

1 **Killing squirrels: exploring motivations and practices of lethal wildlife**  
2 **management**

3

4 **Abstract**

5 Wildlife management, pest control and conservation projects often involve killing  
6 nonhuman animals. In the United Kingdom, introduced grey squirrels *Sciurus*  
7 *carolinensis* are killed in large numbers to protect remnant populations of European  
8 red squirrels *Sciurus vulgaris*. Grey squirrels are also killed outside of red squirrel  
9 areas to protect broadleaved trees from squirrel damage, and as part of routine pest  
10 control, opportunistically, and sometimes recreationally. In order to investigate the  
11 ways in which this killing is conceived and practised in the UK, we conducted semi-  
12 structured interviews with practitioners and undertook participant observation of  
13 squirrel management activities, including lethal control. Analysing these field data,  
14 we identified important variations in practitioners' approaches to killing squirrels, and  
15 here we outline three 'modes of killing' – reparative/sacrificial, stewardship, and  
16 categorical – which comprise different primary motivations, moral principles, ultimate  
17 aims, and practical methods. We explore both productive alliances and possible  
18 tensions between these modes, and propose that clear, explicit consideration of how  
19 and why animals are both killed and 'made killable' should be a key component of  
20 any wildlife management initiative that involves lethal control.

21

22

## 23 **Introduction**

24 There's more than one way to kill a squirrel. In the United Kingdom (UK), people  
25 bring about the deaths of thousands of grey squirrels *Sciurus carolinensis* every  
26 year: in houses, gardens, barns and woodlands; on public and private land; and with  
27 guns, traps, weighted priests, and water. Killing is an occasional pot-shot from the  
28 window, or a full-time occupation; it is distressingly difficult and/or a matter of routine.

29

30 The killing of nonhuman animals (hereafter 'animals') is ubiquitous in human  
31 societies (The Animal Studies Group, 2006), and "fundamental to the creation of the  
32 social order between sets of creatures" (Marvin, 2006, p20). Nevertheless, despite  
33 an abundance of theoretical and philosophical discussions of the ethics of killing,  
34 comparatively little empirical social scientific research has examined how nonhuman  
35 killing is practised and performed. Exceptions include work in the 'domestic killing'  
36 spaces of slaughterhouses, research laboratories and animal shelters, where people  
37 who routinely kill animals face a range of psychological and emotional challenges  
38 (Dillard, 2008; King, 2016), and anthropological research investigating hunting  
39 practices amongst 'Western' and indigenous peoples, which indicates that 'wild  
40 killing' can be experienced as positive and/or rewarding (Cartmill, 1993; Ingold,  
41 2000; Knight, 2012; Marvin, 2010; Watson and Huntington, 2008). More recently,  
42 there has been increasing academic interest in how killing and death "circulate  
43 alongside care and life" (Ginn et al., 2014, p113), addressing the 'violent-care' of  
44 killing in conservation (Clark, 2015; van Dooren, 2015), rescue shelters (Reeve and  
45 Rogelberg, 2005) and veterinary practices (Law, 2010). Practitioners working in  
46 these domains can find killing 'genuinely difficult' (Atchison et al., 2017; van Dooren,  
47 2011), and experience moral stress, or "a sense of discord and tension" (Rollin,  
48 1987, p119) between their reasons for acting (care) and their actions (taking life).  
49 Scholars have also, therefore, begun to examine the potential significance of  
50 detachments and 'non-relation' between killer and killed (Ginn, 2014).

51

52 Haraway (2008) argues that living 'outside killing' is effectively impossible, and  
53 proposes that it is not killing *per se* that is fundamentally problematic, but making  
54 others – animals or humans – 'killable'. She cautiously suggests that, to avoid the  
55 'exterminism' associated with 'making killable', people might aim to stay "in the  
56 presence of" (2008, p83) those they kill, and take responsibility for killing. Here, we

57 aim to contribute to this emergent body of literature that does not seek either to  
58 condemn nor to defend nonhuman killing. Rather, we aim to problematize killing, and  
59 take it seriously as an inescapable and consequential form of human-animal  
60 interaction, but have avoided making general judgements about its appropriateness  
61 or morality. In taking this seemingly detached approach, we are not claiming  
62 objectivity, or that our writing and observation of killing practices is innocent. We  
63 could arguably have taken a more critical or normative stance on the ethical  
64 implications of killing squirrels. However, here we aimed to share and interpret  
65 practitioners' own understandings of their motivations and activities without  
66 judgement. We therefore sought to treat divergent and sometimes conflicting  
67 approaches symmetrically, irrespective of their alignment with our personal  
68 appraisals or moral positions. Similarly, as grey squirrels, here, are the subjects of  
69 immediate human violence, an argument could be made for more explicit  
70 examination of their experiences and potential suffering. However, grey squirrels are  
71 not the only nonhuman subjects in this story, and to include detailed consideration of  
72 grey squirrels' experiences while excluding those of red squirrels afflicted with SQPV  
73 (see below), or trees diseased or dying from de-barking, would also be  
74 asymmetrical. Nevertheless, we do not ignore these troubling processes; in  
75 describing some practices in detail we trouble the 'clean' versions of killing presented  
76 in institutional and public discourses, and we show that even where killing is  
77 commonplace, it is rarely completely normalised.

78

79 We are also interested in the distinction between killing and 'making killable' in both  
80 the specific context of squirrel management and wildlife management more broadly,  
81 and this work therefore also speaks to a growing literature that examines the  
82 governance of wildlife, including introduced species, though the Foucauldian lenses  
83 of 'biopolitics' and/or 'biopower' (Biermann and Mansfield, 2014; Collard, 2012;  
84 Fredriksen, 2017; Lorimer and Dreissen, 2013; Srinivasan, 2014; Srinivasan and  
85 Kasturirangan, 2017). The broad tenets of contemporary grey squirrel control could  
86 readily be identified and explored as human (though not necessarily state) efforts to  
87 assert power and control over life: grey squirrels are regularly 'made to die' in order  
88 for red squirrels and trees to live (see Hodgetts, 2017; Srinivasan and Kasturirangan,  
89 2017). However, as we move beyond the generality of government and institutional  
90 strategies, and into the intricacies of practice – the nuanced and contested ways that

91 killing is *done* – we find that ‘killing to make live’ is a heterogeneous activity. Killing  
92 squirrels is certainly biopolitical, but here we approach biopolitics not only as a  
93 philosophy or strategy of governance, but also and perhaps more tellingly as the  
94 relations between a complex collective of things: humans, nonhumans, ideas, words,  
95 practices, and so on (hence our development of multiple ‘modes’ – see below). We  
96 are therefore engaging with a version of biopolitics that conceives of governance as  
97 “arranging things so that this or that end may be achieved through a certain number  
98 of means” (Foucault, 2007: 99), rather than focusing on governance as a means of  
99 disciplining, repressing or otherwise manipulating life (see Lemke, 2015; Asdal et al.,  
100 2017).

101  
102 Killing wildlife is often, and perhaps increasingly, controversial (McLeod, 2007;  
103 Meurk, 2015), and the evaluation of ‘public’ and ‘stakeholder’ attitudes towards lethal  
104 control has become an increasingly important component of research investigating  
105 the ‘human dimensions’ of wildlife management (e.g. Dandy et al., 2012; Enticott,  
106 2015; Farnworth et al., 2014; Lute and Attari, 2016; Sharp et al., 2011). In  
107 comparison to these broader ‘communities of interest’ (Patterson et al., 2003),  
108 relatively few people, in the UK at least, comprise the ‘communities of practice’  
109 (Everts, 2015; Lave and Wenger, 1991) that kill or bring about the death of wild  
110 vertebrates, and less academic research has focused on the views and experiences  
111 of these diffuse, diverse communities (Boonman-Berson et al., 2014). Our research  
112 therefore aimed to directly engage with a range of people involved in managing  
113 introduced grey squirrels in the UK (including professionals, volunteers and private  
114 individuals), to better understand their aims and motivations, and to explore how  
115 these are translated into practices. Here, we explore some of the complexities and  
116 considerations of wildlife management ‘in practice’, focusing on killing as a central  
117 component of contemporary squirrel management. We identify patterns and  
118 variations in how practitioners rationalise, perform, and respond to killing, which we  
119 group into ‘modes of killing’, or ways in which our participants approached,  
120 performed (or brought about), and responded to killing.

121  
122 Our use of ‘mode’ draws on Law’s (1994) ‘modes of ordering’, “in which talk, actions  
123 and materials are continuously organised” (Wilkinson 2011, p963), often through  
124 narratives “of what used to be, or what ought to happen” (Law, 1994: p20) but also

125 through continuous performance and material effects. Our 'modes of killing' share  
126 important features with Law's modes of ordering: there is often more than one mode  
127 at work in any given setting; they relate to, sometimes rely on, and sometimes  
128 conflict with one another; and they are not rational orderings imposed from without,  
129 but products of people's attempts to understand, live with and (often) control messy  
130 realities (Hinchliffe, 2007). The modes we describe are associated with, but not  
131 restricted to, different 'arenas' of squirrel management: conservation of red squirrels  
132 *Sciurus vulgaris*; tree protection; and routine or ad-hoc control of 'undesirable'  
133 animals (here referred to as vermin control). These arenas identifiably vary in their  
134 social and structural organisation, the methods they adopt, and their ultimate aims.  
135 The term 'arenas' is also associated with sites of conflict and performance, and  
136 therefore also highlights that squirrel control is not only a concept or strategy, but  
137 also something physically practised in specific places. These arenas produce, are  
138 produced by, and are associated with different ways in which people attempt to  
139 order, or make sense of, the world, in all its messiness and with all the necessary  
140 imperfections; and here, particularly, the 'natural' world and the place and role of  
141 squirrels, trees and people within it.

142

143 We begin with a brief introduction to squirrels and their management in the UK.  
144 Following a summary of our methods and analytic approach, we draw on our  
145 empirical work to outline three different 'modes of killing', their implications for the  
146 future of grey squirrel management, and areas of tension and accord between them.  
147 We conclude by highlighting the complex relations between 'killing' and 'making  
148 killable', and discuss how a detailed understanding of different modes of killing, and  
149 how they interact, might contribute to the development of effective, socially legitimate  
150 and sustainable wildlife management policies and projects.

151

## 152 **Background: squirrels in the United Kingdom**

153 There are two species of squirrel in the UK: the Eurasian red squirrel and the  
154 Eastern grey squirrel. The 'natural' history of red squirrels in the UK, prior to the  
155 1930s, is "somewhat perplexing and difficult to unravel" (Lloyd, 1983, p69). Although  
156 populations declined significantly nationwide in the 18<sup>th</sup> century, reforestation and  
157 reintroductions enabled something of a resurgence, and by the late 19<sup>th</sup> century red  
158 squirrels had become so abundant that intensive efforts were made to reduce their

159 numbers (Holmes 2015). By the early 20<sup>th</sup> century they were in decline once again,  
160 affected by disease, deforestation and competition with grey squirrels (Coates,  
161 2015).

