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Title page

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Title: The reintroduction of beavers to Scotland: Rewilding, biopolitics, and the affordance of non-human autonomy

Running head: Rewilding and non-human autonomy

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Abstract and keywords page

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Abstract

Rewilding is a distinctive form of ecological restoration that has emerged quite publicly within environmental policy and conservation advocacy circles. One of the fundamental tenets of rewilding is its emphasis on non-human autonomy, yet empirical examples that examine non-human autonomy are currently limited. While there is a growing body of literature on the biopolitics of broader environmental conservation strategies, there is comparatively little scholarship on the biopolitics of rewilding. This paper argues that autonomy should not be used as a boundary marker to denote ‘wild’ non-humans, but as a situated condition that is variable across locations. It offers an empirical study of the biopolitics that govern the different expressions of non-human autonomy at two different locations in Scotland, where beavers have been reintroduced. The findings reveal how, depending on location and context, modes of governance related to rewilding strategies co-exist and interplay with animal autonomy and forms of power in contradictory ways.

Main Text

1. INTRODUCTION

Rewilding is a distinctive form of ecological restoration that has emerged quite publicly within environmental policy and conservation advocacy circles. While there have been some recent discussions about rewilding from a theoretical perspective within the social sciences and humanities (for example Gammon, 2018; Jørgensen, 2015; Prior and Ward, 2016; Lorimer and Driessen, 2014; Lorimer and Driessen 2016), analyses of rewilding underpinned by empirical research within this body of literature are relatively slight (for notable exceptions see for example Prior and Brady 2017; Crowley et al. 2017; Lorimer and Driessen 2013; Wynne-Jones et al. 2018). One of the fundamental tenets of rewilding is a focus on non-human autonomy, yet empirical examples which examine non-human autonomy within rewilding practice are lacking (see DeSilvey and Bartolini 2019 for an exception). Although there is a growing body of literature that pays attention to the biopolitics of broader environmental conservation strategies (Lorimer and Driessen 2013; Biermann and Mansfield 2014; Srinivasan 2014; Hodgetts 2016; Cavanagh 2018), there is relatively little empirically-based work on the biopolitics of rewilding.

This paper provides a detailed empirical study of non-human autonomy across two sites in the rewilding of beavers in Scotland. Our analysis focuses on how expressions of autonomy are operationalized to varying degrees across two different spatial-temporal political contexts of rewilding in Scotland. The first is Knapdale Forest, the official site of beaver reintroduction, while the second context is the Tayside river catchment, an unofficial site of beaver reintroduction. The study examines the biopolitical techniques used to determine beaver autonomy and the extent to which rewilding projects intersect with governance and conservation practices and other forms of

power. The findings highlight how beaver autonomy and power coalesce and how modes of governance co-exist and interplay with non-human autonomy in sometimes contradictory ways.

2. REWILDING, AUTONOMY AND BIOPOLITICS

The concept of rewilding can be traced back to the US-based *Wildlands Project* founded in the early 1990s. An early definition was subsequently provided by Michael Soulé and Reed Noss, two conservation biologists involved in the *Wildlands Project*, as: ‘the scientific argument for restoring big wilderness based on the regulatory roles of large predators’ (Soulé and Noss, 1998: 22). Since the paper was published, there has been a rapid proliferation of conceptualizations and definitions of rewilding over its relatively short lifespan (for commentary on this proliferation, see for example Gammon 2018; Jørgensen 2015; and Pettorelli et al. 2018), many of which do not posit either ‘big wilderness’ or the return of ‘large predators’ as objectives for rewilding. Indeed, the restoration of non-apex species, the ‘de-domestication’ of ungulates, and the removal of barriers within landscapes that prevent the movement of wild species, such as dams and fences, are all now considered to be components of rewilding practice.

This has led some to observe that ‘rewilding’ lacks definitional precision, making it a ‘vague’ and ‘fuzzy’ concept (Jørgensen, 2015), while others have stated that rewilding cannot be distinguished from other ecological restoration practices (Hayward et al. 2019). We have argued elsewhere that there is coherence between different definitions of rewilding, and that rewilding can be understood as a distinctive form of ecological restoration (Prior and Ward 2016; see also Gammon, 2018). While other types of ecological restoration are enacted through sustained human intervention and stewardship, rewilding is grounded in an ethos of relinquishing direct human management of wild organisms or ecological processes, and one that foregrounds the self-directed

actions of non-humans which we conceptualize as the affordance of non-human autonomy (Prior and Ward 2015).

Such non-human autonomy in the context of rewilding should not be read as a discontinuity between humans and non-humans; it is not an attempt to radically sever the ‘natural’ from the ‘cultural’ as with wilderness management (Prior and Brady, 2017). Instead, rewilding places emphasis on - and indeed normatively celebrates - the agency of non-humans in often complex social-ecological systems. Non-human autonomy, when applied to populations and communities of species, includes (but is not limited to) an ability to move, grow, procreate, and die, and when applied to ecological processes an ability to erode, flood, and decompose, in ways that are not managed or coordinated by direct human interventions.ⁱ It is this affordance of non-human autonomy that distinguishes rewilding from other ecological restoration strategies (and indeed other modes of environmental conservation practice (Prior and Brady 2017)). As Tanasescu (2017: 335) notes:

‘It is autonomy which rewilding ‘restores’, allowing it to become truly different from classical restoration by unshackling its historic baselines and by no longer needing prolonged human management to keep an ecosystem in a preferred state.’

This rejection of humans maintaining ecosystems in a preferred state, is potentially at odds with other conservation strategies:

‘Rewilding by its nature implies a more dynamic and functionalist approach with less predictable or desirable outcomes for some species, possibly even those of high

conservation concern, which were favored by past human interventions and may not do so well under rewilding.’

