

14 **Abstract**

15

16 The surveillance and control of introduced and invasive species has become an
17 increasingly important component of environmental management. However,
18 initiatives targeting 'charismatic' wildlife can be controversial. Opposition to
19 management, and the subsequent emergence of social conflict, present
20 significant challenges for would-be managers. Understanding the substance and
21 development of these disputes is therefore vital for improving the legitimacy and
22 effectiveness of wildlife management. It also provides important insights into
23 human-wildlife relations and the 'social dimensions' of wildlife management.
24 Here, we examine how the attempted eradication of small populations of
25 introduced monk parakeets (*Myiopsitta monachus*) from England has been
26 challenged and delayed by opposition from interested and affected communities.
27 We consider how and why the UK Government's eradication initiative was
28 opposed, focusing on three key themes: disagreements about justifying
29 management, the development of affective attachments between people and
30 parakeets, and the influence of distrustful and antagonistic relationships between
31 proponents and opponents of management. We draw connections between our
32 UK case and previous management disputes, primarily in the USA, and suggest
33 that the resistance encountered in the UK might readily have been foreseen. We
34 conclude by considering how management of this and other introduced species
35 could be made less conflict-prone, and potentially more effective, by
36 reconfiguring management approaches to be more anticipatory, flexible,
37 sensitive, and inclusive.

38

39

40 **Keywords**

41 Invasive species; wildlife management; social conflict; monk parakeet;
42 eradication; United Kingdom

43

44 **1. Introduction**

45 “You probably sense an element of frustration in my voice, ‘cause this
46 stuff’s not new! [Laughs]... Wildlife and space in the city is highly
47 contested, and you need to understand those kind of politics before you
48 start wading in and doing stuff, no matter how well meant it is.”
49 (interview with conservation professional, London, 15/1/15).

50

51 As global biotic exchange continues apace, management of introduced and
52 invasive species has become an increasingly important component of
53 conservation and environmental management (Simberloff et al., 2013).
54 Simultaneously, however, management interventions targeting these species
55 have emerged as new arenas of social contestation, disputes and conflicts
56 (Crowley et al., 2017a; Dickie et al., 2013; Estévez et al., 2015). This contestation
57 and its outcomes develop at the interface of science and politics, and are
58 therefore of interest to both natural and social scientists. While natural scientists
59 working in applied disciplines are perhaps most interested in overcoming or
60 circumventing opposition to deliver management goals (e.g. Blackburn et al.,
61 2010; van Wilgen, 2012), social researchers often focus on exploring the
62 competing aims, knowledges and values underpinning these disputes (e.g.
63 Bhattacharyya et al., 2011; Jeffery, 2014; Porth et al., 2015).

64

65 Introduced species management, like other areas of wildlife management, often
66 includes population reduction through lethal control, which is frequently – and
67 perhaps increasingly – controversial (Bergstrom, 2017; Lute and Attari, 2017; van
68 Eeden et al., 2017).¹ Researchers are therefore increasingly exploring and
69 evaluating public attitudes towards, and the social acceptability of, various wildlife
70 management methods (e.g. Sharp et al. 2011; Dandy et al 2012; Farnworth et al.
71 2014). This line of enquiry has identified and examined some of the beliefs,
72 values and social norms associated with opposition to wildlife management, and
73 can indicate trends in societal attitudes. In practice, however, broader public
74 attitudes may have less influence on the outcomes of management conflicts than
75 the positions and actions of a relatively small number of (often powerful and/or

¹ In the UK alone, as well as chronic conflicts surrounding control of badgers to tackle bovine tuberculosis (Cassidy, 2017), hunting with dogs (May, 2016) and predator control (Marshall et al., 2007), there are also emerging issues surrounding the management of wildlife adapting to urban ecologies, such as foxes and gulls (Carr and Reyes-Galindo, 2017; Cassidy and Mills, 2012).

76 vocal) key actors and interest groups (Crowley et al., 2017b). Consequently, to
77 avoid or mitigate the emergence of destructive social conflicts, it is also important
78 to understand why and how engaged communities and individuals actively
79 oppose wildlife management interventions.