162  
163 Introduced from North America over a hundred years ago, the socio-ecological place  
164 of grey squirrels in the UK remains contested (Coates, 2015). Despite efforts to  
165 control their spread and numbers, grey squirrels are now established across most of  
166 Great Britain and Northern Ireland (Mayle and Broome, 2013). They have become a  
167 visible and popular visitor to many urban-suburban parks and gardens (Bonnington  
168 et al. 2014), but also pose significant challenges for both red squirrel conservation  
169 and arboriculture. As grey squirrels spread during the 20<sup>th</sup> century, red squirrel  
170 populations continued to decline (Mayle and Broome, 2013). Current scientific  
171 understanding is that this supplanting of one species by another is primarily the  
172 result of disease-mediated competition (White et al., 2014). Direct resource  
173 competition with grey squirrels adversely affects red squirrel fitness and recruitment  
174 (Gurnell et al., 2004; Wauters et al., 2002) but grey squirrels can also carry  
175 squirrelpox virus (SQPV), which causes high mortality in red squirrel populations  
176 while hardly affecting grey squirrels (Chantrey et al., 2014; Tompkins et al., 2002).  
177 Strategic controls have helped red squirrels persist in designated 'strongholds'  
178 (Shuttleworth et al., 2015; White et al., 2014), however, most of the red squirrel  
179 population in mainland Great Britain is now restricted to Scotland, and a 'front-line'  
180 against grey squirrel expansion has been established along the Scottish borders  
181 (Tonkin et al., 2016).

182  
183 Grey squirrels damage growing trees by bark stripping, primarily in late spring and  
184 summer (Mayle and Broome, 2013). Multiple hypotheses have been advanced to  
185 explain this behaviour (see Nichols et al., 2016), but it remains poorly understood  
186 and continues to frustrate woodland owners and managers (Forestry Commission  
187 (England), 2014; Royal Forestry Society, 2014). Indeed, the issue has become more  
188 pronounced as native broadleaved woodlands, extensively planted with the  
189 assistance of generous grant aid in the 1990s, reach the most vulnerable age for  
190 squirrel damage (10-40 years: Mayle and Broome, 2013). Publicly-owned woodlands  
191 are still largely comprised of less vulnerable non-native conifers (85% of the area of  
192 the public forest estate cf. 38% in private woodland: Forestry Commission, 2016),

193 and the Forestry Commission (England) concentrates its grey squirrel control in red  
194 squirrel areas and highly vulnerable forestry plantations. In private woodlands, grey  
195 squirrels are subject to variable degrees and methods of control. Poisoning with the  
196 anticoagulant rodenticide warfarin was a popular control method from its introduction  
197 in 1973 to its effective banning (for outdoor use) in mid-2015 (Commission  
198 Regulation (EU) No 186/2014). Remaining legal control methods include shooting  
199 and trapping, using both kill- and live-capture traps. In some areas, however, rather  
200 than invest in costly management, woodland managers have simply stopped planting  
201 vulnerable broadleaves. Grey squirrels are also regularly killed during routine and/or  
202 reactive pest control on farms, around pens for rearing and releasing pheasants  
203 *Phasianus colchicus* for shooting, and in houses and gardens, where they create  
204 (what some see as) nuisance by digging bulbs, denning in attics, and disturbing birds  
205 (Bonnington et al., 2014). Drey-poking (where shooting parties use poles to coax  
206 young and adult squirrels from their arboreal dens, known as dreys) and free-  
207 shooting are both used to supplement other methods (Royal Forestry Society, 2014).  
208 Finally, a relatively minor amount of recreational killing also takes place. In parts of  
209 North America, this is a traditional, if declining, pursuit (Beardon et al., 2002). In  
210 Britain, while red squirrels were historically hunted for their pelts and 'squirrel clubs'  
211 that targeted red and then grey squirrels enjoyed some popularity in the 1900s and  
212 1940s (Holmes, 2015; Sheail, 1999), there is no strong tradition of recreational  
213 squirrel hunting (compared with, for example, fox and deer hunting, or game-bird  
214 shooting). We revisit the potential growth of this form of killing later in the paper.

215

216 Grey squirrel management has become something of a cyclical issue in British  
217 political discourse: Sheail (1999) concluded that ever since grey squirrels started to  
218 spread, consistent pressure from concerned lobbyists has prompted intermittent  
219 government efforts to address the problem, or at least to "be seen [to be]  
220 responding" (p145). This trend has continued since Sheail's analysis. Squirrels  
221 appear in parliamentary questions and debates almost annually, and national and  
222 regional governments are involved, to varying degrees, in grey squirrel control  
223 initiatives (primarily focused on red squirrel conservation, although grants for squirrel  
224 control in vulnerable woodlands are available as part of 'Countryside Stewardship'  
225 schemes). As of 2017, Government policy for grey squirrel management in England  
226 focuses on providing funding and support for research and coordinated control

227 programmes (Forestry Commission (England) and Defra, 2014). The devolved  
228 Welsh, Scottish and Northern Irish governments also support targeted grey squirrel  
229 control projects in red squirrel areas (Northern Ireland Squirrel Forum, 2016; Scottish  
230 Squirrel Group, 2015; Wales Squirrel Forum, 2009). In 2014, concerned parties  
231 additionally established the UK Squirrel Accord (<http://squirrelaccord.uk/>), a formal  
232 manifestation of contemporary efforts to unite the two primary drivers of grey squirrel  
233 control (forestry and red squirrel conservation) by co-ordinating the efforts of its  
234 signatories, which include government bodies, conservation organisations, forestry  
235 organisations and pest controllers. The issue features regularly in the news media,  
236 often associated with the launch of new grey squirrel control and/or red squirrel  
237 conservation initiatives. Nevertheless, at present grey squirrel management  
238 maintains a relatively low public profile, unlike other wildlife management problems in  
239 the UK that have been dominated by fraught, high-profile, chronic public debates  
240 (e.g. surrounding culling badgers *Meles meles*, hunting foxes *Vulpes vulpes*, and  
241 persecuting raptors).

242

## 243 **Methods**

### 244 *i. Case regions and participants*

245 This multi-sited case study focused on four regions: three with established red  
246 squirrel conservation projects including grey squirrel control (Scotland, Wales, and  
247 northwest England), and one where red squirrels are currently absent, and control is  
248 primarily conducted for woodland protection (southwest England). We sought a  
249 diversity of management strategies and contexts in our selection of regions<sup>1</sup> and,  
250 where possible, a range of backgrounds, motivations, aims and experiences  
251 amongst participants within each region. There were 50 participants in total (30  
252 male, 20 female; see Table 1 for spread of locations and primary role in relation to  
253 grey squirrel control). Conservation project officers were contacted directly and  
254 assisted with recruitment of project volunteers and wildlife management  
255 professionals. Forestry professionals and woodland owners were recruited with the  
256 assistance of Confor UK (Confederation of Forest Industries). All participants

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<sup>1</sup> There was also an element of self-selection, as we sent research invitations to multiple conservation projects and organisations with an interest in grey squirrel management, and only worked with those that expressed an interest in participating.



257 provided written consent and were supplied with information about the research.  
 258 Here, participants' identities are protected with pseudonyms.  
 259

**Table 1.** Research participants categorised by primary relationship to grey squirrel control and location.

Region	Forestry professionals	Wildlife management professionals	Woodland Owners	Administrative Officers (e.g. for projects)	Volunteers by Type*					Total
					1	2	3	4	5	
SW England	5	2	2	1	-	-	-	-	-	10
NW England	-	2	-	1	6	-	-	3	-	12
Wales	-	2	-	1	1	-	3	1	3	11
Scotland	-	3	-	4	5	3	1	1	-	17
<b>Total</b>	<b>5</b>	<b>9</b>	<b>2</b>	<b>7</b>	<b>12</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>3</b>	<b>50</b>

\***Volunteer types:** 1 No trapping, surveying only 2 trap host, no dispatch 3 trap host, including dispatch 4 trap-loan coordination / response, including dispatch 5 active trapping outside trap-loan scheme

260

261 *ii. Interviews and participant observation*

262 The primary method of data generation was semi-structured interviews, following a  
 263 schedule of topics that was adapted to different participants and management  
 264 contexts.<sup>2</sup> We also used, where appropriate, 'go-along' interviews, in which  
 265 "fieldworkers accompany individual informants on their 'natural' outings,  
 266 and...actively explore their subjects' stream of experiences and practices as they  
 267 move through, and interact with, their physical and social environment" (Kusenbach,  
 268 2003, p463). This method complements the discursive focus of 'static' interviews  
 269 with observations and interpretation of material practices (Rapley, 2007; Wanderer,  
 270 2014). The lead author also participated in relevant events: a volunteer recruitment  
 271 evening in Wales, a volunteer update meeting in Scotland, a volunteer working group  
 272 in northwest England, and an excursion with members of a forestry organization in  
 273 southwest England.<sup>3</sup> All fieldwork took place between April and July 2016.

<sup>2</sup> A sample interview schedule is provided in Supplementary Data A.

<sup>3</sup> In Wales, Scotland and southwest England these events included informal discussions with attendees (who were informed about the researcher's presence and purpose). Informal discussions were not recorded, but field notes were taken. At the volunteer working group in northwest England, the semi-structured interview schedule was adjusted to a group interview format. The group interview was recorded and transcribed.

274

275 *iii. Analysis*

276 Our analysis began with a detailed reading of field notes and interview transcripts,  
277 and loose coding of emergent ideas and themes (using NVivo for Mac v11.4). We  
278 then focused on identifying patterns in how practitioners spoke about (both species  
279 of) squirrels, the ‘place’ of squirrels in Britain, and the role of squirrel management;  
280 how they explained their decisions and ethical positions; and how squirrel control  
281 was ‘done’ in practice. We organised these patterns into several ‘interpretive  
282 repertoires’ (consistent variations in discursive patterns of explanation, justification  
283 and terminology: Wetherell and Potter, 1988) associated with relatively consistent  
284 variations in management strategies and methods. We combined these repertoires  
285 of discursive and material practices into ‘modes of killing’: collectives of motivation,  
286 morality, aims and actions that do not necessarily correspond to the categorisation of  
287 participants, but of different orientations towards the meaning and purpose of killing,  
288 and how it is performed (Marvin, 2010). Our use of this orderly typology is primarily  
289 for analytic clarity, as these modes are connected in complex ways, and not mutually  
290 exclusive: practitioners might shift between modes, depending on context.

291

292 **Results: arenas and modes of killing**

293

294 *i. Red squirrel conservation and reparative/sacrificial killing*

295 For participants **involved in** grey squirrel control for red squirrel conservation, killing  
296 was often considered a ‘nasty necessity’ (Temple, 1990): an unpleasant but  
297 fundamental component of conservation work. Killing for conservation is a complex  
298 issue. People working to protect species and ecosystems are generally motivated by  
299 an interest in preserving – rather than curtailing – wild lives. Consequently,  
300 participants were often quick to emphasize that they would rather not kill animals.  
301 However, there was broad consensus that killing grey squirrels was acceptable in  
302 the context of the “greater good” (Matthew, squirrel control officer) of biodiversity  
303 conservation, and was currently the only realistic means protecting red squirrels.

