitical (and ethical) triage in action (Pooley, 2015). Meanwhile, conservation looks to genetics to promote new measures of collective diversity (or value) at molecular scales (Waterton *et al*, 2013; Hennessey, 2015). Hybrid forms compromising genetic purity are suppressed (Fredriksen, 2016). Violent incarcerations (and inseminations) accompany attempts to care for fragmented, remnant populations of rare species (van Dooren, 2014; Chrulew, 2011). Threatened creatures circulate through multiple spaces including digital databases, zoos and re-introduction centres (Whatmore and Thorne, 2000; Braverman, 2015). There remains limited scope for care-full attention to lived animal geographies within this biopolitical schema.

Marshalling recent humanities scholarship, I pay a different kind of attention to species life and death. Specfiically, work within 'extinction studies' (Rose *et al*, 2017 – further expanded below) offers opportunities for staying with the particularities of past osprey presence, and telling the story of the Scottish birds' decline *and* return whilst, at the same time, keeping hold of what *remains lost*. Grouping creatures into collectives on the basis of apparently essential qualities renders them mere 'units of

exchange' (Mitchell, 2016: 34), ultimately 'killable' to secure species wellbeing (Haraway, 2008; Srinivasan, 2014). Yet crucially, such 'species thinking' fails 'absolutely' to recognise 'what […] is actually lost' through extinction (van Dooren, 2010: 272). The vital relations and contingent differences comprising actual *ways of living* – what Thom van Dooren terms 'flight ways' (2014) – are excluded from any such biopolitical reckoning with environmental destruction. Writing within the environmental humanities (Rose *et a*l, 2017), as well as geography (see Van Patter and Hovorka, 2018: 291), has challenged species essentialism and concomitant conservation discourses of the 'greater good'. Increasingly, 'species' – as atomised units of concern and a 'concrete phenomenon of nature' (Mayr, 1996: 263) – become 'unthinkable' within posthumanism's rhizomatic ontologies (Haraway, 2016: 57; Whatmore, 2002).

More-than-human cultural geographies

To expand a sense of what is at stake in extinction, I make geographical and historically specific osprey 'ways of living' tangible through the notion of 'animal culture'. 'More-than-representational' (Lorimer, 2005) cultural geographies are just as evidently 'more-than-human' (Whatmore, 2006; J. Lorimer *et al*, 2017). They elude explanation merely in terms of autonomous, exceptional human figures (Whatmore, 2002; Hird, 2010; K. Anderson, 2014). Given 'making worlds is not limited to humans' (Tsing, 2015: 22), consideration of osprey culture is entirely appropriate amidst geographical scholarship long attendant to ways of living, doing and distributing natures (Anderson *et al*, 2002; Kirsch, 2014).

And yet, concern with 'culture' in geography remains largely human-focussed (Anderson *et al*, 2002: 18-21; Anderson, 2014; Hodgetts and Lorimer, 2015). Meanwhile, biologists, particularly primatologists and cetologists, have long debated the existence of nonhuman cultures (see Laland and Galef, 2009; Whitehead and Rendell, 2015). Indeed, culture appears a practical (if implicit) consideration for many conservation scientists. Van Dooren (2014; 2016) describes various instances where the management of captive-bred birds – such as crows and cranes – involves carefully supporting the development of an 'authentic' species being comprising the behaviours, perceptions and vocalisations that encompass a 'wild' subjectivity. Such examples feature plastic animal subjects, and testify to the multiple forms of 'animality' possible within different assemblages (Lestel, 2002).

Championing early critical attention to animal geographies, Chris Philo and Chris Wilbert emphasised the need for attention to animals' own geographies – their 'beastly places' (2000: 5) – alongside the social construction of 'animal spaces'. Although methodological and conceptual developments have favoured the former (Hodgetts and Lorimer, 2015), there is growing energy within more-than-human geography to explore the spatial character of animal life beyond its 'placing' by humans (H. Lorimer, 2006; Johnston, 2008; Buller, 2014, Buller, 2015; Van Patter and Hovorka, 2018; J. Lorimer *et al*, 2017). Animals, figured as 'geographers too' (Buller, 2015: 380), enact spatial lives and attachments. Birds, recognised as 'geographical creatures' (Steinberg, 2010: iii), invest significance in place through migratory

refrains, perceptions and attachments. Such geographies characterise the 'flight way' of osprey existence.

Through the osprey's story I challenge the 'residual humanism' (Lulka, 2009) surrounding cultural geography's central concept: culture. I argue that avian cultures reflect creative capacities to find diverse ways of inhabiting with (or against) the limits of an environment, demonstrating non-linear, 'affective', ecologies (Hustak and Myers, 2012). They take material form through 'non-essential' behavioural adjustments – such as nest preferences – shared socially between groups of birds, and with neither genetics nor environmental factors providing a 'truly satisfying' explanation of their appearance (Lestel, 2014b: 98). Thus, ospreys have a heritage exceeding biology, including group traditions, spatial arrangements and individual experience (Lestel, 2011: 84), which constitutes their very 'personhood' (Ingold, 1994).