(Lorimer et al., 2015: 53)

Indeed, because the realization of non-human autonomy is an objective of rewilding, wherein ecological change (rather than managed stasis) is valued, rewilders accept that the future loss of certain species from a given landscape is a likely outcome of rewilding, as is the acceptance of ecological ‘experimentation’ and surprise (Prior and Brady 2017; Lorimer and Driessen 2014). Within this formulation of conservation practice then, we find a distinct form of biopolitics at work.

The Foucauldian notion of biopower refers to the way that power can be operationalized to ‘make live and let die’; in juxtaposition to the notion of sovereign power which is the power to ‘take life or let live’ (Foucault 1978: 136-137; for an excellent review of political ecology debates of biopower see Cavanagh 2018). While not mutually exclusive, biopower is further differentiated into anatomo-politics (the governance of individual bodies) and biopolitics (the techniques of power targeted at the level of populations). Biopolitical scholarship therefore concerns the administration of *populations* and focuses on the techniques for the management of ‘social, cultural, environmental, economic and geographical conditions under which humans live, procreate, being ill, maintain health or become healthy, and die’ (Dean 2010: 99). Scholarship in the vein has contributed to understanding how power is enacted through multiple logics, strategies and spatial practices across and within human populations.

Foucault's notion of biopolitics has also recently emerged in scholarly discussions of nature by those who seek to develop a more-than-human understanding of knowledge-power relationships (Whatmore 2002). 'More-than-human' scholars resist and rework human-centred conceptions of agency to propose a non-deterministic acknowledgement that socio-material change occurs through the combined agency of human and non-human beings, or what they call 'more-than-human' life. Scholars of more-than-human geographies and Science and Technology Studies (STS) have argued for the inclusion and understanding of more-than-human actors in biopolitical investigations, insisting that we must acknowledge more-than-humans as active agents in socio-material change, and in doing so develop methods that can better elucidate the messy reality of human-animal relations (Haraway and Teubner, 1991; Holloway 2007; Collard 2012; Puig de la Bellacasa 2010; Srinivasan 2013; Wolfe 2012; Haraway 2013). Haraway (2013) argues that by recognizing and allowing for more-than-human agency in our biopolitical investigations, we open up the possibility for understanding how humans and more-than-humans (and their environments) are co-constituted in relation with each other. Such arguments have been significantly developed by human geographers (perhaps most notably by Wolch and Emel 1998; Philo and Wilbert 2000; Whatmore, 2002; Hinchliffe and Whatmore, 2006), who suggest a relational ontology for understanding all life, where humans *and* more-than-humans are recognized as having the capacity to act as central agents in collective entanglements.

What emerges from these discussions is an ongoing 'lively' debate which deploys relational ontologies to better understand and account for *all life* in our hybrid world, largely through the emergence of work exploring human/ non-human (animal) encounters and relations through the everyday (Whatmore 2002, Lorimer 2010, Collard 2012, Hinchliffe et al 2005).

More recently, scholars have used biopolitical approaches to more-than-humans for investigating conservation practice. Conservation itself can be understood as a biopolitical project; one which centres on the governance of non-human life and on *making* (some) *nature* 'live' (Biermann and Mansfield 2014; Biermann and Anderson 2017). Biermann and Mansfield (2014) have drawn on the notion of biopolitics to interrogate the logics of conservation and race, to show how modern conservation science is still bound-up in truth claims of biodiversity-as-purity, a seemingly contradictory logic which generates interventions that foster particular kinds of more-than-human populations, while 'letting die' 'threats' to the diversity of ecosystems.

Competing logics of diversity-as-purity and non-human autonomy are relevant to rewilding as it is a conservation practice framed by a logic of enhancing ecosystem function (often with the inference that biodiversity will be 'restored' through rewilding), as well as being grounded in an ethos of more-than-human autonomy. Unlike other conservation practices though, whilst restoring ecosystem function is a key element of rewilding narratives, the 'desired state' of a rewilding environment is not some 'fixed' notion of purity but is experimental and open to 'ecological surprises' (Lorimer and Driessen 2013). This prioritization of non-human autonomy and open-ended ecological surprises can be somewhat challenging to those concerned with restoration of ecosystem functions, particularly if one species is understood as having 'too much' autonomy. Indeed, much of the 'modern conservation' drive to foster 'diverse life' insists that some species should not have too much autonomy when their agency threatens diversity (Vermeij 1996). Such discourses are based upon a biopolitical logic that 'makes live or lets die' according to human justifications of ecosystem diversity and notions of more-than-humans being in their 'proper place' (Philo and Wilbert 1994).

Whilst compelling, the theoretical discussions of more-than-human life have been criticized by some as lacking in political meaningfulness, or as being (so far) unable to identify how non-humans act as purposeful agents of/for change (Castree 2003; Srinivasan 2015). Humanly sanctioned rewilding efforts have often sought to reintroduce species that are intended to modify and improve ecosystem functioning for the benefit of humans. Von Essen and Allen (2016) make the case that while the autonomy of non-humans is championed in official practices of rewilding, this is inconsistent with their human-assigned task of engineering landscapes. In particular they suggest that in sanctioned rewilding initiatives, non-human autonomy is used as a human proxy for ‘fulfilling our [human] duty to restore nature’, and that under this guise the rhetoric and practice of rewilding are incompatible (ibid: 97). Von Essen and Allen argue that framing rewilded organisms as proxies and agents of humanity, ‘relegates rewilded animals to a sub-sovereign category’ (ibid. 83), while those animals that are autonomous with no regard to how they may act on humanity’s behalf are categorized as ‘wild sovereigns’ (ibid. 94).