304

305 Several connected but subtly different concerns underpin the ‘killing for conservation’  
306 rationale. Participants regularly referred to the importance of preserving native  
307 nature, and introduced species that disrupt the ‘natural balance’ of native ecologies

308 therefore required control. This argument was closely intertwined with the belief that,  
309 because people were responsible for introducing grey squirrels, they also have a  
310 moral duty to manage the consequences: “We mucked it up basically [by] upsetting  
311 the balance originally, and I think we need to try and undo that” (Matthew). “We”, it  
312 was argued, should correct the mistakes of ancestors and conspecifics: “We as  
313 mankind, if you like, have contributed to the demise of some of these species; it’s our  
314 responsibility to redress that imbalance” (Paul, volunteer trap-loan coordinator).  
315 Thus, killing grey squirrels is considered not just an unfortunate aspect of managing  
316 and correcting imbalances in nature, but – when these imbalances are  
317 anthropogenic – a moral duty. This finding is consistent with existing literature that  
318 has identified and explored the ways in which the ethical underpinnings of  
319 contemporary biodiversity conservation emphasise the preservation and flourishing  
320 of particular (often native and/or rare) collectives, even – and sometimes  
321 determinedly – at the expense of (non-native, abundant) others (Biermann &  
322 Mansfield, 2014; Srinivasan, 2014; van Dooren, 2015).

323

324 More specifically, killing grey squirrels is understood as a necessary component of  
325 red squirrel conservation. One volunteer, after emotively recounting the collapse of  
326 the local red squirrel population following a disease outbreak, explained: “I’d rather  
327 not [kill grey squirrels]. But...in the interests of saving the [red] squirrels, it’s a  
328 necessary evil. It’s the injustice that gets me, it is the injustice of this – it is all our  
329 fault, and we need to do something about it” (Deborah). Similarly, Gwen, another  
330 volunteer, said: “I don’t like doing it, I’ve never killed anything in my life...but then,  
331 the reds have to be saved, don’t they? ...I really don’t have much choice.”

332

333 These and other conservation volunteers expressed a sense of personal  
334 responsibility not only to correct anthropogenic ecological disruption, but also to  
335 defend animals with whom they felt connected, and which might otherwise be lost  
336 (see also Lurz, 2014). Jan explained that, “I’d never given red squirrels a second  
337 glance, because the[y] were always there. And suddenly...they weren’t...and that  
338 was really what [motivated me] ...I thought, that’s just dreadful, because red  
339 squirrels belong here...” Humans can develop emotional and material attachments to  
340 ‘charismatic’ (Lorimer, 2007) species through positive interactions, and specific  
341 populations and organisms can become integrated into personal, community and

342 cultural identities. Should these valued individuals or collectives be threatened, their  
343 human supporters rally to their defence, committing extensive time, resources and  
344 emotional energy to their protection. Such attachments were evident amongst  
345 conservation volunteers, and commented on by conservation professionals: “[People  
346 in this area] kind of feel like [the red squirrel is] theirs, and so they need to protect it –  
347 it’s like they’ve got ownership of those red squirrels, really” (Jessica, conservation  
348 project officer). Red squirrels, then, are not simply protected as an ecologically  
349 ‘native’ species, but also carry important cultural values. These include nostalgic  
350 affection (“We want to see some about! As I did as a kid, you know”: Eric, volunteer);  
351 associations between isolated red squirrel populations and the identities of  
352 communities and locales (“people are quite proud [of the squirrels] ...that sounds  
353 silly, but it’s something special, isn’t it?”: Lin, volunteer); and even links with national  
354 identity, as “one of those iconic [Scottish] species” (Sandra, local government  
355 official).<sup>4</sup> The red squirrel’s popularity (particularly in the regions they persist) may be  
356 intensified by the grey squirrel’s presence and expansion, that is, part of the red  
357 squirrel’s contemporary appeal appears to lie in its status as the victim and underdog  
358 of an unfolding struggle between ecologically similar species: “the greys [have] got a  
359 couple of weapons haven’t they, they’ve got the pox virus, they eat them out of  
360 house and home, they can eat the food earlier...everything’s against the reds!”  
361 (Barry, volunteer).

362

363 Nevertheless, individual grey squirrels were still often regarded as ‘innocent’, and  
364 their killing caused some participants discomfort and regret. Gillian, a volunteer in  
365 Scotland, was strongly protective of red squirrels but felt unable to fully support lethal  
366 control of grey squirrels, because “it’s not the squirrel’s fault, [yet] it’s the squirrel that  
367 gets murdered!” This encapsulates an important dilemma that many participants  
368 faced; they felt people had a moral responsibility to ‘undo’ ill-considered  
369 introductions, and protect red squirrels, but disliked the idea that it was grey squirrels  
370 that would ‘pay’ for this. However, even though some participants sympathised with,

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<sup>4</sup> Our participants only occasionally specified this as a motivational factor, however, it is clearly a component of broader public interest in red squirrels: 88% of Aberdeenshire respondents to a Scottish Natural Heritage (the statutory nature conservation organization) survey associated the red squirrel specifically with Scotland (Ashbrook Research and Consultancy Ltd. and Ashbrook Research & Consultancy Ltd., 2010), and in 2013 it was voted runner-up of ‘Scotland’s Big 5’ wildlife species (Tonkin et al., 2016).

371 and even expressed respect for grey squirrels, there was a widespread belief that  
372 their choice was straightforward: “You can’t have both squirrels. You can have one,  
373 or you can have the other, but you can’t have both” (Diana, volunteer). Grey  
374 squirrels, therefore, are sacrificed so that red squirrels might persist. We have  
375 termed this approach to killing ‘reparative/sacrificial’, because it is motivated by a  
376 sense of moral duty and responsibility towards anthropogenically-disrupted  
377 ecologies, and protectiveness of red squirrels. It is accompanied, however, by  
378 unease about killing ‘innocent’ wildlife, which is overcome by framing squirrel killing  
379 as a necessary sacrifice.

380

381 Official red squirrel conservation projects advocate systematic live-trapping of grey  
382 squirrels. Systematic trapping is considered the most effective means of ‘clearing’ an  
383 area of grey squirrels, and live-trapping is necessary where red squirrels are present  
384 because kill-traps cannot discriminate between the two species. Trapped squirrels  
385 are killed by a shot to the head with an air pistol/rifle, or by cranial concussion. The  
386 latter involves transferring the squirrel to a hessian sack before delivering a forceful  
387 blow to the head with a heavy, blunt object (often a weighted wooden ‘priest’). The  
388 procedure is visceral and physical, and can be challenging and anxiety-inducing to  
389 perform (and indeed, to witness). Trapped squirrels are vocal and agitated, and may  
390 twitch, convulse and/or gasp following the strike. Ironically, these affecting final  
391 reflexes are good indications that the blow was sufficient to immediately stun, and  
392 rapidly kill, the squirrel (Central Science Laboratory, 2009). To be this effective,  
393 however, the strike requires confidence and commitment: “You’ve got to put brutality  
394 behind it. So, do it as if you really mean it, doing it half-hearted is not going to do the  
395 job, it’s going to stress the animal” (Craig, squirrel control officer).

396

397 Practitioners of all kinds reported feeling responsible for killing ‘properly’ (skilfully and  
398 confidently enough to ensure a rapid, ‘humane’ death), but this was made  
399 particularly explicit by those performing reparative/sacrificial killing, where there was  
400 evidence of a heightened sense of moral responsibility towards grey squirrels:

401

402 Lloyd: I’ve killed probably thousands of grey squirrels but...I even get anxious  
403 doing it, I still just get ever so slightly nervous, every time...because I’m  
404 anxious to do it properly.

405 Tim: Every time I do one, I want it to be the one hit, and it's gone. And that's  
406 always the thing...am I gonna hit this right so it's finished straight  
407 away?

408 (Wildlife management professionals assisting conservation project)

409

410 The persistent discomfort surrounding reparative/sacrificial killing produces a range  
411 of strategies by which participants detach and/or distance themselves from the  
412 troubling act of killing. Detachment, here, describes processes by which practitioners  
413 cognitively or physically remove themselves from killing, even as they perform it.  
414 Barry, a volunteer, explained why he preferred shooting over cranial dispatch: "You  
415 feel more detached...it sounds corny, but you go into the zone...it's a target...you  
416 don't even think that it's an animal." Tim (see above) further explained that "I don't  
417 look at the animals before I do it...if there's an animal in [the trap] it goes straight in  
418 the sack."<sup>5</sup> However, as Craig noted, cranial concussion warrants a certain 'brutality'  
419 that an emotionally detached person may find difficult to muster. One method of  
420 overcoming this involves channelling anger and frustration at the broader situation  
421 towards the individual to be killed: "I recognise that you have to sort of demonise the  
422 squirrel in a way, in order to do it. You think, that's the baddy, and we're doing it for  
423 the red squirrel" (Lloyd). Thus, the moral imperatives of reparative/sacrificial killing  
424 provide the emotional impetus to kill whilst simultaneously enabling practitioners to  
425 detach from, and justify, individual deaths. Here, grey squirrels are killed, but are  
426 nevertheless *not* considered 'killable': their killing is a moral and physical challenge  
427 that must be overcome every time, and is justified in relation to a specific context  
428 and/or 'bigger' ethical rationale.<sup>6</sup>

429

430 Practitioners might cognitively and emotionally detach themselves from killing (with  
431 the assistance of tools like the sights of a gun or a hessian sack), but they are  
432 nevertheless the immediate cause of death. Other participants found these acts too

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<sup>5</sup> The hessian sack serves multiple roles: the darkness calms the squirrels; it can be rolled to help immobilise and position them; and the practitioner can't see "it's snooky [cute] little face...it's little fluffy tail" (Annette, volunteer)

<sup>6</sup> We reiterate here that not all in the red squirrel conservation community approach killing in 'reparative/sacrificial' mode, and express remorse at grey squirrel deaths: some, instead, respond to grey squirrels primarily as 'invasive aliens' that do not 'belong', and therefore take a more categorical approach to killing (discussed later).

433 challenging, however, and although they bring about squirrel deaths, they also  
434 perform ‘choreographies of separation’ (Law, 2010) through which they physically  
435 and perceptually distance themselves from killing. For example, despite it being  
436 illegal in Britain under the Animal Welfare Act (2006), significant concerns about its  
437 humaneness (Central Science Laboratory, 2009), and a high-profile prosecution  
438 (Ellicott, 2010), drowning trapped squirrels is still, seemingly, a common practice  
439 (see also Ginn, 2016). This method of killing, while deliberate, is less immediately  
440 violent than shooting or cranial concussion. By submerging the trap in water (and  
441 closing a lid), it is possible to ‘walk away’ from the squirrel’s death.

442

443 Those unable or unwilling to kill squirrels themselves can also create distance by  
444 having someone else kill for them. In some regions, professional grey squirrel control  
445 officers enable householders to participate in management without needing to kill.  
446 Householders monitor a trap, cover trapped squirrels (which serves to calm both  
447 squirrels and discomfited humans), and phone a control officer. There is an  
448 interesting split, however, between those householders who then avoid further  
449 involvement and those who “want to see it through, from reporting...to seeing the  
450 squirrel killed. It’s like a process for them. They’d rather see it right the way through  
451 to the very end” (Craig). Some participants of these schemes therefore purposefully  
452 face killing, whilst simultaneously maintaining some distance from it.

453

454 A final note on distancing is the role played by terminology. The most common term  
455 employed for killing squirrels is ‘dispatching’. Although dispatch has long been a  
456 **euphemism** for ‘kill’, this is a secondary meaning. Primarily, ‘to dispatch’ means ‘to  
457 send off’; indeed, one volunteer (and former pest controller) recounted how the term  
458 had caused confusion in the past, when he had included it in a technical note and  
459 subsequently been asked: “Where are you dispatching them to?” (Frank). Several  
460 participants mused that they would happily ship all grey squirrels ‘back’ to America.  
461 ‘Dispatching’ hints that the relation of killer to killed, in reparative/sacrificial mode, is  
462 not necessarily one of vitriol, retribution, or even justice. Rather, it can be interpreted  
463 as simply a desire to make grey squirrels *absent* (Ginn, 2014), by whatever means  
464 necessary.