I engage osprey cultural geographies via a hybrid conceptual frame (see Hovorka, 2017) drawing inspiration from 'speculative' approaches to ethology (the science of animal behaviour). Such work continues the maverick, creative, creaturely spirit championed by early pioneers of ethological study (see H. Lorimer, 2009). Rejecting a traditional, 'Cartesian-realist' ethology equating behavioural signals with fixed, universalising behavioural models, scholars including Vinciane Despret and Dominique Lestel propose a more open-ended consideration of animals, and their capacity to form contingent communities of meaning and relating (Despret, 2013).

Agential capacities are 'characterised by their historicity' (Lestel, 2002: 58), and constitute an open, empirical question (Despret, 2006).

Culture is thus figured with an emphasis on affect and sense (Lestel, 2014b: 95). I emphasise a corporeal reading of 'affect', foregrounding: the body's capacity to register the impress of worldly forces; the manner in which such impressions mediate a body's potential capabilities; and the various forces that emanate *from* bodies to enact similar mediations upon surroundings and other bodies (Anderson, 2014). Specifically, I apply Sara Ahmed's concept of 'orientation' to characterize 'different ways of registering the proximity of objects and others' (Ahmed, 2006: 3) as subjects affect and are affected by worlds. Orientations capture *how* spaces are affectively inhabited: the aspects towards which the body extends, or from which it retracts (Ahmed, 2010: 29). I (and others - Wright, 2015) see value in extending Ahmed's thinking beyond humans. In an account of past and present osprey nesting, orientation directs attention to the specific affects of a bird's worldy situation, its 'point of view' (Ahmed, 2006: 12) as an emergent, multi-sensory, perceptual attunement (Stewart, 2011).

In this manner, animal – specifically, avian – cultural life might be mapped, as Deleuze and Guattari suggest, by virtue of 'counting its affects' (2013: 299). That is, by documenting site- and relationally-specific ways of living as part of always-hybrid communities (Lestel, 2014a); or through attention to the (re)articulation of animal being amidst particular 'atmospheres' or fields of forces (J. Lorimer *et al*,

2017). Exploring more-than-human cultural geographies therefore requires attention to processes of 'learning to be affected' by the world, as to mediate future meetings (Despret, 2004: 131). Arising from assembled agential capacities to perceive and respond, 'different worlds […] come into view'. In turning toward these worldly offerings, bodies acquire 'the very shape of their direction' (Ahmed, 2006: 15-16). Understanding encounters with place, objects or 'others' requires situating subjects amidst 'conditions of their arrival' (Ahmed, 2010: 33) and histories of relating. How ospreys and nest sites become available to each other is a contingent process. Bodies and places are entrained into the refrains of migration, assembly and return, weaving together a creaturely ecology (H. Lorimer, 2009).

Osprey nesting geographies cohere as 'traditions' – social learning across generations (McGrew, 2009) – marking out specific forms of difference *within* the blanket category of 'genetic species'. These geographies emerge through the accumulation of more-than-human traces – nests, perches, migration routes, feeding grounds. In turn, attention to traces and trajectories proposes an ecology of dynamic *places*, as opposed to static *habitats* (Massey, 2005; van Dooren and Rose, 2012: 10).

To conclude this section: cultural geography - in concert with scholarship drawn from across the environmental humanities - has both scope and resource to engage more-than-human culture. The specifics of 'nonhuman' presence matter, revealing difference and diversity (see Lulka, 2009: 382). Attention to animal culture means examining how orientations of creaturely being emerge in relation and become

318 sustained through inheritance. Over the remainder of the paper I discuss the osprey
319 in Scotland, making specific lives (and losses) visible and significant amidst
320 processes of mass death.
321
322 **An osprey cultural community**
323 Ospreys are creatures with the capacity to form, share and inherit place attachments.
324 On the basis of shared orientations towards 'nestable' sites I advance the claim that
325 nineteenth-century Scottish ospreys constituted a now-lost cultural community.
326
327 Nesting is a fundament of bird life, offering containment, insulation and protection
328 for eggs and young (Hansell, 2000). Sites of vital reproductive work (biological and
329 cultural), nests are 'key nodes' (Reinert, 2013: 17) connecting individual existence to
330 the assemblage of collective being (Chrulew, 2011: 147). One can understand nests as
331 'animal architecture': nonhuman structures affecting local stability amidst volatile
332 environmental conditions (Hansell, 2000). Richard Dawkins theorises such
333 constructions in terms of an 'extended phenotype': the blueprints for building being
334 genetically encoded, as much a reflection of evolutionary development as
335 physiological capacities (Dawkins, 1982 in Ingold, 2000). Today, however, biologists
336 emphasise multiple inheritance systems *beyond* the genetic (e.g. Laland and Galef,
337 2009). Nests offer an example of 'niche construction'. Coined by biologist John
338 Odling-Smee, this concept refers to species' capacities for altering environments,
339 maintaining spaces across generations that mediate selection pressures and enable