80

81 We conducted a detailed case study of localised conflict surrounding the
82 attempted eradication of monk parakeets (*Myiopsitta monachus*) from the UK, a
83 management project initiated in 2011 but, as of 2017, yet to be successfully
84 completed. We also refer to monk parakeet populations and disputes surrounding
85 their management in the USA. These comparative cases enable us to identify (a)
86 important patterns in the drivers and processes of opposition and (b) alternative
87 management approaches and outcomes that could inform future initiatives.
88 Although we focus on a single species, the findings of this research have not only
89 specific relevance to management of other introduced parrots but also to
90 'charismatic' introduced species more broadly (we discuss the concept and
91 importance of 'charisma' in wildlife in more detail later).

92

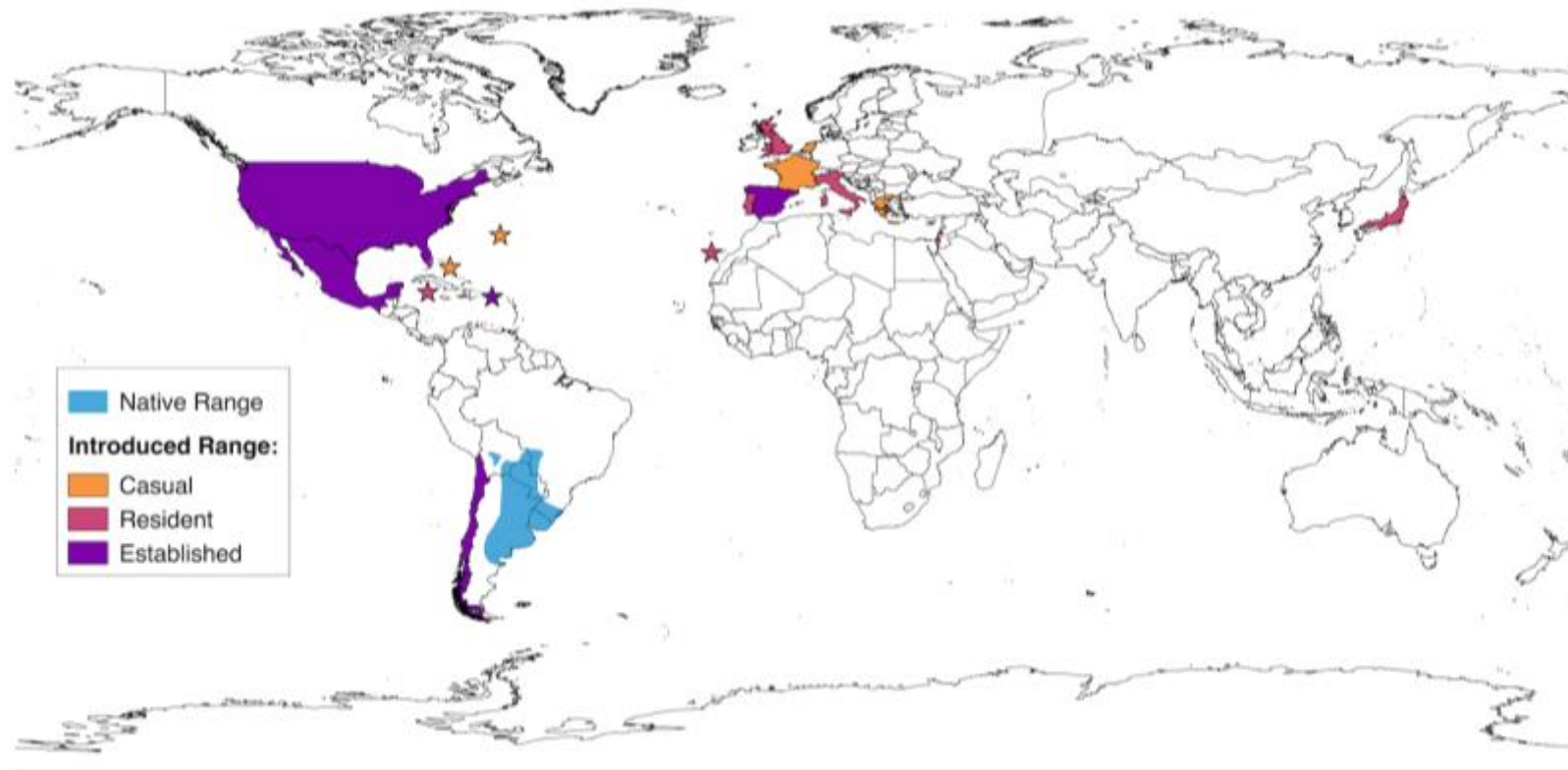
93 We begin with a brief introduction to monk parakeets and their management,
94 followed by our methodological approach. We then provide a chronological
95 summary of the UK case, before turning to the three key drivers of conflict
96 identified in our analysis. We also briefly explore our identification of patterns and
97 connections between management disputes in the UK and USA, including the
98 repeated failure of management initiatives. We conclude by suggesting how
99 adjustments to management approaches could improve the acceptability and
100 effectiveness of parakeet management and, more broadly, how the planning of
101 management projects could be improved by routine, inclusive and explicit
102 assessment of their social implications.