465

466 Management approaches that might achieve the same goals – restoration,  
467 conservation, atonement – with less strain are therefore appealing to those  
468 performing reparative/sacrificial killing. One such alternative is ‘biocontrol’ of  
469 squirrels through the reintroduction of native pine martens *Martes martes*, a  
470 tantalisingly plausible ‘solution’ to the seemingly Sisyphean task of killing grey  
471 squirrels in perpetuity. The idea that healthy pine marten populations could control  
472 grey squirrel populations through predation has been around for some years (see  
473 Barr et al., 2002). It has recently been reinvigorated, however, following an influential  
474 Irish study that identified a negative correlation between pine marten and grey  
475 squirrel abundance (Sheehy and Lawton, 2014). Several organisations are now  
476 engaged in projects that aim to restore pine martens to British woodlands. The  
477 restoration of a native species (formerly subject to human persecution) is itself  
478 reparative; that this might serve to control a problematic species is considered a  
479 bonus (Macpherson et al., 2014). Furthermore, successful biocontrol would limit the  
480 amount of killing (by humans) involved. It is therefore particularly appealing to those  
481 permanently troubled by the act of killing, who might prefer the more ‘natural’,  
482 nourishing, and hidden deaths afforded by pine marten predation.

483

484 *ii. Woodland protection and stewardship killing*

485 Where red squirrels are no longer present, grey squirrels are often killed with the aim  
486 of protecting trees, particularly timber trees. Private economic interest is therefore an  
487 important motivation, although the economics are more nuanced than ‘kill squirrels,  
488 save trees’: “you’ve got to look at the difference in value of undamaged broadleaf  
489 timber...compared with what you’d be able to sell it for as firewood. And the  
490 difference in value is in theory what you could afford to spend on squirrel control. If  
491 you could be sure that squirrel control [would prevent damage]” (Ian, forestry  
492 professional). However, squirrel control is not, contrary to hope or expectation,  
493 guaranteed to prevent damage, and might even exacerbate it (Rushton et al., 2002).  
494 Bark-stripping therefore has consequences beyond simple economic loss; it can also  
495 affect woodland composition, because (a) cumulative damage stunts tree growth and  
496 reduces canopy height and (b) growing hardwoods is a significant investment, and  
497 uncertain economic returns mean that some ageing plantations are not being  
498 replaced.

499



500 Squirrel control is also motivated, therefore, by the expectation that without it, native  
501 broadleaved woodlands will not flourish long-term. There is an emotional component,  
502 too, to the (often sudden) ‘devastation’ of trees by squirrels: “You look up, and you  
503 think, heavens, that’s been growing there for ten, fifteen, twenty years, and it’s been  
504 ruined during the last week, and...now it’s had it.” (Richard, woodland owner). This  
505 problem is compounded by a similar, contemporaneous struggle with the  
506 management of (native and introduced) deer populations; indeed, squirrels and deer  
507 were raised as issues in tandem in most of our conversations with foresters.  
508 Furthermore, trees are multivalent, and the commercial, amenity and conservation  
509 value of woodlands are intertwined: “I have heard the argument that a squirrel-  
510 damaged tree is still a habitat. [But] trees and woodlands can produce a resource  
511 and be sustainable. If you’ve got a pest in them that’s completely undermining the  
512 economics, then you’re just having a bush [with] dead wood and insects in it”  
513 (Robert, forestry professional).

514

515 A broader ethos here, then, is that “[the countryside] has to work, and it has to pay  
516 for itself” (Paul, wildlife management professional). The countryside (and wildlife  
517 therein) is considered productive property to be carefully maintained, or stewarded,  
518 by humans, and wildlife management – including killing – is part of this caretaking  
519 and harvesting. ‘Stewardship’ killing is therefore motivated by (not necessarily  
520 economic or instrumental) evaluations of the benefits of various environmental  
521 components – including trees, squirrels, and deer – against the costs of intervention.  
522 It is underpinned by an anthropocentric, utilitarian ethic (Minteer, 2013), in which  
523 economics and the maintenance of productive landscapes for future generations are  
524 important motivators. Conservation (especially of native or ‘traditional’ trees), still  
525 plays a role, but this tends to be secondary, for example: “[our woodland is]  
526 managed for commercial production...but very much with an eye to the landscape  
527 and wildlife...we encourage retention of British, indigenous hardwoods” (Arthur,  
528 woodland owner).

529

530 Squirrels are evaluated negatively where (and because) they create problems for  
531 property and profit, and/or threaten valued landscapes. Correspondingly, killing is  
532 practised when it is considered warranted and worthwhile: “We felt the need to  
533 exercise some degree of control, just to reduce the population to the point where the

534 damage [squirrels] do is acceptable rather than unacceptable” (Ian, forestry  
535 professional). The grey squirrel’s status as an introduced species is less pertinent to  
536 stewardship killing than the amount of damage they cause, though it is still relevant,  
537 due to their apparently greater economic impacts in British woodlands than in their  
538 native range (perhaps related to differences in population density). Nevertheless, red  
539 squirrels, a former “prime pest of the forester” (Ritchie, 1920, p297) were also  
540 historically subject to extensive ‘stewardship killing’ in coniferous forests. In this  
541 mode, being a ‘pest’ renders grey (and, previously, red) squirrels killable, as it  
542 renders deer and other nuisance wildlife killable. That is, it is always acceptable to  
543 kill pests. What constitutes a ‘pest’, however, is dependent on both the subject and  
544 its placing (as matter out of place (Douglas 1968), and shifts according to the aims of  
545 stewardship and extent of the problem. Here, then, squirrels are generally classified  
546 as killable, in the sense that they are configured as one of a range of species that  
547 might ‘require’ control. However, the appropriateness and probability of killing is  
548 nevertheless context-dependent.

549

550 In practice, stewardship killing is decidedly matter-of-fact. The lead author  
551 accompanied Greg, a professional wildlife manager, on a trap-checking round. On  
552 encountering a trapped squirrel, Greg coaxed it into a well-used hessian sack, before  
553 quickly twisting the end and securing it with his foot. He delivered a swift, hard blow  
554 to the squirrel’s head, before turning out the sack to confirm the kill. He checked the  
555 sex and condition of the squirrels’ bodies, but left them in the woodland “for the  
556 buzzards”. This was all done quickly, calmly, and without ceremony. Greg only  
557 expressed minor discomfort when recounting that he sometimes killed lactating  
558 females (as their young would then starve). Nevertheless, he kills every trapped  
559 squirrel, because “[shrugs] it’s the job, isn’t it?”<sup>7</sup> Greg’s actions were not carried out  
560 in an aggressive or zealous manner. Neither, however, did he express unease about  
561 the squirrels’ deaths. Several professional wildlife managers working in red squirrel  
562 conservation also approached killing in this pragmatic mode, and attributed their  
563 relative comfort to their socio-cultural backgrounds (in farming and/or ‘countryside  
564 management’), for example: “I was a gamekeeper, so trapping was second  
565 nature...I’ve been involved ever since I was young in shooting and fishing” (Craig).

---

<sup>7</sup> It is also illegal to release grey squirrels once trapped.

566

567 The proposition that people can become inured to killing was supported by  
568 participants who had ‘never killed anything before’ (a repeated refrain) and initially  
569 felt nervous, squeamish and upset, but found killing squirrels easier with repetition  
570 and experience. Possibly, then, early and/or regular involvement with, or exposure  
571 to, killing wildlife produces a better ability to cope with (or never develop) emotional  
572 discomfort (something McLeod, 2007 also proposed in relation to duck hunters). Still,  
573 even amongst the most pragmatic, certain situations could provoke emotional  
574 discord; notably, one professional found killing squirrel kits upsetting because they  
575 “scream”.

576

577 Inhumane methods, including drowning, were considered “unnecessary” (Paul).  
578 However, there are indications that this utilitarian approach to killing allows trade-offs  
579 between humaneness and economics: warfarin, for example, causes prolonged  
580 suffering, but tended to be rejected or promoted based on its assumed effectiveness,  
581 rather than the humaneness of its action.<sup>8</sup> Similarly, although humane kill-traps were  
582 ostensibly preferred, there were indications that this could also be contingent on  
583 cost: “[Humaneness is] all to do with how long it takes to kill something efficiently,  
584 and you’re talking about seconds or something...Well, a Fenn trap’s ten quid and the  
585 recommended alternative’s fifty” (Richard). The popular, inexpensive Fenn Mk IV  
586 was believed ‘on the way out’ due to the trap failing to satisfy international standards  
587 for humaneness for a different target species, the stoat *Mustela ermine* (Warburton  
588 et al., 2008). Wildlife management professionals repeatedly mentioned  
589 GoodNature™ traps (<http://www.goodnature.co.nz>) as a potential alternative, as it  
590 was hoped that a version of this might become licensed for squirrel control, thereby  
591 bringing the possibility of more *efficient* killing. There were high expectations for this  
592 gas-powered device, which rapidly kills curious individuals with a bolt to the head,  
593 drops the body to the ground, and resets itself. This new killing technology makes

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<sup>8</sup> Forestry professionals were divided on the importance of both warfarin and the recent withdrawal of its licenced use in the UK. Two reported using warfarin for years with little reduction in damage, and therefore considered it no great loss, but one reported recent damage to a stand of oaks that he attributed to the removal of warfarin.

594 deaths quicker and cleaner, and significantly reduces the labour required to check,  
595 clear and reset kill-traps.<sup>9</sup>

596

597 Woodland managers also considered systematic trapping the most effective means  
598 of reducing squirrel numbers. However, it is resource-intensive and, if practised in  
599 isolation, creates sinks into which surrounding populations may rapidly disperse.  
600 Foresters and woodland owners expressed frustration that their neighbours didn't  
601 undertake consistent (or any) control; this was considered poor stewardship.  
602 Accordingly, some were seeking political and financial support for more effective,  
603 coordinated and collaborative 'landscape-scale' management.

604

605 *iii. Controlling vermin, controlling invasives, and categorical killing*

606 The term 'vermin' has a long history, and designates a shifting category of  
607 troublesome animals as, fundamentally, "the enemy" whose killing is not just  
608 accepted, but expected (Fissell, 1999). Some practitioners place squirrels in this  
609 category, along with a variable collection of other species including rats, mice,  
610 rabbits, foxes, corvids, mustelids and/or raptors. Routine vermin control takes place  
611 both within and outside of conservation projects and strategic pest control. For  
612 example, one farmer at a volunteer event explained that he shot squirrels anyway,  
613 but took advantage of the free trap provided by the local trap-loan scheme. Indeed,  
614 participants working in conservation rarely encountered difficulties obtaining  
615 permissions to trap on farmland, which they attributed to "an  
616 understanding...amongst farmers" (Lloyd, wildlife management professional) about  
617 the need for vermin/pest<sup>10</sup> control.

618

619 We call this mode of killing 'categorical', because it targets squirrels (and other  
620 animals) not because of what they *do*, but because of what they *are*. In stewardship  
621 killing, squirrels are killed because of what they 'do' (cause nuisance or damage) as

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<sup>9</sup> At the time of writing, however, GoodNature™ traps have not yet been approved for squirrel control in the UK.