340 the emergence – and persistence – of particular forms of (social) life (Laland *et al*,
341 2016).
342
343 My own speculative reading frames situated niche-building by a particular group of
344 the same 'species' as demonstrative of cultural diversity. I follow Tim Ingold (2000:
345 175) in rejecting the genetic essentialism of 'extended phenotypes', treating animal
346 dwelling as embodied, perceptive, active.
347
348 *Cultures of nesting*
349 Ospreys historically display wide-ranging recognition for 'nestable' places. By
350 nestable I mean evoking the capacities for successful nesting. This definition is
351 derived from Gaston Bachelard's phenomenological account of nesting as the
352 expression of locatable 'confidence in the world' (1994: 94-103). Crucially, such a
353 phenomenology defers to the animal: I place significance in where (and how)
354 ospreys direct perception.
355
356 Cultural activity is embodied: the potential capacities of creatures in relation to
357 environmental affordances define the limits of emergent cultural permutations
358 (Lestel, 2014b). Consequently, commonalities exist between osprey nest sites
359 globally. Proximate (<20km), plentiful fishing is key. Likewise, many birds favour
360 prominent, elevated, open sites: 'landmarks' for human and osprey alike (Poole,
361 1989: 85). Such features offer easier landings when laden with prey, and a vantage to
362 spot intruders (Hardrey *et al*, 2009). Being large raptors, osprey eyries (nest

363 structures) often exceed a metre in diameter. Viable sites offer a stable base for the
364 amassed sticks (and supplementary materials) held together by friction (Dennis,
365 2008).
366
367 Many places have hosted ospreys, so how do differences in site preference emerge?
368 Some attention is given to the affects of site attachment in accounts of osprey
369 nesting, noting the 'magical attraction' (Poole, 1989: 89) of 'special places' (Newton,
370 1979: 39). I offer here a speculative account of nesting processes, contextualising
371 ospreys within their affective ecologies, and connecting emergent orientations to site
372 within birds' unfolding 'lifelines' (Ahmed, 2006: 17).
373
374 In forming attachments to specific places, male ospreys demonstrate a particular
375 tendency to display 'natal philopatry': upon maturity they are likely to return to
376 their 'birth region' to breed. Sightings and recoveries of colour-ringed ospreys in
377 Scotland found 25 of 29 recorded birds nesting within 50km of their natal site – and
378 17 within 25km (compared to 2 of 34 females) (Dennis, 2008: 109). Results from
379 studies involving the ringing of Fennoscandian ospreys propose that 'a circle drawn
380 at 50km radius of the birth place' would account for over 40% of ospreys, again
381 reflecting the propensity for male birds to inherit attachments to place (Newton,
382 1979: 176). With regard to attachments to particular nesting *situations*, young ospreys
383 show a preference for sites echoing the characteristics of natal nests. Such a process
384 of 'imprinting to area' (Newton, 1979: 282) is elsewhere evoked to explain, for
385 example, the increasing colonisation of utility structures across generations by

386 ospreys in Europe (Meyburg *et al*, 1996). It is suggested that early flights from the
387 nest might orient fledgling ospreys to their surroundings, making 'sticky' (Ahmed,
388 2010) certain features within emergent avian geographical perceptions. Together,
389 such mechanisms demonstrate young ospreys' 'ontological openness' (van Dooren,
390 2014: 102) for geography.
391
392 Once a pair of ospreys has settled a site they will generally return to the same nest
393 annually, so long as both survive migration and the site remains productive (Poole,
394 1989). In this way, as adults maintain eyries, preferences for region (through male
395 progeny) and nesting situation become inheritable. Subsequently, orientations
396 towards particular *kinds* of nest site emerge as 'local traditions of preference'
397 (Newton, 1979: 82; Poole, 1989: 89).
398
399 Osprey nesting preference thus enacts landscape as a communally-inherited,
400 'learned skill' (H. Lorimer, 2006: 504) and recognition of the post-fledging period as
401 crucial for assembling the geographical subjectivity of young ospreys informs the
402 contemporary practice of translocation. From 1996 to 2005 young ospreys were taken
403 from Scottish nests , cage-reared at Rutland Water, Oakham, and released at the
404 point of fledging. From 2001, the first of these birds returned to nest, establishing a
405 breeding population here (Mackrill *et al*, 2012). Given natal philopatry is unevenly
406 observed (and varyingly expressed) an additional outcome of this project included
407 the tandem emergence of an osprey community in Wales with dispersal on return
408 migration.

The relocation example attests that despite certain tendencies being recorded, geographical orientations are not pre-given. Rather, nesting geographies remain contingent over the life-course, textured by osprey experience, even 'memory' (see Despret and Meuret, 2016). Site faith is tied to the persistence of seasonal monogamy. If birds die on migration their remaining partners will likely return, drawn north by an enduring place association. Equally, sites can be abandoned if eggs or young are lost due to extra-species intrusions or storms (Hardey *et al*, 2009). In this way, nests are (re)opened to colonisation by roving, nestless birds, entrained into new sets of osprey relations. A site's 'stickiness' for particular individuals reflects an on-going, creaturely storying of place (van Dooren and Rose, 2012). I turn to explore such processes at work amongst the ospreys of nineteenth-century Scotland.

Scottish osprey culture

Several authors label the demise of the Scottish osprey as 'extinction' (Brown, 1979; Poole, 1989; Kitchener, 1998; Dennis, 2008). Yet, within a biological species-centred definition of extinction such loss would be termed 'extirpation': the eradication of a given *population* of a species 'in a specific area' (Smith-Patten *et al,* 2015: 482). Extirpation implies that losses only register significance if *genetic* survival or diversity is threatened. Here, in developing a conception of extinction in which *ways of life* are at stake, I problematise extirpation as a concept for the way in which it renders disparate populations interchangeable.