Von Essen and Allen run the risk of entrenching the concept of non-human autonomy in binary thinking by creating a clear distinction between non-humans that are, or are not, perceived to be autonomous in rewilding practices. DeSilvey and Bartolini (2019) warn us against framing more-than-human autonomy in such a way, instead calling for a more nuanced and situated understanding of autonomy in rewilding practice. They note that depending on the spatial and political context, rewilding projects can enable different forms of non-human autonomy to emerge in relation to institutions of governance and power.

In the following sections of this paper, we build on DeSilvey and Bartolini’s argument, through an analysis of beaver rewilding in Scotland. We examine the autonomy of sanctioned beavers at the official trial site in the Knapdale Forest, exploring their governance through the

spatial practices of place-making and the management of beaver mobilities. We then investigate the autonomy of unsanctioned beavers living across the River Tay catchment to reveal the ways in which their non-human autonomy intersects with other forms of power.

3. METHODOLOGY

On the 28th and 29th May 2009, three families of Eurasian beavers (*Castor fiber*) totalling 11 animals, were released into three separate freshwater lochs within the Knapdale Forest situated in mid-Argyll on the west coast of Scotland. This was the first time these animals had appeared in the wild on the Scottish mainland since they were hunted to extinction by the 16th century (Campbell-Palmer et al. 2018). The release marked the beginning of the Scottish Beaver Trial, or SBT for short, a 5-year project ostensibly intended to assess the impacts of reintroducing beavers from an ecological, geomorphological, economic, and wider social perspective, run as a partnership between the Scottish Wildlife Trust (SWT) and the Royal Zoological Society of Scotland (RZSS). This was the first licensed release of a mammalian species to take place anywhere in the United Kingdom, so the outcome of the trial has significant implications for any future UK mammalian reintroduction efforts, including beavers in other parts of the country.ⁱⁱ

The SBT chimes with one of the most dominant forms of rewilding practice, which sees the reintroduction of wild mammalian species to their historic range (Jørgensen, 2015). Such reintroductions are often assumed to bring about pronounced changes to the composition and diversity of other species and ecosystem functions. This is especially so with those species designated as ‘ecosystem engineers’, such as beavers, which can have far-reaching landscape-level impacts on geomorphology, hydrology, and species diversity (Rosell et al. 2005).

There is, however, another story of beavers living in Scotland that runs parallel to the SBT. Before the SBT commenced, beavers were ‘unofficially’ reintroduced into the catchment of the River Tay, and later found their way into its tributaries located within the local authority areas of Dundee, Angus, and Perth and Kinross (henceforth called Tayside catchment). While it remains unconfirmed, this population is thought to have been established through being deliberately released, or as escapees from a small, privately-held, captive population (SWT interview, 2016). According to the Tayside Beaver Study Group (TBSG), ‘unlicensed’ beavers have been living in the Tayside catchment area since at least 2006 (TBSG, 2015), and have been increasing in numbers ever since. The most recent survey of the Tayside population conducted in 2017-2018 estimates 319-547 individuals, up from 106-187 in 2012 (Campbell-Palmer et al., 2018).

The first official application for a beaver reintroduction trial in Scotland was lodged in 2002, following years of preparatory work undertaken by Scottish Natural Heritage (SNH).ⁱⁱⁱ Submitted to the Scottish Government’s Deputy Minister for Environment and Rural Development, the application was denied in 2005 over concerns that a trial reintroduction might negatively impact Special Areas for Conservation at the proposed site in the Knapdale Forest in the Scottish Highlands. In 2007, the Scottish ‘Species Action Framework’ set out a strategic approach to species management for biodiversity in Scotland. This framework, along with a change in government, created an opportunity for the SWT and the RZSS to submit a second application for a beaver reintroduction trial, and in 2008, a licence to undertake a five-year scientifically monitored trial reintroduction of Eurasian beavers to Knapdale Forest was granted by the Scottish Government. The project’s key objective was to help provide an evidence base which could inform and guide the Scottish Government on any future policy regarding the reintroduction of beavers across Scotland.

Over the period of the trial a total of 16 beavers were released with the aim to establish a minimum of four breeding pairs. In addition, 14 beavers were born, creating a total of 30 released or wild-born beavers on the site at various points during the trial period. By the end of the trial in 2014, approximately 8 reintroduced beavers had survived and 1 or 2 ‘wild-born’ beavers were thought to be alive in the Knapdale area.

This paper draws on an analysis of qualitative research carried out in early 2016, including interviews conducted with individuals from the SWT, RZSS, SNH, Forest Enterprise Scotland (FES), the National Farmers Union of Scotland (NFUS), and other key actors implicated in the ‘debate’ over the future status of beavers in Scotland. We undertook a site visit to the SBT in the Knapdale Forest, to get a sense of the scale and the landscape qualities of the trial site, during which we also attempted to identify signs of beaver life and use of the site.

While initially we had intended to spend time in Scotland meeting with SBT stakeholders as a means to examine the official reintroduction of beavers to Knapdale, it quickly became apparent during our interviews that this wasn’t a story about one site but actually a tale of two different beaver ‘initiatives’. It was impossible to discuss the present and future lives of beavers in Scotland without discussing the ‘unlicensed’ beavers living across the Tayside catchment. These particular animals were shifting the debate (and, as we shall see, forms of power), about the legal status of beavers in Scotland. Unlike those in Knapdale, the Tayside beavers are more likely to cohabit landscapes with humans, which led to an increase in participants framing the issue as one of ‘conflicts’ between beavers and humans. Consequently, we spent much time discussing the Tayside beavers with stakeholders at Knapdale, as well as with individuals and organizations at Tayside, and those more broadly affected by the reintroduction of beavers in Scotland.