103

104 **1.1. Background: worldwide monk parakeet distribution and** 105 **management**

106 Monk parakeets, the sole member of the genus *Myiopsitta*, are small, green
107 parrots native to central South America. In the latter half of the 20th century, monk
108 parakeets – also known as 'quaker parrots' - were exported in large numbers as
109 part of a booming international trade in exotic pets (Spreyer and Bucher, 1998).
110 Intentional releases and accidental escapes have subsequently resulted in a wide

111 but patchy distribution (Figure 1). Monk parakeets are intelligent birds and exhibit
112 high behavioural plasticity, enhancing their ability to adapt to a range of habitats
113 and climatic conditions (Davis et al., 2013; Hobson et al., 2014). Their success
114 as colonists has also been partly attributed to their tendency, unique amongst
115 parrots, to build large communal nests. These structures reduce their reliance on
116 specific landscape features (e.g. cliffs or tree-holes) and potentially increase their
117 tolerance of cold climates (Spreyer and Bucher, 1998). A flexible, generalist diet
118 enables monk parakeets to exploit a wide range of food sources, including
119 introduced crops (Strubbe and Matthysen, 2009). These adaptive capacities
120 make monk parakeets good contenders for survival and establishment in a range
121 of novel environments. Their overall success has, nonetheless, been variable:
122 whilst there have been notable population expansions in the USA, Mexico and
123 Spain, other populations have been transient or remained restricted to discrete
124 locales. In the colder regions of their introduced range (e.g. Chicago and northern
125 Europe), establishment success has been linked to human population density
126 and other anthropic factors (Davis et al., 2013; Strubbe and Matthysen, 2009),
127 including winter provisioning via bird feeders (South and Pruett-Jones, 2000).



128 **Figure 1: Countries with reported populations of monk parakeets, as at January 2016.**
 129 *Casual: wild populations or individuals occasionally recorded within 10 years, but intermittently or in different locations; Resident: wild*
 130 *populations repeatedly recorded within 10 years, including evidence of breeding, but little/no evidence of spread from area of introduction;*
 131 *Established: wild, breeding populations persisting in multiple locations with evidence of spread from area(s) of introduction. Island*
 132 *populations are marked with stars (Casual: Bahamas, Bermuda; Resident: Canary Islands, Cayman Islands; Established: Puerto Rico).*
 133 *Distribution within countries is often restricted to particular regions: for a comprehensive list of distributions within countries, known historical*
 134 *populations and sources, see Supplementary Data A.*