Extinction studies scholarship challenges the essentialism inherent to biological definitions of species, expanding the registers of significant loss (Mitchell, 2016). Doing so requires telling alternative 'extinction stories': offering generative openings (van Dooren, 2010: 272-273) onto the 'intimate peculiarities' of environmental destruction (van Dooren, 2014: 7-8; Rose *et al*, 2017). Extinction is refigured as a broader, slower process of detachment from conditions of dwelling in which the end of a way of life precedes the disappearance of the last, lingering one (Rose, 2012). Absence is felt beyond the biological, encompassing lost vocabularies, behaviours, sensory knowledges and future possibilities (Smith, 2013). Recognising such losses attests to more-than-human lives lived amidst relational *communities*, characterised by situated forms of animal existence and worlding (see Yusoff, 2012: 587). As Despret and Meuret articulate:

'Extinction begins when the world to which an animal was associated is reduced to nothing, or almost nothing. Extinction begins when the ways an animal composes the world and composes with the world are ended, when the ways he or she makes a world exist, according to the ways his or her ancestors had created it, have disappeared' (2016: 28-29)

In this spirit, I characterise the nineteenth-century Scottish osprey and its eradication with reference to a collectively constituted orientation towards place. Doing so makes legible osprey cultural geographies as a register of significant loss.

Prior to disappearance in the early twentieth century, there is limited data regarding the osprey's extent in Britain. Virtually no records precede the 1800s (Waterston, 1962). Likewise, there is little evidence as to its persecution, particularly outside of Scotland. By 1800 the birds had probably disappeared from Ireland and a handful remained in England until 1847 (Lovegrove, 2007). A clear (if loosely documented) trajectory of decline accompanies this geographical contraction. With the osprey confined effectively to Scotland by 1850, one estimate puts their numbers between 40 and 50 breeding pairs (Dennis, 1991). The same year, however, other writers note the ultimate demise of the Sutherland-based population (see Brown, 1979; Lovegrove, 2007) described barely a decade earlier by Scottish naturalist William Jardine as so abundant that one might see four or five birds a day in certain localities (Waterston, 1962: 81; also Selby, 1836: 287). By 1895 there were at most four pairs nesting (Harvie-Brown and Buckley, 1895: 71). This had declined to just two by the early years of the twentieth century (see Cameron, 1948), and a final (recorded) pair bred at Loch Loyne in 1916 (Gordon, 1949).

A notable feature of nineteenth-century accounts documenting encounters with Scottish ospreys is their descriptions of nests, which suggest particular site preferences. In northwest Sutherland, ospreys nesting on rock and ruin sites – rather than the trees recorded elsewhere – were apparently common. For example, in Charles St John's (1863: 138) writing he describes eyries 'placed either on the highest part of some old ruin, on the peak of some rock which stands out from the water in a

lonely highland loch, or, rarely on the very summit of an old tree'. Elsewhere, Jardine alleged to *only* have observed such behaviour, asserting Scottish nests were 'always' sited on ruined structures (Jardine, 1838: 184). Despite trees in abundance, ruins were 'preferred if near' (Jardine, 1832 quoted by Yarrell, 1871). Similarly, ornithologist William Yarrell, writing five years later, endorsed Jardine's descriptions.Nesting ospreys are recalled on 'rocky islets' and 'old ruins', only 'sometimes on high trees' (1871: 32). In 1879, one newspaper article boldly claimed ospreys built on trees only where ruins or rocks were not available ('Loch-an-Eilan and its Ospreys', 9 June 1879). That rocks and ruins were central to natural historians' understanding of the Scottish osprey, suggests their prominence within the birds' own spatial perception during this period.

Ruin eyries offer an early example of the osprey's widely documented adaptability to local conditions. The earliest record of ruin nesting occurs in the late-eighteenth-century travel writing of Welsh naturalist Thomas Pennant (Baxter and Rintoul, 1954). At Loch Lomond, he describes 'sea eagles'[1] that 'quit the country in winter' nesting on the ruins of Inchgalbraith island (Pennant, 1771: 80). Their presence is corroborated in other late-eighteenth-century accounts – notably the writings of Samuel Johnson, and within Gilpin's *Observations on the Picturesque*, compiled 1776 (1792: 27). Birds allegedly returned here until at least 1840 (Colquhoun, 1840), suggesting cross-generational inhabitancy. In the diaries of Elizabeth Grant (1972:

[1] Whilst Pennant describes the birds as 'sea eagles', it is generally accepted that he was referring to ospreys (*Pandion haliaetus*) and not white-tailed eagles (*Haliaetus albicilla*), also persecuted during this period (see discussion in Baxter and Rintoul, 1954).

60) – of the Grants owning Rothiemurchus estate, Speyside – ospreys appear nesting atop ruins at Loch an Eilein in 1808. Like Inchgalbraith, this site was long tenanted; ospreys appearing here (with periods of absence) until 1902 (Cash, 1914).