All interviews and field notes were transcribed and analysed with a focus on the (relative) autonomy afforded to beavers, and how they were exercising agency across both sites. In conjunction with this, we undertook a close reading of official policy documents relating to both the SBT and the Tayside beaver populations.

4. ARGUMENT

4.1 Managing beaver autonomy in the Knapdale Forest

The landscape of the Knapdale Forest is one of a mosaic of ‘knaps’ (rocky ridges) separated by ‘dales’ (small valleys), as well as a variety of sea and freshwater lochs. It is owned predominantly by FES, an agency of the Forestry Commission Scotland (FCS), with four small private properties found within the Trial area. It is primarily composed of native broadleaf woodland and 20th-century conifer plantations. However, the forest is undergoing gradual restoration to native woodland since 1985, following a Scottish review of broadleaf forest policy. Efforts to restore the site through the removal of conifers and the planting of native trees accelerated in 2000-2001 (FES interview 2016).^{iv} The SBT took place within a 44km² area within the forest, with boundaries set by the FCS.

When the beavers were reintroduced within the Knapdale Forest, the site was not enclosed by (human-made) physical barriers. Nonetheless, for the SBT scientific monitoring process to be deemed ‘successful’ and to avoid deleterious human-beaver interactions from occurring, it was considered necessary for the beavers to be spatially ‘contained’ within the site for the duration of the Trial. In what follows, we describe how this contradictory logic - which we call ‘managed autonomy’ - was operationalized during the Trial period at Knapdale.

Throughout our discussions with stakeholders, it was clear that Knapdale was chosen as the location for the SBT in part due to its perceived ecological qualities that were, we were told, ‘complementary’ to the beavers, as one stakeholder from the FES explained:

‘The trial told us that the beavers wouldn’t stray much more than about 20 metres from the water course, either being a burn or a loch. So most of Knapdale has a good 20 metres of native woodland associated with most of those water courses...Our general plan for the forest is complementary to beaver populations, anyway. It always was [due to ongoing native restoration efforts]...There would be other forests in Scotland where we wouldn’t do that [restoration], because there are other priorities and there are other emphasis on timber production, for example, of conifers and soft woods would be a higher priority than it would be in Knapdale.’

While the Knapdale landscape was posited as compatible with beavers from an ecological perspective, the introduction site was also identified as a relatively bounded unit where there would be less risk of human-wildlife conflicts developing than in other ecologically appropriate sites across Scotland. The chosen site at Knapdale was not heavily invested with timber production, salmon fishing, or agriculture. There was a presumed low risk of conflicts or deleterious impacts stemming directly from the agency of beavers, such as the modification of riparian landscapes and the alteration of floodplain dynamics through the felling of trees and the building of lodges, dams, and canals. In addition to this assumed complementary relationship between beavers and a less exploited wooded landscape, Knapdale was also chosen for the management of beaver mobility. ‘Natural containment’, provided largely by the topography of the site in the form of ‘knaps’ and

‘dales’, would ensure that beavers would be less likely to disperse beyond the delineated boundaries of the trial area. As noted by SBT stakeholders:

‘The landform and resultant hydrology, coupled with the distribution of forest and riparian habitats suitable for beavers, was thought to provide a degree of natural containment. The steep escarpment along the north boundary, the conifer plantations to the east and west, and the salt water lochs to the south and west were considered to be deterrents to beaver movements.’

(Jones and Campbell-Palmer, 2014: 29)^v

This strategic spatial decision was noted by other SBT stakeholders we spoke to during interviews, including the FCS:

‘I think they looked at a whole range of sites over Scotland that might be suitable for reintroduction of beavers. And they looked at a whole range of things, obviously the key one being to have a suitable bowl. So they were looking at geographical things in terms of containment and making sure that- because obviously they wanted to keep the population relatively contained.’

(FCS interview, 2016)

The landscape itself became a politicized unit, operationalized as a technique of security to guide (and limit) the mobilities of the beavers. Paradoxically, this spatial practice was utilized by the SWT in order to produce space within which non-human agency could be enacted. The beaver

population's ability to flourish at Knapdale was also constrained by the number of beavers reintroduced to the site, which affected their ability to develop a self-sustaining population, that is, a population that does not require human intervention to sustain it, which is a fundamental component of rewilding practice (Svenning et al. 2016):

‘What we’re talking about is a relatively small trial with a fairly small number of animals. And for the population in Knapdale to be sustainable long term, you’re going to need an awful lot more animals there to do that. But it was a starting point, that’s the thing. It was politically very difficult to get the trial off the ground in the first place and if you decided right, we’re going to start with 150 animals, just forget it. A small-scale trial, originally with 16 animals, then that was really the starting point. From there they’ve got to make a decision as to whether they’re going to add to that, whether they’re going to do nothing or what.’

(FCS interview, 2016)

The beavers reintroduced to the Knapdale Forest site were sourced from Norway, and efforts were made to capture and release whole family units, partly because this would “...potentially reduce any rapid dispersal out of the Trial area – a sensitive issue for some local stakeholders worried about ‘straying beavers’” (Jones and Campbell-Palmer, 2014: 17). It was thought that family units would be less likely to disperse across the landscape as compared to individual animals (RZSS interview, 2016).