135 The success of introduced populations is also affected by management activities.
136 Monk parakeet management has two main drivers: precaution and mitigation.
137 Precautionary control of introduced wildlife populations is supported by
138 international agreements such as the Convention on Biological Diversity (CBD:
139 1992), and domestic legislation and conservation guidance arising from them.
140 Precautionary management tends to involve definitive solutions, such as
141 measures to prevent introductions and 'rapid response' eradications, to avoid
142 populations establishing, future introductions and/or problematic environmental,
143 economic or social impacts (Simberloff et al., 2013). In contrast, management as
144 mitigation addresses current, known impacts caused by established populations
145 (including those in the native range). Monk parakeets have incurred locally
146 severe crop damage within their native range in Spain and in Florida (Avery et
147 al., 2006; Canavelli et al., 2013; Linz et al., 2015; Senar et al., 2016). Although
148 they have not yet emerged as serious agricultural pests in the USA (Avery et al.,
149 2006; Pruett-Jones et al., 2011), they have become an economic nuisance as a
150 result of the habit of nesting on electrical utility structures, including poles,
151 transformers and substations (Avery et al., 2006; Burger and Gochfeld, 2009;
152 Minor et al., 2012; Reed et al., 2014). Their large stick-built nests can obstruct
153 routine maintenance and cause transformers to short-circuit or over-heat,
154 disrupting electricity supplies and/or creating a fire hazard (Reed et al., 2014).
155 Monk parakeets' noisy social interactions also mean that some consider them a
156 nuisance, particularly during the breeding season. Mitigation measures include
157 removing problem nests, deterrents and exclusionary devices, structural and
158 habitat modifications to prevent nesting (Burgio et al., 2014), and population
159 control, including trials of the immunocontraceptive 'Diazacon' in Florida (Avery
160 et al. 2008). While various national and regional government authorities have
161 initiated precautionary eradications of parakeets, mitigation activities are primarily
162 undertaken by private property owners or utility companies to protect their
163 services and assets, sometimes with assistance from government agencies.

164

165 **2. Methods**

166 We generated and qualitatively analysed data from multiple sources to build a
167 detailed understanding of the UK case. This included a range of relevant
168 documentation about the dispute, including: publications by campaigners, civil
169 society organisations and the UK Government; minutes of meetings; internal

170 Government correspondence; and national and local media reports. We
171 interviewed seven 'key informants' (Gilchrist and Williams, 1999) in relation to the
172 eradication project: a lead campaigner, a borough ecologist, representatives from
173 two conservation charities, and three civil servants.¹ We chose these detailed
174 methods over surveys of residents and wider constituencies because although
175 this dispute was important enough to significantly disrupt the eradication initiative,
176 in practice it revolved around the interests and activities of a very small number
177 of people: government representatives and agency staff, on the one hand, and a
178 handful of committed campaigners on the other. We were therefore particularly
179 interested in their motivations, perspectives and interpretation of events, and
180 particularly those of campaigners, as our broader question was to understand
181 why and how people might oppose management initiatives of this type.

182

183 Interviews were held, with informed consent, at participants' homes and offices,
184 then recorded, transcribed and analysed. We also visited both current nesting
185 sites and held informal conversations with affected residents. Key informant
186 interviews provide extensive, detailed data for exploring a particular issue or
187 series of events, but these findings should also be triangulated and cross-
188 referenced against other sources (Yin, 2014).

189

190 We conducted additional analyses on a range of sources relating to monk
191 parakeet populations and management outside the UK, which fell into four main
192 categories: (a) academic, peer-reviewed publications; (b) 'grey' literature
193 publications by local and national governments, civil society organisations and
194 campaigner groups; (c) media articles and reports relating to specific
195 management disputes; and (d) informal electronic sources, including email
196 correspondence with managers and campaigners, and public blog and Facebook
197 posts.

198

199 Our inductive analysis involved three stages: first, as our case study was largely
200 retrospective, we wanted to establish what had happened. We therefore
201 constructed a detailed chronology (briefly summarised below) to understand how

¹ Civil servants were unable to discuss the details of the specific case in interviews, and are therefore not quoted here. However, they provided extensive general information about the UK Government's strategy and procedures relating to introduced species.