<sup>10</sup> The terms 'pest' and 'vermin' are sometimes used interchangeably. However, 'pest' can be used both as a categorical indictment (like vermin) and to describe animals that are demonstrably creating problems. Reactive pest control is normally more closely aligned with 'stewardship killing' than 'categorical killing'. To avoid confusion, we use the term 'vermin' throughout.

622 individuals or subpopulations, over relatively small spatio-temporal scales (i.e. within  
623 vulnerable woodland during a key growth period). Reparative killing takes place  
624 because of what grey squirrels are perceived to 'do' as a collective – their  
625 replacement of red squirrels and spreading of disease.<sup>11</sup> The act of classification  
626 renders anything within that category 'killable': subject to being killed always and  
627 everywhere. Indeed, whereas the key ethical questions for other modes of killing are  
628 about justifying actions (why/when/where/how would you kill grey squirrels?), the  
629 equivalent for categorical killing is about justifying restraint (why would you *not* kill  
630 squirrels?). Accordingly, some participants were confused when asked if there were  
631 places or times when grey squirrels should *not* be killed. They responded that  
632 squirrels should always be subject to control because they are 'vermin', 'a pest' or  
633 'an invasive' (more on the latter below).

634

635 The term 'tree-rat' (applied to grey squirrels in Britain since at least 1936: Coates,  
636 2015) is a discursive indication that this deadly classification has occurred. Like 'rats  
637 with wings' for pigeons, 'tree-rat' loads squirrels with "the moral and aesthetic  
638 baggage of the rat" (Jerolmack, 2008: p87), indicating they should be received and  
639 treated as rats are: "if you think of them in those terms, then that's the way they need  
640 to be dealt with – right through from killing, controlling – to not eating" (Ian, forestry  
641 professional). The term not only renders squirrels killable, but also, because of the  
642 association between vermin and disease, makes them inedible (which can present  
643 an obstacle for those who argue that grey squirrels should be harvested for food).  
644 Although 'tree-rat' is regularly applied to grey squirrels, red squirrels are exempted.  
645 Participants put this discrepancy down to fundamental differences in the species'  
646 appearance and behaviour (e.g. "there is something more rodent-like about grey  
647 squirrels, they're not as charming": Jan, conservation volunteer). However, it is worth  
648 reiterating that until relatively recently, red squirrels were considered equally  
649 verminous (Holmes, 2015). They have since undergone 'reputation rehab'  
650 (Jerolmack, 2008), however. As one controller in Scotland pointed out, "red squirrels  
651 are just tree-rats with good PR" (Jenny, squirrel control officer).

---

<sup>11</sup> Another key difference between stewardship and reparative/sacrificial is that pests are killed because they are perceived as 'culpable' for damage they cause; squirrels killed for reparative/sacrificial purposes are perceived as 'innocent', and humans as responsible for the problems they create.

652

653 Throughout the 20<sup>th</sup> century, as different ways of valuing wildlife have emerged and  
654 interest in wildlife conservation grown, the concept of ‘vermin’ has consistently been  
655 challenged and the list of species to which the classification applies (legally, at least)  
656 has reduced (Smout, 2003). Arguably, however, the categorisation of species as  
657 ‘invasive’ is replacing ‘vermin’ as a label that designates certain animals as ‘out of  
658 place’ (Crowley, 2014; Milton, 2000), troublesome and, ultimately, killable. Numerous  
659 participants advocated killing grey squirrels nationwide on the basis that they were  
660 ‘invasives’, even when/where this was unlikely to have any substantive benefit for  
661 either red squirrels or trees: “I don’t see any excuse for treating an animal cruelly, but  
662 I don’t see any other reason not to control grey squirrels” (Jenny, squirrel control  
663 officer) and “the more [control] the better, it’s just getting people to do it really, isn’t  
664 it?” (Matthew, squirrel control officer). The ‘ethical taxonomy’ of invasive species (van  
665 Dooren, 2011), then, does similar work to ‘vermin’, with material effects: for example,  
666 grey squirrels can be killed year-round and without limit in Britain, whereas red  
667 squirrels cannot be legally killed without a specific licence. It is worth noting at this  
668 juncture that the concept of ‘invasive species’ is multi-faceted and contested both  
669 within and beyond academia (Boonman-Berson et al., 2014; Humair et al., 2014).  
670 Here, participants tended to interpret the term in relation to the effects of grey  
671 squirrel introduction, rather than their non-native origin alone (see also Selge et al  
672 2011; Van der Wal et al 2015). They identified grey squirrels as invasive based on  
673 their replacement of, and perceived harms to, red squirrels. Nevertheless, those who  
674 used the term generally applied it categorically to grey squirrels in the UK,  
675 irrespective of variability in different populations’ risk to red squirrels.

676

677 Categorical killing is associated with (largely discursive) political endeavours to  
678 influence cultural and politico-legal valuations of squirrels, and encourage more  
679 extensive and/or more intensive control, rather than a specific management strategy.  
680 Several participants referred to an ongoing “psychological war” (Frank, volunteer)  
681 against what is believed to be (a) loss of societal attachment to/concern for the red  
682 squirrel and (b) an insidious ‘invasion’ of grey squirrels into the UK’s cultural  
683 discourse and its citizens’ affections. The ‘defence’ against these perceived socio-  
684 cultural changes is being mounted on three fronts. First, there is the promotion of the  
685 red squirrel, including work to “establish a network of red squirrel enclaves in Grey

686 Squirrel Britain” (Vass, 2016 [UK Squirrel Accord]). Making red squirrels physically  
687 present and visible is intended to instil and/or reinvigorate attachments amongst  
688 British publics who no longer encounter them, and help “alleviat[e] some of the  
689 anxiety that a strong grey squirrel control will bring” (Vass, 2016). These  
690 developments are not just for red squirrel conservation, but also to improve the  
691 ‘public face’ and acceptability of grey squirrel control, and to promote engagement:  
692 “if we’re going to change public opinion on the greys we need a flagship to pin it on  
693 and the reds is the obvious one” (Arthur, woodland owner).

694

695 A second component of this ‘psychological war’ is resistance to socio-cultural  
696 (including legal) assimilation of grey squirrels. The 2014 removal of a clause in the  
697 Grey Squirrels (Prohibition of Importation and Keeping) Order 1937 means it is no  
698 longer a legal requirement to report grey squirrel sightings. The Red Squirrel Survival  
699 Trust, however, “didn’t feel comfortable supporting this move because it’s one step  
700 closer to accepting an invasive non-native species and giving it the right to live here”  
701 (spokesperson quoted in Cohen, 2014).<sup>12</sup> Some of our participants also criticised  
702 organisations that depict grey squirrels in promotional materials, and ‘the media’ was  
703 accused of “paint[ing squirrels] as harmless, fluffy little fun things” (Arthur), or “good,  
704 cuddly, something to be encouraged” (Richard, woodland owner). Their implication is  
705 that these depictions are inappropriate, misleading, and even subversive, rather than  
706 reflections of broader shifts in public attitudes. The third strategy, then, is to ensure  
707 that if grey squirrels are to be culturally salient, this is as “public enemy number  
708 one...There are people who think that grey squirrels are sweet...if they were referred  
709 to as tree-rats, which they are, that might elicit a different response” (Arthur). The  
710 message is that grey squirrels are not appropriate subjects of care or concern  
711 (indeed, some implied that encounters with them shouldn’t be encouraged or  
712 enjoyed), that their appropriate classification is as vermin or invasives, and that they  
713 should be treated (killed) accordingly.

714

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<sup>12</sup> Popular naturalist and television presenter Chris Packham was ‘named and shamed’ by several participants for having intimated that grey squirrels were here to stay. Packham has said that he is not opposed to all grey squirrel control, but that “killing greys where they do not threaten crops or infect reds is a complete waste of money, time and energy” (quoted in Flanagan, 2014).

715 *Tensions and alliances*

716 The divergent management rationales and strategies produced by the co-existence  
717 of these multiple modes can produce tensions between projects and practitioners.  
718 The importance that reparative/sacrificial killing places on regretful, necessary  
719 sacrifice, and the attendant configuration of grey squirrels as blameless ‘collateral  
720 damage’, sits uneasily alongside comprehensive, categorical killability, and  
721 associated disregard for – and even vilification of – grey squirrels: “there are people  
722 who want to malign grey squirrels and just get rid of them as vermin...[but] I would  
723 like them always to be treated with respect” (Emma, conservation project officer).  
724 Similarly, the potential introduction of GoodNature™ traps, and the associated ability  
725 to automate killing, troubled those who placed a lot of significance on the personal  
726 moral responsibilities of killing. Some were concerned that squirrel control might  
727 subsequently become *laissez-faire*: “if you can’t be bothered to come out and check  
728 a trap every day...you shouldn’t be trapping. You should care enough to want to do  
729 that” (Jenny, wildlife management professional).

730

731 There are also, however, areas of convergence between modes. Recreational  
732 hunting currently comprises a small proportion of squirrel control in the UK, and we  
733 did not directly investigate the motivations and practices of people who kill squirrels  
734 recreationally. Nevertheless, we would postulate that the aims and methods of  
735 recreational hunting likely constitute a fourth mode of killing that diverges again from  
736 those described here (Dickson, 2009; Marvin, 2010), and there are suggestions that  
737 ‘recreational killing’ could increasingly contribute to squirrel management. The British  
738 Association for Shooting and Conservation (BASC) is helping to develop a new  
739 strategy in which woodland owners allow recreational air-gunners to shoot grey  
740 squirrels at baited hoppers on their land.<sup>13</sup> Recreational shooters were therefore  
741 considered “a resource” (Richard) by some woodland owners and managers, as they  
742 provide a cost-effective supplementary control measure.

743

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<sup>13</sup> Accessibility is an important issue for hunting in Britain, and gaining permission to shoot in private or public woodland is not always straightforward. Shooting on publicly-accessible land raises safety issues, whereas hunting on private land without permission constitutes trespass. Furthermore, once killed wildlife becomes the property of the landowner, not the shooter.



744 Several conservation projects are also working with the BASC and/or volunteer  
745 squirrel-shooting clubs to “harness” (Harriet, conservation project officer) existing  
746 enthusiasms, and incorporate recreational shooting into conservation control  
747 measures. However, some participants expressed reservations about the  
748 contribution of recreational hunting to conservation projects, and particularly local  
749 eradications, which emphasise “getting those last few...but that [recreational]  
750 volunteer might want to go somewhere different where there’s lots of grey squirrels  
751 to shoot” (Jessica, conservation project officer). Furthermore, several expressed  
752 reservations about the morality of recreational killing, and its practitioners: “it’s the  
753 ones who enjoy killing that you’ve got to watch...I think the shootists are the ones  
754 that come closest” (Paul, volunteer).

755

### 756 **Concluding Discussion**

757 We have identified three prominent modes of killing squirrels (reparative/sacrificial,  
758 stewardship, and categorical), and have suggested that a fourth mode (recreational)  
759 may increase in prevalence. There are important differences as to how squirrels are  
760 killed and made killable within each mode (Table 2). In reparative/sacrificial mode,  
761 grey squirrels – as ‘innocent individuals’ – are not in principle considered killable, but  
762 are nevertheless regularly, if remorsefully, killed. In stewardship mode, squirrels are  
763 generally killable as ‘culpable pests’, but are nevertheless not always killed;  
764 decisions about their control are often pragmatic and contextual. In categorical  
765 mode, ‘vermin/invasive’ squirrels are killable always and everywhere. These multiple  
766 modes have effects, and in this final discussion we propose (continuing to draw on  
767 squirrel control as an exemplary case) that their different drivers and aims need to be  
768 well understood, and well articulated, in the development and implementation of  
769 wildlife management (or ‘co-existence’) projects, strategies and policies.