All the practices of anatomo-politics and biopolitics intersected to produce ‘healthy’ subjects for release into Knapdale. The translocated beavers were kept for a one-month period under

quarantine in Norway, as required by the Norwegian Food and Safety Authority, and then a statutory six-month quarantine period when the beavers arrived in the UK, as required by the Department for Environment, Food and Rural Affairs (DEFRA). During this latter quarantine period, all beavers were screened for potential zoonotic diseases and rodent pathogens before being released (Jones and Campbell-Palmer, 2014: 22-23).

Natural containment and a low beaver population couldn't wholly ensure that beavers would not disperse beyond the boundaries of the trial site. Indeed, '...the actual extent of beaver dispersals was greater than anticipated, particularly because the Trial site was not as enclosed an area as was first presumed' (Jones and Campbell-Palmer, 2014: 55). As a means to address the potential dispersal of beavers from the site, a 'missing beaver protocol' was put in place at the start of the trial to recapture animals and return them to the 'bounded' confines of Knapdale. A combination of in-field visual observations of individuals, field signs (including signs of gnawed and stripped tree bark), and tagging methods were used.^{vi} These methods of beaver tracking were important in terms of providing basic scientific data on the spatial distribution and interactions of beavers within the landscape and help monitor the health and welfare of the beaver population. They also provided a means by which beaver movements could be tracked and individuals, if found to be outside the designated trial site, be captured and returned to the site.

Tracking technologies were important from a perspective of allaying public concerns over beaver mobility. They responded to the concerns of 'some local and national stakeholders who were worried about beavers moving out of the Trial area and potentially having detrimental impacts further afield' (Jones and Campbell-Palmer, 2014: 64). Other SBT stakeholders mentioned 'that [tagging] was one of the things that was used to reassure people that initially all these animals

were going to be under control, because there were tags on them so we'd be able to find them if they go anywhere and just bring them back' (FCS interview, 2016).

For a species that is known to disperse from a family group once an individual has reached approximately two years of age (Campbell-Palmer et al. 2016), this was a significant attempt to retard beaver mobility. However, because beavers moulted fur, gnawed through epoxy resin (which made tags non-waterproof), and groomed one another (which removed ear tags), the tagging procedure led to mixed results (FCS interview, 2016).

If field tracking methods failed to locate a 'missing' beaver within a period of one month, there would be an escalation of the protocol. This involved holding a stakeholder's forum, which included landowners and organizations such as the NFUS. The forum regularly informed about the potential whereabouts of the beaver(s), and requested landowners and the local press to report any 'suspected beaver activity' to the SBT field officer (Jones and Campbell-Palmer, 2014: 145). While the mobility of the beavers was managed through natural containment, tracking and re-capture efforts, any breach of the site boundary did not render such beavers 'killable'. Under the licensing agreement the beavers were legally protected from culling if they strayed beyond the boundaries of the Trial. The final SBT report noted that: '...since the Trial beavers were the property of the SBT partners, Strathclyde Police advised that any deliberate attempt to damage or destroy them could be argued in a court as being the offence of 'malicious mischief' under common law' (Jones and Campbell-Palmer, 2014: 12).

As a direct outcome of the licensing agreement, liability and property rights were key to governing the relationship between different institutions and local actors and the official licensed beavers and their autonomous actions. Beavers and their effects were allowed to 'be wild', that is to say, autonomous, only within the boundaries of the site. Motivated by a desire to secure a distinct

boundary between the reintroduced beavers and human (economic) space, the licensing agreement between the SBT partners (the SWT and the RZSS) and the Scottish Government was subject to 31 different conditions, covering both the management of the project and potential impacts of the beavers that breach the Trial boundaries. Condition number 18 stipulates the following:

‘Arrangements must be put in place by the trial applicants to ensure that local businesses and properties have a clear route to pursue compensation claims for damage caused by beavers during the period of the trial.’

(Jones and Campbell-Palmer, 2014: 10)

Consequently, the Trial developed compensatory procedures if landowners were affected by ‘stray’ licensed beavers. During the Trial, one cross-boundary conflict occurred. In 2009, a local landowner reported to SNH that 20 small- to medium-sized trees had been felled on their land, 3.5 km north of the Trial area. Upon inspection by SBT workers, beavers were observed in proximity to the property, so 100 replacement willow saplings were planted as a form of compensation. As an interesting aside, many of these felled trees subsequently regenerated, but the SBT were keen to quickly resolve any private property disputes that stemmed from beavers moving through landscapes located outside of the officially designated Trial area.

Tagging, trapping, and recapturing, alongside quarantine and extensive pre-release pathogen and health screening, were all attempts to manage and secure the beaver population at Knapdale. In particular these controls reflected strong concerns that the beavers could threaten public health, most notably regarding exposure to the intestinal parasite *Cryptosporidium*, which can be transmitted to humans through the consumption of contaminated drinking water. The licensing

application contained the provision that Argyll and Bute Council's Environmental Health Service be identified as the public health partner to ensure regular monitoring of the trial area as part of a regime of public health control. In the case of beavers these practices had different logics: firstly, to ensure the health of the beavers, but, perhaps more importantly, to secure the health of human populations, as well as to secure the economic landscape.