Many of the structures reportedly colonised – including Kilchurn Castle, Loch Awe (Pearson, 1987); Lochindorb Castle, Lochindorb (Wilson, 2007); and Ardvreck Castle, Loch Assynt (St John, 1884) – if not already long-abandoned (like Lochindorb) were certainly in a ruined state by the nineteenth century (see Simpson, 1937). As Highland society was violently restructured under Hanoverian rule, possibilities emerged for recombinant osprey ecologies. The avian attraction of such sites is clear: they were (relatively) stable, prominent, and often near water. I speculate that the perception of ruins as 'nestable' may reflect their resonance with the form of those rock sites utilised elsewhere. In such a reading, a distinctive culture of nesting emerges at the 'contact zone' (Haraway, 2008) between birds and the detritus of human activity, subsequently propagated across generations.

The distribution of this practice, and its documented persistence amidst periods of absence and re-colonisation, suggests rock and ruin nesting was not exceptional but typical of this osprey community. Sites were made recognisable according to the involvements orienting avian sensibilities to place. Once settled, the on-going association between birds and site emerged via the affects of nesting elaborated above. Ospreys nested on tree sites too (as observed today) but this does not contradict a claim that their spatial perception of nestable landscapes was

demonstrably *different*. If we understand extinction to result in a 'diminishment of the prospects for becoming' (Whale and Ginn, 2017: 98) then the demise of the Scottish osprey is significant, their absence marking the end of a particular kind of *being*.

Unravelling a cultural community

Conceptualising osprey existence as a communally-sustained way of life better-captures what is at stake in extinction. Attention to animals' geographies foregrounds the lived spatiality of extinction stories. Scottish ospreys, as a cultural community, would become extinct as intergenerational ties were severed or unravelled (van Dooren, 2014: 22-27). Where survival necessitated the forging of 'liveable collaborations' (Tsing, 2015: 28), osprey deaths occurred as violent and death-filled relations proliferated. Importantly, the geographies and affects of human-led extinctions appear less spectacular or discrete than the distributed aggregate of 'business as usual' (Yusoff, 2012). The extinction of osprey culture occurred with a sustained and cumulative violence enacted across lived geographies and down through generations.[2]

[2] Due to the constraints of space this paper focuses primarily on the impacts of persecution carried out against ospreys in Britain and Ireland, rather than across the full stretch of their migratory geographies between Britain and West Africa.

Forces of extinction

In the nineteenth century, two sources of persecution emerged and combined to whittle away osprey existence. The first was a natural history epistemology of specimen collection, credited with fragmenting populations in the north. The second was highland sport, linked to the killing of ospreys on managed estate lands at the nest and on migration (McGowan, 2009).

Regarding collecting naturalism: a specific enthusiasm for the study and classification of birds, emerging from the late eighteenth century, was predicated upon the categorisation and comparison of specimens and eggs (see Farber, 1997). Charles St John and William Dunbar's Sutherland tour typifies the 'peak' of such collecting enthusiasm during the 1840s, allegedly contributing to the near-total annihilation of the region's ospreys. Collectors also visited other well-known sites, such as Loch an Eilein (see Harvie-Brown and Buckley, 1895: 75). There, the nest was robbed by collector Lewis Dunbar (brother to St John's companion) annually from 1848 to 1852, his spoils going to southern clients (Wolley and Newton, 1864: 58-66). Such actions prompted the ospreys to desert the ruin for over two decades (Cash, 1914).

Alongside collecting, ospreys suffered the wrath of landowners managing estates for Highland sport. The arrival of the Royal Family on Deeside popularised a nature-culture of romantic Highlandism, including the hunting of red deer (*Cervus elaphus*) and grouse (*Lagopus lagopus scotica*) (Pringle, 1988). Hired gamekeepers zealously

563 pursued all raptors as 'vermin', fearing the propensity of some to predate game
564 (Lovegrove, 2007). Definitive figures for such destruction are elusive, with limited
565 information sourced from surviving estate and taxidermists' books (see McGhie,
566 1999). Oft-quoted records for Glengarry estate between 1837-1840 suggest the scale
567 of persecution: over three years 1,498 birds of prey were killed, including 18 ospreys
568 (given in Ellice, 1898: 27). Appreciating that by 1850 the *entire* Scottish community
569 likely comprised 40-50 breeding pairs, such figures suggest major losses on estate
570 lands.
571
572 The relationship between osprey nesting culture and the impacts of persecution is
573 hard to determine. Their nests may have been more accessible than those of other
574 raptors (see Selby, 1836: 286). Moreover, a strong 'faith' for nests and favoured
575 perches made them easier to kill or trap (Lovegrove, 2007: 107). Sportsman John
576 Colquhoun recalls how, 'aware of their habit', he rowed to Inchgalbraith ruin,
577 waited, and killed both ospreys upon their return, emptying a site 'occupied for
578 generations' (Colquhoun, 1840: 86-7).
579
580 *Protection and decline*
581 On some estates ospreys were given sanctuary. Eyries around Loch Arkaig were
582 protected under instructions from laird Donald Cameron of Locheil until abandoned
583 in 1914 (Cameron, 1948). At Loch an Eilein, resident ospreys were celebrated by
584 early-century artists and travelers in search of the picturesque (see MacCulloch,
585 1824: 400; Beattie, 1834: 75). After visiting in 1879, HM Inspector for Schools William