770

**Table 2:** Summary analysis of different ‘modes of killing’ grey squirrels in the UK.

	<b>Reparative / Sacrificial</b>	<b>Stewardship</b>	<b>Categorical</b>	<b>Recreational*</b>
<b>Primary ‘arena’</b>	Red squirrel conservation	Forestry / woodland management	Anywhere	<i>Game shooting</i>
<b>Attitude to lethal control</b>	Discomfort	Pragmatism	Approval	<i>Enthusiasm</i>
<b>Ultimate aim</b>	Red squirrel recovery	Healthy and productive woodland	Grey squirrel eradication	<i>Rewarding experiences</i>
<b>Preferred current methods</b>	Trap and dispatch	Kill-traps; Poison	Variable; most are acceptable	<i>Shooting</i>
<b>Current management strategy</b>	Stronghold defence; local eradication	Population reduction; reactive control	Proactive or routine control; publicity	<i>Ad-hoc; regular ‘squirrel days’</i>
<b>Preferred future alternative</b>	Biocontrol (pine martens)	More effective methods (e.g. GoodNature traps)	Coordinated, landscape scale control	<i>Greater opportunities and access</i>
<b>Are grey squirrels ultimately ‘killable’?</b>	No (but sometimes killed)	Yes (but sometimes not killed)	Yes (and always killed)	Yes ( <i>but should be ‘sporting’</i> )
<b>Grey squirrels as...</b>	Innocent sacrifices	Culpable pests	Inherently undesirable	<i>Fair game</i>

\* This final mode is provisional, as none of our participants practiced only recreational squirrel shooting. The suggestions here are based on (a) evidence from those participants involved in recreational shooting alongside other control activities, and (b) existing research exploring the drivers of recreational hunting more generally (e.g. Marvin, 2010).

772 Reparative/sacrificial killing is in line with a concern for biodiversity conservation and  
773 'love' of wildlife that is currently widespread amongst UK publics. Red squirrel  
774 conservation, including that which involves extensive lethal control of grey squirrels,  
775 attracts public funding and support. Indeed, in 2017, 'Red Squirrels United' (an  
776 umbrella project supporting initiatives in England/Wales/Northern Ireland) and  
777 'Saving Scotland's Red Squirrels' both received funding boosts to continue their work  
778 by enrolling 'armies' of volunteers (BBC, 2017a, 2017b). As we have seen,  
779 passionate and committed volunteers can overcome reservations about killing to  
780 make important contributions to these projects, yet it is also apparent that many find  
781 reparative/sacrificial killing challenging and emotionally draining. Even though there  
782 is relatively high support for lethal control of grey squirrels where it benefits red  
783 squirrels (Dunn and Marzano, 2015), many people nevertheless feel unable or  
784 unwilling to participate. There are also, of course, many others who are disinterested  
785 in, ambivalent about, or actively opposed to squirrel control, who would also be  
786 unlikely to volunteer.<sup>14</sup> Consequently, the uptake and retention of volunteers required  
787 to carry out lethal control – and the long-term success of volunteer-reliant strategies  
788 – may be limited. An associated public preference for strategies that involve less  
789 direct lethal control promotes support for alternatives such as pine marten recovery  
790 and the development of immunocontraceptives. These alternatives might, however,  
791 be more cost-intensive, and/or have less well-understood impacts at population  
792 level. Furthermore, and as Hodgetts (2017) also notes, indirect control methods such  
793 as immunocontraceptives or "pine marten proxies" (Hodgetts 2017, p23) are not  
794 exempt from ethical consideration or challenge.

795

796 Volunteer involvement is also a key component of the UK Squirrel Accord's drive to  
797 establish coordinated, 'landscape-scale' control efforts. One aim of the Accord is to  
798 facilitate more coordinated control through 'public education', mapping vulnerable

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<sup>14</sup> As this research was oriented towards understanding the motivations and aims of management practitioners, we have not explored the voices of those people who are not involved with, or are opposed to, killing squirrels. We are reticent, therefore, to make specific claims as to their feelings and beliefs, or the prevalence of opposition. However, our wider reading and observations during this research indicate that in addition to emotional discomfort and ethical reservations about killing, some (including Chris Packham, see note 10) do not support continued grey squirrel control because they believe it to be a futile exercise, or a lost cause.

799 areas of woodland, and the formation of squirrel management groups. Outside red  
800 squirrel areas, however, grey squirrel control primarily benefits private woodland  
801 owners, and is therefore challenged by the need to incentivize landowners who  
802 would be required to invest time, money, and potentially physical and emotional  
803 labour, into activities that do not benefit them. This highlights an important difference  
804 between the primary aims of stewardship killing (the benefits of which are unevenly  
805 distributed) and reparative/sacrificial killing (for the 'public good' of biodiversity  
806 conservation). There is also potential for discord to arise between people who  
807 practise and promote squirrel control for woodland stewardship and others who  
808 disagree that private interests are a legitimate rationale for killing wildlife.  
809 Stewardship killing is, however, often practised by professional wildlife managers  
810 who are comfortable and confident with their work, who are not permanently troubled  
811 by killing, but who nevertheless commonly maintain an interest in killing 'well'  
812 (humanely, effectively and efficiently). Professional wildlife managers can therefore  
813 play an important role in both woodland management and red squirrel conservation  
814 projects; indeed, as in Scotland, the presence of professional control officers can  
815 enable volunteers to engage confidently with management projects without being  
816 required to kill.

817

818 For categorical killing to effectively underpin management strategies, there needs to  
819 be widespread societal agreement that a species or population 'belongs' in a given  
820 category. 'Vermin', in wider society, has lost footing, although some species (e.g.  
821 rats, cockroaches) are still commonly represented and treated in this way. More  
822 recently, the 'invasive' category has become more influential, particularly amongst  
823 settler-descendent communities in post-colonial nations, where introduced species  
824 are key contributors to the decline of distinctive native biotas (Barker, 2010;  
825 Comaroff and Comaroff, 2001; Trigger et al., 2008). Categorical killing can, however,  
826 come into conflict with other 'modes of ordering' (Law, 1994) – including both those  
827 discussed here and others that render killing largely illegitimate – in which decisions  
828 about killing are made in relation to context, rather than category. In the UK, for  
829 instance, killing grey squirrels in urban areas where they pose no immediate threat to  
830 either property or red squirrels is likely to be contested. Furthermore, categorical  
831 killing has been associated with the objectification and de-individualisation of those  
832 killed, which can result in uncompassionate and even cruel practices. For example,

833 Trigger et al. (2008) note that violent methods permitted for killing invasive cane  
834 toads in Australia would “never be tolerated in relation to native or domestic animal  
835 species” (p1278: see also Parker, 2007; Potts, 2009; van Dooren, 2011). However,  
836 categorical approaches to management are more readily translated into policy and  
837 law than the complex, context-dependent rationales of other modes, and lend  
838 themselves to simple ‘educational’ messages and powerful rhetorical strategies.  
839 Indeed, the current legal status of grey squirrels in the UK renders them categorically  
840 killable.<sup>15</sup>

841

842 We have demonstrated that there are divergences and points of tension between  
843 different moralities, strategies and communities of practice. However, the  
844 coexistence of multiple modes of killing can also be productive (Law, 1994). The  
845 divergent ethical and practical priorities of different modes, and their simultaneous  
846 need to co-exist, mean that each community of practice challenges the others, and  
847 places checks and qualifiers on their activities. This can produce a rather eclectic  
848 assortment of management strategies – such as those that currently exist in relation  
849 to grey squirrels – but also means that new developments are often thoroughly  
850 scrutinized and debated. The competing philosophies of different modes also require  
851 governments, interest groups, and wider publics to continuously attend to, recognise,  
852 and articulate their values and aims, and negotiate with those of others. **Wildlife  
853 management in the UK is not a streamlined process, centrally governed with a single  
854 end goal. Much is initiated and directed by private interests and civil society  
855 organisations, and existing policies are loosely and patchily arranged around a  
856 diversity of views, traditions and agendas. The challenge for those involved in  
857 developing future policy and strategy is not, however, to separate and evaluate  
858 different modes of killing against one another, either to choose between them or to  
859 seek consensus. Rather, it is to identify and deliberate on the feasibility, desirability  
860 and consequences of the multiple ‘ends’ (ultimate aims) of management, and then to**

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<sup>15</sup> Grey squirrels are listed in Part I of Schedule 9 of the Wildlife and Countryside Act (1981), which makes it an offence to release them into the wild once caught, and the Grey Squirrels (Prohibition of Importation and Keeping) Order 1937, issued under the Destructive Imported Animals Act 1932, is still in force, meaning it is also illegal to keep grey squirrels in captivity. Captured grey squirrels must, therefore, be killed (unless a licence has been obtained for their captivity or release).

861 consider how the various means of achieving these ends – including, but not limited  
862 to, killing – might be arranged to achieve them (Foucault, 2007). This is how we  
863 understand the import of biopolitics – to open up a space for public contestation  
864 rather than to assume human control over nature (Lemke 2015; Hinchliffe, 2017).  
865 Practically, this will necessitate some degree of coordination between a currently  
866 diffuse collective of practitioners and decision-makers, to forge more direct,  
867 productive links between policy and practice. It should be noted that coordination  
868 does not, however, mean that there can be simple or single solutions, or that those  
869 coordinating their efforts will necessarily agree. Indeed, it may become apparent that  
870 some modes are fundamentally incompatible, and unsuited to shared strategies.

871

872 Despite this potential for disagreement and controversy, the existence of multiple  
873 modes can nevertheless prevent discussion about killing animals from becoming  
874 reduced to a binary question of ‘is this species killable or not?’, a problem which has  
875 caused other wildlife management debates to polarise and escalate (e.g. the  
876 persistent British conflict surrounding lethal control of badgers: see Cassidy, 2012).  
877 This is an incomplete and simplistic picture; killing practices are heterogeneous.  
878 Killing is contested, qualified, and rarely completely normalised: it is a troubling  
879 activity that requires constant reconsideration, appraisal, and understanding.  
880 Furthermore, killing practices cannot be considered in isolation: there is a need to  
881 understand modes of killing in relation to associated modes of producing and  
882 maintaining life. Consequently, no account of killing can assume that the question is  
883 ever simply ‘to kill or not to kill?’. In practice, the question is, ‘what kinds of killing are  
884 acceptable, practical, or even required, as means towards possible ends?’ We  
885 therefore propose that seeking out, articulating, and explicitly analysing the multiple  
886 ways in which wild life is killed and ‘made killable’ – as well as protected or made  
887 ‘un-killable’ – should form a fundamental component of wildlife management  
888 planning.