The stated purpose of the Knapdale trial was to measure and analyse the 'impacts' of a wild beaver population from an ecological and social perspective in order to contribute evidence to the Scottish Government to inform the future designation of the species in Scotland. However, this affordance was attenuated by the application of biopolitical control, through both visible and invisible forms of boundary maintenance that were deemed crucial to the 'success' of the trial and were a stipulated requirement of the licencing agreement. This attenuated affordance, or managed autonomy, was understood as a paradox by some SBT stakeholders. For example, a representative from the FCS we interviewed spoke about their frustration regarding discussions amongst stakeholders as to whether a beaver dam built on one of the lochs within the Trial boundary - Dubh Loch (see Figures 1 and 2) - should be removed or not, given the potential impacts that the dam could have had on the ecology of the loch, which is a component of the area's designation as a Site of Special Scientific Interest (SSSI):

'But in terms of their behaviour on the site, we weren't sure where they would choose to go. The Dubh Loch, which is where you walked around, that was the first place. Because those animals were actually released in the larger loch at the bottom...they didn't use that. They basically swam around the loch and they found the Dubh Loch, which we thought they would maybe use for some feeding. But

they went straight there, they started to dig canals, which beavers do, that's no big surprise, but that was the first thing they did. It was actually quite impressive how much they managed to create in a relatively short period of time. They dug canals, so they could get access from the Dubh Loch to the main loch and the way they built the dam, they started building the dam and there were some questions. Because of the status of the SSSI that they were in, there were issues in terms of should they be able to build dams? And I thought actually it makes us look pretty stupid. We put them there, beavers build dams and the first time they actually do what beavers do, we're deciding to try and stop them from doing it. It's just ridiculous...So there was a question about whether we should remove the dams. But anyway, we didn't.'

(FCS interview, 2016)

This also presents a clear example of how the relative autonomy of a reintroduced ecosystem engineer - a target species for rewilding initiatives - may conflict with, and challenge, existing modes of environmental conservation ontologies and practices that presume temporal and spatial stability.



Figure 1: Dubh Loch



Figure 2: Dubh Loch beaver dam

Given the range and depth of control measures put in place during the Trial, we may ask whether this bears any relation to how future beaver reintroductions may unfold in Scotland, or whether the characteristics of the Trial site can be generalized to other locations across the country. Indeed, the majority of the stakeholders we interviewed were of the view that the Trial site was not representative of potential future reintroduction sites. Some pointed out that the straightforward and uncontentious land ownership and land uses, and the relatively ‘closed’ landscape of knaps and dales, would not be easily found elsewhere. One stakeholder asserted that they ‘don’t think they would have got [the Trial] approved anywhere else where it would have potentially had more of an impact on farming activity and cultural land’ (NFUS representative for Argyll and Bute interview, 2016). There were ongoing discussions amongst the SBT stakeholders regarding

running a second trial release within an ‘open’ river system as a means to test the ecological, but more importantly the social, ramifications of reintroducing beavers within a more ‘typical’ river system. A representative of the RZSS told us:

‘If you really wanted to test it you probably would have put it in somewhere like the Tay because you've then got fishery issues, you've got farming issues, you've got all of these things that it's going to challenge and you can test it, but in terms of creeping the idea in, you might want to put it on a less controversial river.’

(RZSS interview, 2016)

It is not clear exactly why this second trial release was not undertaken. In the meantime, however, the beaver population in the Tayside catchment was starting to eclipse the Knapdale population in media and popular discussions in Scotland. The Head of Policy for NFUS told us that in his view, the events at Tayside rather than Knapdale would influence the decision on the future of beavers in Scotland:

‘I have sympathy for Scottish Wildlife Trust and beavers in Argyll. It was the sanctioned, official way to do it. But in a way, maybe ‘irrelevant’ is too strong a term, but they have been overtaken by events and now I don’t believe when the Minister is making the decision that she will have Knapdale in mind. You can’t. I mean, you’ve got hundreds in Tayside spreading pretty rapidly in that area and you’ve got ten left in Knapdale.’

4.2 Beaver autonomy and sovereign control on the Tayside catchment

In 2006, SNH became aware of a population of beavers living across a broad section of the Tayside catchment and the River Earn. This area spans from Perthshire and Angus near Dundee, and spreads across the Grampian Mountains. From this year onward, there was a rapid expansion of both the range inhabited by beavers and their population numbers. It was estimated that the population had grown to between 319 and 547 during a survey conducted across 2017 and 2018, up from between 106 and 187 in 2012 (TBSG 2015). None of these escapees or introduced animals were subject to official licenses and were therefore in breach of UK wildlife legislation and international conservation guidelines, rendering them ‘illegally’ released beavers.

Under pressure from the NFUS and local landowners, the Scottish government ordered SNH to instigate a regime of trapping and relocating wild beavers to zoos premised on a number of arguments, in particular relating to disease risk. However, after a short and unsuccessful period of trapping, the new Minister for Environment and Climate Change, Stewart Stevenson, opted to suspend this trapping regime, on the basis that the status of the unlicensed beavers would be reviewed in 2015 once the final report from the official SBT had been submitted to the Scottish Government. While not endorsing the ‘illegal’ release of beavers, this decision was framed as one of ‘tolerance’ of their presence (TBSG, 2015: 6).

Following this, the Tayside Beaver Study Group (TBSG) was formed in 2012 by SNH and a variety of partners including the NFUS, the RZSS, SNH, SWT, the Scottish Environmental Protection Agency, the Scottish Government, Scottish Land & Estates, the Scottish Wild Beaver Group, the Tay District Salmon Fisheries Board, and the Confederation of Forest Industries. The aim of the TBSG was to study and monitor the beavers and their impacts on the Tayside catchment, wildlife, and associated land. So, twelve years after the purported illegal release of beavers within

the Tayside area and significant expansion of their range and population, they began to receive scientific attention.

The presence of beavers in the Tayside catchment stood in sharp contrast to that of the beavers in the more ‘contained’ Knapdale site. The River Tay catchment encompasses some of the most productive agricultural land in Scotland, as well as being internationally recognized for its Atlantic salmon fishing. The Tayside beavers inhabited what was often termed in our interviews as a ‘human-influenced landscape’. Yet, in spite of this, they flourished. As one local NFUS representative put it:

‘In Tayside, obviously the impacts are quite different: you’ve got a different habitat, you’ve got different farming enterprises; a lot more arable ground, a lot more intensive ground. They’ve [beavers] travelled up the waterways, they’ve been able to move out. Whereas at Knapdale they haven’t really been successful. And they haven’t successfully bred, whereas they successfully bred in Tayside.’