586 Jolly, writing for *The Scotsman,* bid the public, 'go to Rothiemurchus!' where they
587 might come as close to the birds as to 'a specimen in a museum' ('Loch an Eilan',
588 1879: 5). Subsequent tourist interest stimulated the estate's proprietors to safeguard
589 the nest, banning boats on the loch and setting keepers on watch (see Lambert, 2001).
590
591 Despite attempts to prevent persecution, 15 of 24 recorded osprey breeding attempts
592 at Loch an Eilein between 1846 and 1899 culminate with eggs being taken (Ritchie,
593 1920: 192). The removal of eggs likely spelled the end of the season. Given threats
594 faced on migration – estimate mortality rates for ospreys in the first year, derived
595 from observations in the Eastern USA, are around 57% (Newton, 1979: 368) – any
596 disruption to reproduction threatened a small community's capacity to endure. By
597 1871 the osprey was being described as 'the rarest of our native species' (Gray, 1871:
598 18),
599
600 Even where successful, isolated protections achieved little given the mobile lives of
601 ospreys spanned a seasonal, migratory refrain. As early as the 1810s migrating
602 ospreys were shot annually in southern counties (Montagu, 1831: 347). The killing of
603 birds on the move evokes recent criticism of 'static' conservation initiatives that fail
604 to recognise animal mobilities (see Lulka, 2004; Reinert, 2015). The osprey's existence
605 in Scotland was sustained through a migratory assemblage. Death *en route* was not a
606 discrete event, but affected a delocalised, 'reverberating absence' (Reinert, 2015: 52)
607 felt through diminishing returns over following seasons. In autumn, birds travelling

608 south stopped to roost or fish in less-friendly landscapes (see Harvie-Brown, 1896;
609 Dennis, 2008).
610
611 Ospreys 'slipped through the cracks' of legal frameworks intended to protect them
612 (see Srinivasan 2013: 109). The earliest legislation to offer blanket protection to wild
613 birds, introduced in 1880, did little to stem the killing unless local councils granted
614 special protections . However, by 1896 extra protection applied to a handful of UK
615 counties. A leaflet published by the fledgling 'Society for the Protection of Birds' the
616 same year decried this 'patchwork' of legislation as fatally mismatched to avian
617 flight-ways (Harvie-Brown, 1896). Protections fitted to human political boundaries
618 did little for birds running 'a gauntlet of innumerable shotguns' (Kearton, 1899: 61)
619 across a mobile, migratory geography (Lulka, 2004).
620
621 The maintenance of an osprey nesting culture required annual supplies of 'young
622 blood' (Harvie-Brown and MacPherson, 1904: 204). Yet at home, and on passage, the
623 community was diminishing. In the final 12 years of attempted breeding at Loch an
624 Eilein, just five produced young. In both 1888 and 1896, intruding ospreys instigated
625 skirmishes in which the eggs were smashed (and, in 1888, a female was killed)
626 (Cash, 1914: 115). The result was a frayed, precarious existence for birds at the
627 'edge' of extinction (van Dooren, 2014). The last pair to breed at Loch an Eilein did
628 so in 1899, though single ospreys appeared until 1902. Elsewhere, they bred at Loch
629 Arkaig until 1910 and Loch Loyne until 1916. A significant and specific form of
630 osprey culture had vanished.

Hauntings of osprey culture

Today, absence haunts the nesting geographies of re-colonising Scottish ospreys. Before concluding, I argue that encounters with past osprey culture in the present are both possible and necessary in the context of technoscientific discussions of 'genetic rescue' (Heatherington, 2012), rewilding (Lorimer and Dreissen, 2014), and even 'de-extinction' (van Dooren and Rose, 2017). Haunted landscapes evoke the 'present-absence' of osprey life, serving to put contemporary avian geographies 'out of joint' (see Derrida, 2006). The notion of haunting emphasises the composition of geographies through absence as well as presence (Wylie, 2009). Sites such as those Sutherland lochs encountered by Waterston in the paper's opening – or the ruins at Loch an Eilein (Figure 1) – exhibit 'shadowy density' (Pile, 2005: 142). Their ghosts invite us into counter-histories; transforming, renegotiating and re-evaluating celebrated pasts (Gordon, 2008: 8). Taking osprey culture seriously creates space outside of triumphant conservation narratives to ask: what remains lost when a species *comes back*?

Avian spectres

More-than-human cultural geographies are woven from the affective traces of lived activities, relations and attachments. Such traces outlast the existence of their authors. They are witnessed, amidst the collapse of ecological communities, as animals remain drawn 'to places that no longer exist' (van Dooren, 2014: 66). At

653 locations including Loch Awe and Loch Maree, ornithologist Robert Gray recalls, in
654 the latter half of the nineteenth century, lone ospreys 'hovering in the vicinity of
655 islets where nests were formerly placed' (Gray, 1871: 18-19). Similarly, at Loch an
656 Eilein, single birds appeared for three years following the last successful breeding
657 (Cash, 1914: 157). These ghosts map more-than-human geographies of absence
658 affected by extinction. Osprey site faith manifests as a performative trace of the pan-
659 generational work of pairs to invest in and maintain meaningful places. Spectral
660 birds conveyed the futility of such work in Gray's time of writing. They signal that
661 the loss of 'connectivity and mutuality' required to sustain communities often
662 precedes their 'final death' (Rose, 2012: 138).
663
664 Cultural expressions of avian life also haunted encounters with re-colonising
665 ospreys. In 1955, word reached George Waterston in Edinburgh, newly recruited by
666 the RSPB, of the species' potential return. Travelling to Speyside to investigate, his
667 tentative plans, sketched in conversation with local landowners and Nature
668 Conservancy representatives, were guided by an understanding of *past* osprey
669 cultural geographies. He assumed the birds would surely attempt to nest on Loch an
670 Eilein's ruins – the site now home to a large jackdaw colony (*Corvus monedula*)
671 requiring removal before re-colonisation could occur ('Ospreys at Loch Garten', 2
672 July 1955). Upon their return, however, it became clear the birds had different
673 interests. Failing to breed in 1956 and 1957, eventually a pair settled atop a Scot's
674 pine in the marshland south of Loch Garten. Following the robbery of that nest, they
675 colonised another tree northeast of the loch in 1959. There they succeeded in rearing