889 **References**

- 890 Asdal K, Druglitrø T and Hinchliffe S (2017) Introduction: the 'more-than-human'  
891 condition. In: Asdal K, Druglitrø T and Hinchliffe S (eds), *Humans, animals and*  
892 *biopolitics*. Abingdon, Routledge, pp. 1–29.
- 893 Ashbrook Research and Consultancy Ltd. (2010) *Assessment of public attitudes to*  
894 *grey squirrel control in Aberdeen*. Scottish Natural Heritage (Commissioned  
895 Report No. 384).
- 896 Atchison J, Gibbs L and Taylor E (2017) Killing Carp (*Cyprinus carpio*) as a  
897 Volunteer Practice: implications for community involvement in invasive species  
898 management and policy. *Australian Geographer* 48(3): 333–348.
- 899 Barker K (2010) Biosecure citizenship: politicising symbiotic associations and the  
900 construction of biological threat. *Transactions of the Institute of British*  
901 *Geographers* 35(3): 350–363.
- 902 Barr JJF, Lurz PWW, Shirley MDF, et al. (2002) Evaluation of immunocontraception  
903 as a publicly acceptable form of vertebrate pest species control: the introduced  
904 grey squirrel in Britain as an example. *Environmental Management* 30(3): 342–  
905 51.
- 906 BBC (2017a) Conservationists call for 'red squirrel army'. *BBC News (Online)*, 24th  
907 February. Available from: <http://www.bbc.co.uk/news/uk-39072939%0A>.
- 908 BBC (2017b) Red squirrel 'army' wins lottery funding for conservation battle. *BBC*  
909 *News (Online)*, 24th February. Available from: [http://www.bbc.co.uk/news/uk-](http://www.bbc.co.uk/news/uk-scotland-south-scotland-39066953)  
910 [scotland-south-scotland-39066953](http://www.bbc.co.uk/news/uk-scotland-south-scotland-39066953).
- 911 Biermann, C and Mansfield, B (2014) Biodiversity, purity, and death: conservation  
912 biology as biopolitics. *Environment and Planning D: Society and Space* 32:  
913 257–273.
- 914 Boonman-Berson S, Turnhout E and van Tatenhove J (2014) Invasive species: The  
915 categorization of wildlife in science, policy, and wildlife management. *Land Use*  
916 *Policy* 38: 204–212.
- 917 Cartmill M (1993) *A View to a Death in the Morning: Hunting and Nature through*  
918 *History*. London: Harvard University Press.
- 919 Cassidy A (2012) Vermin, Victims and Disease: UK Framings of Badgers In and  
920 Beyond the Bovine TB Controversy. *Sociologia Ruralis* 52(2): 192–214.
- 921 Central Science Laboratory (2009) *Review of methods of humane destruction of*  
922 *grey squirrels*. Scottish Natural Heritage (Commissioned Report No. 317).

923 Chantrey J, Dale TD, Read JM, et al. (2014) European red squirrel population  
 924 dynamics driven by squirrelpox at a gray squirrel invasion interface. *Ecology*  
 925 *and Evolution* 4(19): 3788–3799.

926 Clark JL (2015) Uncharismatic Invasives. *Environmental Humanities* 6(2013): 29–52.

927 Coates P (2015) A Tale of Two Squirrels: A British Case Study of the Sociocultural  
 928 Dimensions of Debates over Invasive Species. In: Keller RP, Cadotte MW, and  
 929 Sandiford G (eds), *Invasive Species in a Globalized World: Ecological, Social,*  
 930 *and Legal Perspectives on Policy*, London: University of Chicago Press, pp. 44–  
 931 71.

932 Cohen T (2014) Grey squirrel law scrapped: Ministers finally revoke 1937 legislation  
 933 that made failure to report presence of rodent on your land a criminal offence.  
 934 *Mail Online*, 19th March. Available from: [http://www.dailymail.co.uk/news/article-](http://www.dailymail.co.uk/news/article-2583947/Grey-squirrel-law-scrapped-Ministers-finally-revoke-1937-legislation-failure-report-presence-rodent-land-criminal-offence.html)  
 935 [2583947/Grey-squirrel-law-scrapped-Ministers-finally-revoke-1937-legislation-](http://www.dailymail.co.uk/news/article-2583947/Grey-squirrel-law-scrapped-Ministers-finally-revoke-1937-legislation-failure-report-presence-rodent-land-criminal-offence.html)  
 936 [failure-report-presence-rodent-land-criminal-offence.html](http://www.dailymail.co.uk/news/article-2583947/Grey-squirrel-law-scrapped-Ministers-finally-revoke-1937-legislation-failure-report-presence-rodent-land-criminal-offence.html).

937 Collard, RC (2012) Cougar-human entanglements and the biopolitical un/making of  
 938 safe space. *Environment and Planning D: Society and Space* 30: 23–42.

939 Comaroff J and Comaroff L (2001) Naturing the Nation: Aliens, Apocalypse and the  
 940 Postcolonial State. *Journal of Southern African Studies* 27(3): 627–651.

941 Crowley SL (2014) Camels Out of Place and Time: The Dromedary (*Camelus*  
 942 *dromedarius*) in Australia. *Anthrozoös* 27(2): 191–203.

943 Dandy N, Ballantyne S, Moseley D, et al. (2012) Exploring beliefs behind support for  
 944 and opposition to wildlife management methods: a qualitative study. *European*  
 945 *Journal of Wildlife Research* 58(4): 695–706.

946 Dickson B (2009) The Ethics of Recreational Hunting. In: Dickson B, Hutton J, and  
 947 Adams WM (eds), *Recreational Hunting, Conservation and Rural Livelihoods:*  
 948 *Science and Practice*, Oxford: Blackwell Publishing Ltd., pp. 59–72.

949 Dillard J (2008) A Slaughterhouse Nightmare: Psychological Harm Suffered by  
 950 Slaughterhouse Employees and the Possibility of Redress through Legal  
 951 Reform. *Georgetown Journal on Poverty Law & Policy* 15(2): 391–408.

952 Dunn M and Marzano M (2015) *Social acceptability of methods used to manage*  
 953 *squirrels in the UK*. Red Squirrels United Public Attitudes Survey - Summary  
 954 Report. Roslin, UK.

955 Ellicott C (2010) Hauled to court, forced to pay £1,500 and branded a criminal...for  
 956 drowning a grey squirrel. *Mail Online*, 20th July. Available from:



- 957 <http://www.dailymail.co.uk/news/article-1295883/First-case-kind-Man-told-pay-1->  
958 [500-guilty-drowning-squirrel.html](http://www.dailymail.co.uk/news/article-1295883/First-case-kind-Man-told-pay-1-500-guilty-drowning-squirrel.html).
- 959 Enticott G (2015) Public attitudes to badger culling to control bovine tuberculosis in  
960 rural Wales. *European Journal of Wildlife Research* 61(3): 387–398.
- 961 Everts J (2015) Invasive life, communities of practice, and communities of fate.  
962 *Geografiska Annaler: Series B, Human Geography* 97(2): 195–208.
- 963 Farnworth MJ, Watson H and Adams NJ (2014) Understanding attitudes toward the  
964 control of nonnative wild and feral mammals: similarities and differences in the  
965 opinions of the general public, animal protectionists, and conservationists in  
966 New Zealand (aotearoa). *Journal of Applied Animal Welfare Science* 17(1): 1–  
967 17.
- 968 Fissell M (1999) Imagining Vermin in Early Modern England. *History Workshop*  
969 *Journal* 47: 1–29.
- 970 Flanagan P (2014) Prince Charles backs plan for grey squirrel cull. *The Telegraph*,  
971 9th May. Available from:  
972 [http://www.telegraph.co.uk/news/earth/environment/conservation/10818545/Prin-](http://www.telegraph.co.uk/news/earth/environment/conservation/10818545/Prince-Charles-backs-plan-for-grey-squirrel-cull.html)  
973 [ce-Charles-backs-plan-for-grey-squirrel-cull.html](http://www.telegraph.co.uk/news/earth/environment/conservation/10818545/Prince-Charles-backs-plan-for-grey-squirrel-cull.html).
- 974 Forestry Commission (2016) *Woodland Area, Planting and Restocking*. Edinburgh,  
975 UK: Forest Research.
- 976 Forestry Commission (England) (2014) *Summary report on review of evidence*  
977 *underpinning grey squirrel policy in England*. Bristol, UK: Forestry Commission  
978 (England).
- 979 Forestry Commission (England) and Defra (2014) *Grey Squirrels and England's*  
980 *Woodland: Policy and Action*. Bristol, UK: Forestry Commission (England).
- 981 Foucault, M. (2007) *Security, territory, population: lectures at the College de France,*  
982 *1977-78*. Basingstoke: Palgrave Macmillan.
- 983 Fredriksen, A (2016) Of wildcats and wild cats: Troubling species-based  
984 conservation in the Anthropocene. *Environment and Planning D: Society and*  
985 *Space* 34: 689–705.
- 986 Ginn F (2014) Sticky lives: Slugs, detachment and more-than-human ethics in the  
987 garden. *Transactions of the Institute of British Geographers* 39(4): 532–544.
- 988 Ginn F (2016) *Domestic Wild: memory, nature and gardening in suburbia*.  
989 Abingdon: Routledge.
- 990 Ginn F, Beisel U and Barua M (2014) *Living with Awkward Creatures: Vulnerability,*

- 991           Togetherness, Killing. *Environmental Humanities* 4: 113–123.
- 992   Gurnell J, Wauters LA, Lurz PWW, et al. (2004) Alien species and interspecific  
993           competition: effects of introduced eastern grey squirrels on red squirrel  
994           population dynamics. *Journal of Animal Ecology* 73(1): 26–35.
- 995   Haraway D (2008) *When Species Meet*. London: University of Minnesota Press.
- 996   Hinchliffe S (2007) *Geographies of Nature: societies, environments, ecologies*.  
997           London: Sage.
- 998   Hinchliffe S (2017) Sensory biopolitics: knowing birds and a politics of life. In Asdal,  
999           K, Druglito, T, Hinchliffe, S (eds), *Humans, animals and biopolitics: the more  
1000           than human condition*. Routledge: Abingdon, pp. 152-170.
- 1001   Hodgetts T (2017) Wildlife conservation, multiple biopolitics and animal  
1002           subjectification: three mammals' tales. *Geoforum* 79: 17-25.
- 1003   Holmes M (2015) The perfect pest: natural history and the red squirrel in nineteenth-  
1004           century Scotland. *Archives of Natural History* 42(1): 113–125.
- 1005   Humair, F., Edwards, P.J., Siegrist, M. & Kueffer, C. (2014). Understanding  
1006           misunderstandings in invasion science: why experts don't agree on common  
1007           concepts and risk assessments. *NeoBiota* 20: 1–30.
- 1008   Ingold T (2000) *The Perception of the Environment: essays on livelihood, dwelling  
1009           and skill*. London: Routledge.
- 1010   Jerolmack C (2008) How Pigeons Became Rats: The Cultural-Spatial Logic of  
1011           Problem Animals. *Social Problems* 55(1): 72–94.
- 1012   King MR (2016) Killing and Feeling Bad: Animal Experimentation and Moral Stress.  
1013           *Animal Studies Journal* 5(2): 1–17.
- 1014   Knight J (2012) The Anonymity of the Hunt. *Current Anthropology* 53(3): 334–355.
- 1015   Kusenbach M (2003) Street Phenomenology. *Ethnography* 4(3): 455–485.
- 1016   Lave J and Wenger E (1991) *Situated Learning: Legitimate Peripheral Participation*.  
1017           Cambridge: Cambridge University Press.
- 1018   Law J (1994) *Organizing modernity*. Oxford: Blackwell.
- 1019   Law J (2010) Care and Killing: Tensions in Veterinary Practice. In: Mol A, Moser I,  
1020           and Pols J (eds), *Care in Practice: On tinkering in Clinics, Homes and Farms*,  
1021           Bielefeld: Transcript, pp. 57–69.
- 1022   Lemke T. (2015) New materialisms: Foucault and the 'government of things'. *Theory,  
1023           Culture and Society* 32(2): 230-254.
- 1024   Lloyd HG (1983) Past and present distribution of Red and Grey squirrels. *Mammal*