During interviews, the success of Tayside beavers was partially attributed to their ability to be freely mobile. Unlike the Knapdale beavers, the Tayside beavers were not ‘naturally contained’ by knaps and dales, nor restricted by trial boundaries which, if transgressed, would require them to be captured and returned to a licensed area of land. In contrast, the Tayside beavers were unrestricted in their movements through waterscapes, and, as the NFUS representative put it, to ‘move out’. The Tayside population was also deemed more ‘successful’ by a number of our interviewees, based on their ability to breed and rapidly expand their numbers, leading them to be deemed a self-sustaining population.

There was anger from some quarters that ‘illegal’ beavers had been allowed to flourish without intervention from SNH, the body responsible for dealing with unlicensed reintroductions in Scotland. For example, the Head of Policy at NFUS told us:

‘Our position is that, you know, we don’t support reintroduction, therefore, by implication, we would wish to see the population in Tayside removed. I don’t think we have an axe to grind against beavers. You know, there’s not some sort of rabid hatred of beavers just because they’re beavers. For us, if you let a species like that be illegally re-established, flouting every rule in the book, every good practice guide, you don’t have a plan for how you’re going to manage them, you don’t have the finances to finance any plan, you’re struggling to meet your existing biodiversity commitments across the board, you have them in an area where they’re having a huge impact and there’s a potential to have a bigger impact, then that for us isn’t exactly a recipe for success.’

The unsanctioned ‘wildness’ or unmanaged autonomy of the Tayside beavers, i.e., their ability to move, breed and socialize with a reasonable degree of self-determination, put them at risk of forms of sovereign control. Whereas the managed autonomy at Knapdale offered sanctioned beavers legal protection against culling, the Tayside beavers were seen as illegal intruders. Although *Castor fiber* is listed in Annex IV (and Annex II) of the EC Habitats Directive, and in 2007 was included on the SAF list as a priority species for conservation, Section 14 of the Wildlife and Countryside Act 1981 makes it an offence to release into the wild any animal that is of a kind ‘*not ordinarily resident*’ in the United Kingdom. Without an official reintroduction licence, the Tayside

beavers were not afforded the same legal protection as the Knapdale beavers and were certainly not considered to be ‘ordinary residents’ of Scotland. Legally, the Tayside beavers were both ‘out of place’ and ‘outlaws’. Unlike the Knapdale beavers who were afforded an ethical and political status through the licensing agreement within demarcated boundaries, the Tayside beavers’ political status was one of invasion and trespass.

This political status increased the risk of beavers being exposed to the most violent form of control when seen to challenge the safety of economic life: culling. As the Tayside beavers were unlicensed, they had no legal protection and therefore shooting of the animals, though discouraged by SNH and the TBSG, was legal. Indeed, there were reports in national newspapers that beavers living within the Tayside catchment were being shot and killed (Ross 2015; Carrell, 2018). Even those supporting and directly involved in the SBT project were sympathetic to lethal control, with a representative from RZSS explaining to us:

‘I absolutely understand their annoyance at the situation they find themselves in. They have got no choice [but to cull beavers], well, they have at the moment, and many people are taking the management of beavers on their land into their own hands, but, yes, what they would say, "What options are we left with?"’

Throughout the first half of the paper we discussed the considerations that went into the biopolitical regulation of beaver lives at Knapdale in order to generate a ‘successful’ trial, one that would inform the Scottish Government on the legitimacy of reintroducing beavers into the wider environment. Yet, it was the Tayside beavers and their autonomous activities that became the focal subject of conversations on farms and exercised a decisive influence in policy circles. On the 24th

of November 2016, the Scottish Government announced the designation of Eurasian beavers as a Protected Species under the European Union's Habitats Directive, and that beaver populations in both Knapdale and Tayside would be allowed to live under this formal legal protection.^{vii} According to our interviewees, the Tayside beavers' agency was essential, not incidental, to the political process that lay behind the making of this decision. As the SBT Trial Manager from the SWT explained to us:

‘In retrospect, I look back at it and say it [Tayside beavers] was a good thing as it's moved the whole agenda thing on. We wouldn't be in a position now with the government having to decide what they're really going to do about beavers unless we had 200, 300 beavers from Tayside, because we've probably only got about between 8, 10, 12 left in Knapdale. I don't know at the minute. So it would have been oh, that was very interesting, thank you very much, problem sorts itself. We've now got a live and thriving population of animals on Tayside. So I think the history books will probably look back at it and say it moved the debate on.... Tayside is forcing the issue because you've got way more animals who are having way bigger impact on a much more intensive landscape. Actually, that's the nuts and bolts. That's the reality of living with a big beaver population’.

Our empirical findings point to the ways in which the Tayside beavers' ability to thrive, ultimately shaped debates about the future of beavers in Scotland, and consequently secured the legal protection of their species. We argue, then, that the beavers of Tayside have, in part, become agents of their own successful rewilding story by actively shaping and guiding legislature, due to the

higher degree of agency afforded to them compared with their managed counterparts in Knapdale. The Tayside beavers are not wild animals produced within a logic of conservation, but rather the consequence of intentional or unintentional releases, whose subsequent abundance in the landscape influenced policy discussions about the future legality of their species. While we do not argue that the Tayside beavers *intentionally* challenged the institutional processes involved in policy-making or are political subjects in the traditional sense of the word, it is clear that they played an active role in forcing the policy process to designate their species as ‘native’ and therefore ‘legal’. In this sense, as more-than-human outlaws, they adapted, resisted, and challenged existing spatial power relations through their unmanaged autonomy, and by doing so created new possibilities for the individual and collective life(s) of their species.