chicks under RSPB guard and their kin continue to return to this day (Dennis, 2008). As other ospreys began to re-colonize – all tree-nesting – Loch an Eilein remained empty.

With jackdaws present, the ruin was a niche closed in ecological terms. Yet the enduring absence of ospreys from *all* former rock or ruin haunts in north and west Scotland (see Dennis, 1983; Thom, 198: 146) suggests such places are also no longer *culturally* available. The *orientation* of contemporary birds to the landscape is different. Today's ospreys are predominantly tree-nesting, like those in Scandinavia from where the current community is believed to have originated (Österlof, 1977: 75). These birds exist 'out of line' with the dimensions of a past affective community (Ahmed, 2010: 37). Culturally, they are 'strangers […] in a familiar land' (Lambert, 2011: 169).

Former sites like Loch an Eilein constitute 'signifiers for the dead' (Haraway, 2016: 69). I extend to place this concept developed by Haraway, after science fiction writer Orson Scott Card, to characterise the spectral baggage that accompanies creatures which, having evolved through symbiotic partnership, later find themselves abandoned after extinction. She uses the example of an orchid, its flower continuing to imitate the sexual organs of the now-absent bee once pollinating its kin. In a similar vein, writer Connie Barlow discusses 'ecological anachronisms' like the avocado. Characteristically large seeds and thick, oily flesh evoke the ghostly presence of the long-extinct jungle herbivores once facilitating seed dispersal

699 (Barlow, 2000). In the landscape the materiality of a previous osprey affective
700 ecology outlasts the birds' annihilation. These ruins and rocks, apparently
701 unrecognisable to contemporary ospreys, can still offer *us* a meaningful encounter
702 with past avian lives.
703
704 *Haunted geographies*
705 Appreciating a historical, cultural osprey existence attunes one in potentially
706 transformative ways to contemporary avian lives and landscapes. Annually in the
707 UK, the number and range of pairs expands (now 300 – Dennis, 2016, pers. comm.).
708 This growth has been aided by the construction of new nest sites since the 1970s, to
709 which ospreys increasingly adapt (Dennis, 2008: 131-146). Evidence from mainland
710 Europe suggests successfully colonising such structures affects subsequent
711 geographical preferences. Young born of platform nests appear predisposed to settle
712 similar sites elsewhere (Henny and Kaiser, 1996). Nearly 40% of ospreys in the
713 Scottish Highlands utilise human (re)constructed platforms over osprey-constructed
714 sites (Dennis, 2008: 142). They appear more tolerant of humans and elsewhere show
715 interest in landscape objects like utility pylons (R. Thaxton, 2014 – pers. comm.).
716 Arguably, a 'cultural shift' has occurred (Dennis, 2008: 130). The expansion of
717 conservation involvement with ospreys in the UK over the twentieth century
718 propagates new geographical associations within this re-colonised community,
719 activating new forms of osprey life (Garlick, 2017).
720

721 Meanwhile, ruins and rocks remain empty. On Speyside, attention to osprey culture
722 unsettles narratives of triumphant return. Since 1959, ospreys have nested within a
723 15-kilometre flight of Loch an Eilein. They catch their prey at the Rothiemurchus
724 estate fisheries, just four kilometres away (see Lambert, 1999). Such disjointed
725 geographies of presence and absence haunt one another (Pile, 2005). This haunting
726 emphasises qualitative differences in what it means to *be* a Scottish osprey, now and
727 in the past.
728
729 What does this change mean? Is an absence from rocks and ruins significant? In their
730 discussion of London's declining house sparrows (*Passer domesticus*), Whale and
731 Ginn document the responses of local birders. One interviewee expresses sadness,
732 but not merely at encountering sparrows less frequently. Rather, their rarity means
733 that encounters with these usually convivial birds are themselves different. In the
734 absence of other sparrows, '[s]omething is missing in the very appearance of
735 sparrows themselves' (Whale and Ginn, 2017: 22). This is profoundly unsettling.
736
737 I likewise find the changes that extinction has wrought for Scottish osprey life
738 unsettling. This is not a wish to wallow in the past or appeal to static concepts of
739 Nature. Neither do I want to neglect the flourishing of today's birds, whose success
740 is cause for celebration. Such nostalgia blinds us to the value of ecologies existing
741 now, despite past destruction (Tsing, 2015). But I do want the loss of nineteenth-
742 century osprey lives to *matter.* Cultural concern expands and thickens creaturely
743 presence in accounts of extinction and cautions against the arrogant presumption