- 1025        *Review* 13(2-4): 69–80.
- 1026 Lorimer J (2007) Nonhuman charisma. *Environment and Planning D: Society and*  
1027        *Space* 25(5): 911–932.
- 1028 Lorimer, J & Driessen, C (2013) Bovine biopolitics and the promise of monsters in  
1029        the rewilding of Heck cattle. *Geoforum* 48: 249–259.
- 1030 Lurz PWW (2014) Changing ‘Red to Grey’: Alien Species Introductions to Britain and  
1031        the Displacement and Loss of Native Wildlife from our Landscapes. In: Convery  
1032        I, Corsane G, and Davis P (eds), *Displaced Heritage: Responses to Disaster,*  
1033        *Trauma and Loss*, Woodbridge, Suffolk, UK: The Boydell Press, pp. 265–272.
- 1034 Lute ML and Attari SZ (2017) Public preferences for species conservation: choosing  
1035        between lethal control, habitat protection and no action. *Environmental*  
1036        *Conservation* 44(2): 139–147.
- 1037 Macpherson J, Bavin D, Croose E, et al. (2014) *Feasibility Assessment for*  
1038        *Reinforcing Pine Marten Numbers in England and Wales*. Ledbury, UK: The  
1039        Vincent Wildlife Trust.
- 1040 Marvin G (2006) Wild killing: Contesting the animal in hunting. In: The Animal  
1041        Studies Group (eds.), *Killing Animals*, Chicago: University of Illinois Press, pp.  
1042        10–29.
- 1043 Marvin G (2010) Challenging Animals: project and process in hunting. In: Pilgrim S  
1044        and Pretty J (eds), *Nature and Culture*, London: Earthscan, pp. 145–162.
- 1045 Mayle BA and Broome AC (2013) Changes in the impact and control of an invasive  
1046        alien: the grey squirrel (*Sciurus carolinensis*) in Great Britain, as determined  
1047        from regional surveys. *Pest Management Science* 69(3): 323–333.
- 1048 McLeod CM (2007) Dreadful/Delightful Killing: The Contested Nature of Duck  
1049        Hunting. *Society & Animals* 15: 151–167.
- 1050 Meurk C (2015) Contesting death: Conservation, heritage and pig killing in far North  
1051        Queensland, Australia. *Environmental Values* 24(1): 79–104.
- 1052 Milton K (2000) Ducks out of water: Nature Conservation as Boundary Maintenance.  
1053        In: Knight J (ed.), *Natural Enemies: People-Wildlife Conflicts in Anthropological*  
1054        *Perspective*, London: Routledge, pp. 229–246.
- 1055 Minter BA (2013) *Refounding Environmental Ethics*. Philadelphia: Temple  
1056        University Press.
- 1057 Nichols CP, Drewe JA, Gill R, et al. (2016) A novel causal mechanism for grey  
1058        squirrel bark stripping: The Calcium Hypothesis. *Forest Ecology and*

1059           *Management* 367: 12–20.

1060 Northern Ireland Squirrel Forum (2016) *The Northern Ireland Squirrel Forum*.  
1061 Available from: [http://www.britishredsquirrel.org/wp-](http://www.britishredsquirrel.org/wp-content/uploads/2016/09/NISF-website-for-British-Red-Squirrels.pdf)  
1062 [content/uploads/2016/09/NISF-website-for-British-Red-Squirrels.pdf](http://www.britishredsquirrel.org/wp-content/uploads/2016/09/NISF-website-for-British-Red-Squirrels.pdf).

1063 Parker M (2007) The cunning dingo. *Society & Animals* 15(1): 69–78.

1064 Patterson ME, Montag JM and Williams DR (2003) The urbanization of wildlife  
1065 management: Social science, conflict, and decision making. *Urban Forestry &*  
1066 *Urban Greening* 1(3): 171–183.

1067 Potts A (2009) Kiwis Against Possums: A Critical Analysis of Anti-Possum Rhetoric  
1068 in Aotearoa New Zealand. *Society & Animals* 17(1): 1–20.

1069 Rapley T (2007) Interviews. In: Seale C, Gobo G, Gubirum JF, et al. (eds),  
1070 *Qualitative Research Practice*, London: Sage, pp. 15–33.

1071 Reeve CL and Rogelberg SG (2005) The Caring-Killing Paradox: Euthanasia-  
1072 Related Strain Among Animal-Shelter Workers '. *Journal of Applied Social*  
1073 *Psychology* 35(1): 119–143.

1074 Ritchie J (1920) *The influence of man on animal life in Scotland*. London: Cambridge  
1075 University Press.

1076 Rollin BE (1987) Euthanasia and moral stress. *Loss, Grief and Care* 1(1-2): 115–  
1077 216.

1078 Royal Forestry Society (2014) *Survey of RFS Members' Views and Experiences of*  
1079 *Grey Squirrel Control*. Banbury, UK: Royal Forestry Society.

1080 Rushton SP, Gurnell J, Lurz PWW, et al. (2002) Modeling impacts and costs of gray  
1081 squirrel control regimes on the viability of red squirrel populations. *The Journal*  
1082 *of wildlife management* 66(3): 683–697.

1083 Scottish Squirrel Group (2015) *Scottish Strategy for Red Squirrel Conservation*.

1084 Sharp RL, Larson LR and Green GT (2011) Factors influencing public preferences  
1085 for invasive alien species management. *Biological Conservation* 144(8): 2097–  
1086 2104.

1087 Sheail J (1999) The grey squirrel (*Sciurus carolinensis*) - a UK historical perspective  
1088 on a vertebrate pest species. *Journal of Environmental Management* 55(3):  
1089 145–156.

1090 Sheehy E and Lawton C (2014) Population crash in an invasive species following the  
1091 recovery of a native predator: The case of the American grey squirrel and the  
1092 European pine marten in Ireland. *Biodiversity and Conservation* 23(3): 753–774.

- 1093 Shuttleworth CM, Lurz PWW and Halliwell EC (eds) (2015) *Shared Experience of*  
1094 *Red Squirrel Conservation Practice*. Warwickshire, UK: European Squirrel  
1095 Initiative.
- 1096 Smout TC (2003) The Alien Species in 20th-century Britain: Constructing a new  
1097 vermin. *Landscape Research* 28(1): 11–20.
- 1098 Srinivasan K (2014) Caring for the collective: Biopower and agential subjectification  
1099 in wildlife conservation. *Environment and Planning D: Society and Space* 32:  
1100 501–517.
- 1101 Srinivasan, K. & Kasturirangan, R. (2017). Conservation and Invasive Species:  
1102 Violent Love. In: Maher J, Pierpoint H and Beirne P (eds) *The Palgrave*  
1103 *International Handbook of Animal Abuse Studies*, London, UK: Palgrave  
1104 Macmillan, pp. 433-452
- 1105 Temple SA (1990) The Nasty Necessity: Eradicating Exotics. *Conservation Biology*  
1106 4(2): 113–115.
- 1107 The Animal Studies Group (2006) *Killing Animals*. Chicago: University of Illinois  
1108 Press.
- 1109 Tompkins DM, Sainsbury AW, Nettleton P, et al. (2002) Parapoxvirus causes a  
1110 deleterious disease in red squirrels associated with UK population declines.  
1111 *Proceedings of the Royal Society of London. Series B: Biological Sciences* 269:  
1112 529–533.
- 1113 Tonkin M, Garritt J, Bryce J, et al. (2016) Red and grey squirrels. In: Gaywood MJ,  
1114 Boon PJ, Thompson DBA, et al. (eds), *The Species Action Framework*  
1115 *Handbook*, Battleby, Perth: Scottish Natural Heritage.
- 1116 Trigger DS, Mulcock J, Gaynor A, et al. (2008) Ecological restoration, cultural  
1117 preferences and the negotiation of ‘nativeness’ in Australia. *Geoforum* 39(3):  
1118 1273–1283.
- 1119 van Dooren T (2011) Invasive species in penguin worlds: An ethical taxonomy of  
1120 killing for conservation. *Conservation and Society* 9(4): 286–298.
- 1121 van Dooren T (2015) A Day With Crows: Rarity, Nativity and the Violent-Care of  
1122 Conservation. *Animal Studies Journal* 4(2): 1–28.
- 1123 Vass G (2016) The story of squirrels (so far) in the UK. *UK Squirrel Accord*  
1124 *Newsletter* 1(4): 2–5.
- 1125 Wales Squirrel Forum (2009) *Conservation Plan for Red Squirrels in Wales*.  
1126 Available from:

1127 [http://www.forestry.gov.uk/pdf/ukrsg\\_Red\\_Squirrel\\_Conservation\\_Plan\\_Wales.p](http://www.forestry.gov.uk/pdf/ukrsg_Red_Squirrel_Conservation_Plan_Wales.pdf/$FILE/ukrsg_Red_Squirrel_Conservation_Plan_Wales.pdf)  
1128 [df/\\$FILE/ukrsg\\_Red\\_Squirrel\\_Conservation\\_Plan\\_Wales.pdf](http://www.forestry.gov.uk/pdf/ukrsg_Red_Squirrel_Conservation_Plan_Wales.pdf/$FILE/ukrsg_Red_Squirrel_Conservation_Plan_Wales.pdf).

1129 Wanderer EM (2014) Biologies of betrayal: Judas goats and sacrificial mice on the  
1130 margins of Mexico. *BioSocieties*, Nature Publishing Group 10(1): 1–23.  
1131 Available from: <http://dx.doi.org/10.1057/biosoc.2014.13>.

1132 Warburton B, Poutu N, Peters D, et al. (2008) Traps for killing stoats (*Mustela*  
1133 *erminea*): Improving welfare performance. *Animal Welfare* 17(2): 111–116.

1134 Watson A and Huntington O (2008) They're here - I can feel them: the epistemic  
1135 spaces of Indigenous and Western Knowledges. *Social & Cultural Geography*  
1136 9(3): 257–281.

1137 Wauters LA, Gurnell J, Martinoli A, et al. (2002) Interspecific competition between  
1138 native Eurasian red squirrels and alien grey squirrels: Does resource partitioning  
1139 occur? *Behavioral Ecology and Sociobiology* 52(4): 332–341.

1140 Wetherell M and Potter J (1988) Discourse analysis and the identification of  
1141 interpretative repertoires. In: Antaki C (ed.), *Analysing Everyday Explanation: A*  
1142 *casebook of methods*, London: Sage, pp. 168–185.

1143 White A, Bell SS, Lurz PWW, et al. (2014) Conservation management within  
1144 strongholds in the face of disease-mediated invasions: red and grey squirrels as  
1145 a case study. *Journal of Applied Ecology* 51(6): 1631–1642. Available from:  
1146 <http://dx.doi.org/10.1111/1365-2664.1227>