5.0 CONCLUSION

Our empirical study of rewilding of beavers in Scotland shows how non-human autonomy coalesces in distinct ways with institutions of governance and forms of power depending on the socio-political context and locational characteristics. While the Knapdale beaver population were afforded a certain degree of autonomy within a licensed (and hence legal) reintroduction programme, this was attenuated by the application of significant biopolitical control. The licensing agreement invoked property rights as key to governing ‘wild’ beaver bodies, wherein techniques of care and harm were operationalized across demarcated boundaries to ensure the ‘success’ of the trial. The busy beavers at Tayside, being unlicensed and outside the politics of property rights, were outlaws that attracted the bulk of attention. Their illegal status afforded them relatively unrestrained autonomy, but also rendered them ‘non-native’ and subject to violent sovereign forms of control that legitimized their killing.

The story of beaver rewilding in Scotland demonstrates that autonomy is situated and variable, and that attention must be paid to understanding the ways in which autonomy is ‘allowed-for’ in rewilding practice, both within conservation and legal processes of decision-making. Von Essen and Allen (2016: 89) note:

‘The issue with rewilding out of bounds is a paradox: lack of planned human intentionality can deprive a species of the right to exist in an area even if the animals established themselves autonomously at a site. At the same time, meticulously planned rewilding schemes where species are paternalistically placed and maintained at another location, attain more legitimacy with what appears to be *less* of the sovereignty and wildness sounded in its rhetoric.’

While at first glance the story of the Knapdale and Tayside beavers corresponds to this conceptualization of sovereignty, our study complicates the clear mapping of autonomy onto so-called ‘wild sovereigns’. It also unsettles the claim that a lack of human intentionality can deprive rewilded animals of the right to exist, or that official and meticulously planned rewilding projects attain more legitimacy. While the Tayside beavers were deemed an illicit transgression (and therefore eliminated by some stakeholders), the autonomy of these unlicensed animals created the context for a fuller expression of ‘wild’ beaver agency as compared to the Knapdale population. Through their autonomous activity as local outlaws, the Tayside beavers disturbed the normative politics of belonging. They challenged the binary categorisation of native/non-native and were fundamental to the designation of beavers as a protected species in Scotland.

To be clear, we are not advocating for unlicensed introductions as a form of rewilding. What we wish to emphasise, however, is that the future challenge for rewilding is to understand how varying types and degrees of more-than-human autonomy are negotiated within multi-species shared spaces. In particular, rewilding efforts will need to recognize that terms such as ‘wildness’ and non-human ‘autonomy’ do not imply absence of human interaction or intervention; instead, they exist in a state of ‘relation’ (Collard and Dempsey 2015). This means that rewilding, whether passive or active, is not about *stepping back* from non-human nature, but is about *stepping alongside* with more-than-human nature. It requires negotiation of legal protections, mitigation efforts, and variable forms of ‘managed’ and ‘unmanaged’ autonomy’ as legitimate and responsible ways of living in a more-than-human world.

6. EPILOGUE

The 1st of May 2019 marked the legal protection of beavers in Scotland, under the European Union’s Habitats Directive. At the time of submitting this paper, a Management Framework for Beavers in Scotland was being published, which outlines official policy and practical guidelines for the management of beavers as a protected species in Scotland.^{viii} In particular, the framework sets out a mitigation scheme, as well as direct management strategies. Direct management will include the use of lethal control under licence. It is clear, then, that beavers and humans are bound together in an ongoing biopolitical struggle over life.

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ⁱ It is important to note that ‘direct human intervention’ does not equate to species and environments not being influenced by human activities. A migratory bird species may not be directly managed in terms of its movements, but its migratory patterns may still be influenced by, for example, habitat loss resulting from human activities.

ⁱⁱ It should be noted at this juncture that, following in the footsteps of the SBT, there have been licenced beaver reintroductions in England (most notably on the River Otter and in the Forest of Dean), and there are ongoing plans for a licenced trial reintroduction in Wales (see <https://www.welshbeaverproject.org/home/>).

ⁱⁱⁱ Scottish National Heritage is a non-departmental public body of the Scottish Government that advises the Government on issues pertaining to Scotland's natural heritage; the organization also undertakes research and manages natural heritage designations across the country.

^{iv} The FCS was a non-ministerial government department of the Scottish Government that managed publicly owned forests and woodlands, undertook research on forestry practices, and set and implement forestry regulations. In 2019, it was dissolved and replaced by two new agencies, Forestry and Land Scotland, and Scottish Forestry.

^v *Castor fiber* is a freshwater species, and so tends to avoid salt water lochs.

^{vi} Different tagging methods were used for both released and 'wild' born individual beavers captured during the trial period, including ear tags, telemetry tags, which can be detected in the field through the emission of radio frequencies or a signal that is detected by a low earth-orbiting satellite, and GPS tags, from which data can be downloaded and viewed when an individual is re-captured. Each individual beaver was also microchipped with a Passive Integrated Transponder (PIT) tag, which can be read by a PIT reader; this would allow for the identification of animals, even if all other tags were lost.

^{vii} It should be noted that the interviews in this paper were conducted five months before this decision was taken.

^{viii} See: <https://www.nature.scot/professional-advice/safeguarding-protected-areas-and-species/protected-species/protected-species-z-guide/protected-species-beaver/management>