744 that human innovation can *reverse* environmental wrongs. Rendering the decline of
745 historical animal culture as a *significant loss* invests it with ethical value (see Butler,
746 2009).
747
748 Understanding ecological existence in terms of shared cultural relations, rather than
749 interchangeable species units serving set 'functions', means recognising that the loss
750 of one set of beings engenders a host of (often unforeseen) communal losses (Smith,
751 2013). What potential cultures – what 'lines of flight' (Deleuze and Guattari, 2013)
752 onto new forms of being – have been foreclosed upon by the eradication of this
753 osprey community? Equally, what alternative futures are now possible, following re-
754 colonisation, that were not before?
755

756 **Conclusion**

757 This paper has drawn from the work of geography and the environmental
758 humanities to position 'animal culture' – the relationally-constituted, shared
759 orientations of a community of creatures – as a valid object of geographical inquiry.
760 Elaborated here in terms of material, embodied, affective and historically contingent
761 relations of perception, niche-building, maintenance, inheritance and site
762 attachment, osprey cultural geographies trace the lives of birds on 'beastly', dwelt
763 terms (after Philo and Wilbert, 2000; Johnston, 2008). I argue the lives of ospreys
764 matter on terms more than their contributions towards overall genetic integrity or
765 species survival. Tracing the geographies of extinction and conservation means
766 attending to the differently lived geographies collected under general categories of

767 'species'. Crafting more nuanced extinction stories stays with the trouble of
768 biopolitical conservation, and the (epistemological) violence of essentialist thought.
769
770 Such an argument demands a more speculative historical project, attentive to the
771 assembling of animal agency across sites and relations (Despret, 2013). My paper
772 demonstrates the potential to inject more lively animal presences into what might
773 otherwise persist as primarily anthropocentric historical projects, regaling things
774 *done to* – rather than *with* or *by* – other creatures (see Howell, *forthcoming*). Defining
775 the limits of this project remains an on-going concern. How far might the cultural-
776 historical animal geographies proposed here be extended into the past, and what
777 challenges arise when attempting to trace the stories of creatures less expressive of a
778 certain 'archival charisma'? More specific to my argument, can more (temporally)
779 distant extinctions be made to matter ethically as those closer to hand? I invite others
780 to consider these questions.[3]
781
782 Crucially, appreciating the manner in which the Scottish ospreys' cultural extinction
783 haunts contemporary landscapes counters the implicit narrative of conservation's
784 'molecular turn' (Hennessey, 2015) wherebyoften-distributed members of a species
785 are collected, known and secured in terms of contributions to genetic diversity
786 (Chrulew, 2011). Encounters with genetic material offer promises of technocratic
787 redemption through re-wilding, de-domestication, and de-extinction initiatives. Yet,
788 such narratives too-often require an essentialised animal referent, comprising little

[3] I am grateful to an anonymous reviewer for these reflections.

789 more than a collection of genetic traits and ecological functions; trading on classic
790 dichotomies that set animal existence apart from collaborative human becomings
791 (see Jørgensen, 2015).
792
793 Such thinking is evident in the osprey's story as early as 1949. An article
794 summarising the history of the birds in Scotland by naturalist Seton Gordon
795 concluded that whilst their eradication was lamentable, the reader should not fear:
796 'there is no danger of this fine bird disappearing from the face of the earth' (Gordon,
797 1949: 675). Such statements engage this 'fine bird' in terms of its collective
798 population status, rather than the myriad situated forms osprey life actually takes.
799 These sentiments resonate with contemporary conservation biopolitics in which
800 threats of extinction are evaluated at the scale of the species-collective. The promise
801 of scientifically-worked atonement goes unchallenged (van Dooren and Rose, 2017).
802 As long as *some creatures exist somewhere* nothing has truly been lost.
803
804 I have shown how telling stories about animal cultures makes the lived specificities
805 of animal presence legible, perceptible and the subject of care. For some conservation
806 biologists, recognising animal culture might mean acknowledging our
807 responsibilities to steward more-than-human 'cultural diversity' and ensure other
808 creatures achieve 'their varied cultural potentials' (McGrew, 2009: 69). As
809 cetologists Hal Whitehead and Luke Rendell note, incorporating culture into existing
810 conservation frameworks challenges the genetic basis upon which wildlife 'stocks'
811 are been safeguarded, or sacrificed (e.g. to meet hunting quotas). For whales,

812 'culture complicates conservation' (Whitehead and Rendell, 2015: 268). It is therefore
813 vital that more-than-human geographers engage with the arguments around the
814 existence, character, epistemology and significance of culture beyond humanity.
815
816 The return of the osprey is a story of conservation triumph. The re-colonisation of
817 Britain's skies by native raptors is widely (and rightly) celebrated (Lambert, 2011).
818 However, narratives of success must be read critically. Exploring the meaning of
819 extinction beyond the loss of biological species does not mean abandoning the idea
820 that extinction is irreversible (as some suggest – Smith-Patten *et al*, 2015). Rather, it is
821 to question what counts as *significant* loss. Given the compatibility of genetic rescue,
822 restoration and rewilding schemes with neoliberal discourse – the fear that relational
823 ontologies of nature render ecology fungible (see J. Lorimer, 2015) – I make this
824 point emphatically. No return is clean, things remain lost.
825

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