202 the dispute emerged and developed. Second, we were interested in
203 understanding why and how campaigners, residents and town councils
204 challenged or opposed the eradication project. We therefore coded the reasons
205 campaigners gave for their opposition and sorted these into loose thematic
206 categories. It is important to note that we are not claiming that the views of
207 campaigners were fully representative of the attitudes of their respective
208 communities; although the campaigners themselves believed their view was
209 shared by the majority of residents, we cannot confirm this to be the case. We
210 show below that campaigners *did* generate and demonstrate a level of support
211 from other residents and wider constituencies (many of whom signed petitions,
212 for example). To our knowledge, no residents actively defended the eradication
213 initiative in public fora, although some were evidently supportive as Government
214 agencies were permitted access to control parakeets in a number of properties,
215 and several residents made supportive statements in the media. Many more will
216 have been unaware of, or disinterested in, the dispute. Finally, on recognising
217 connections between this case and others in the USA, we extended our analysis
218 to include the additional sources, looking for similarities and differences between
219 drivers, events and outcomes of management disputes.

220

221 **3. Results and Discussion**

222

223 **3.1. Chronological case outline**

224 Transient populations of monk parakeets may have occurred in the UK since
225 1936 (Parrott, 2013), but statutory interest in managing these populations only
226 arose in 2007/8. Since 2006, all non-native species (introduced through human
227 activity) in the country, and those considered likely to arrive, have been subject
228 to a standardised risk assessment procedure involving expert evaluation of (a)
229 the likelihood of the species' wild establishment and spread, and (b) its potential
230 negative economic, environmental or social impacts. Completed documents are
231 peer reviewed and appraised by a Risk Analysis Panel, then presented to the
232 Non-native Species Programme Board (NNSPB) comprising senior
233 representatives from Government bodies and agencies. The NNSPB considers
234 the risk assessment and other information (e.g. management feasibility, cost)
235 before making recommendations to Government ministers. Two points about the
236 risk assessment process are worth noting here: first, it does not consider any

237 positive impacts an introduced species' presence might have. Second, it does
238 not consider the potential impacts or feasibility of management activities, nor
239 include management recommendations.

240

241 The risk assessment for monk parakeets designated the species a 'medium' risk
242 with 'moderate' potential impacts, based primarily on evidence of damage to
243 crops and artificial structures from the native and the introduced range (GBNNSS,
244 2010a). This assessment, combined with internal institutional assessments of the
245 technical and financial feasibility of removing the small, spatially restricted
246 populations (see below), were key drivers of the UK eradication initiative. There
247 are also other, more general influences on management decisions, which are
248 taken with reference to supranational agreements (such as the CBD) and the
249 national GB Non-Native Species Strategy (Defra, 2008a).

250

251 The two main monk parakeet populations in England are in Borehamwood
252 (Hertfordshire) and the Isle of Dogs (London), which are about 24km apart and
253 are assumed to be distinct. Both groups have lived outside captivity since the
254 early 1990s (Parrott, 2013), and by the early 2000s were reported to be
255 expanding (Tayleur, 2010). Management feasibility trials were discretely
256 conducted by the Government's Animal Health and Veterinary Laboratories
257 Agency (AHVLA)² between 2008 and 2010. Trapping efforts were largely
258 unsuccessful, but shooting (using a specialised ammunition) was found to be
259 reasonably effective (GBNNSS, 2008). The outcomes of these trials were
260 reported to the NNSPB, who recommended that the parakeets should be
261 eradicated as a 'rapid response' precautionary measure. The programme
262 received ministerial approval and began in early 2011. Civil servants consulted
263 with 'stakeholder groups' (GBNNSS, 2010b) – it is not clear, from the information
264 available, which groups these were — and prepared statements for the press
265 should enquiries be made. The project was not publicly announced, but
266 homeowners in the target areas were approached and requested to allow agency
267 staff to conduct management activities (i.e. nest removal, trapping, shooting) in
268 private gardens.

269

² Since restructured as the Animal and Plant Health Agency (APHA)

270 In April 2011, a national newspaper revealed the Government's "secret plans...to
271 exterminate" monk parakeets (Osborne, 2011). The story was picked up by
272 several other news outlets, most of which included extracts from Defra's (the UK
273 Government's Department for Environment, Food and Rural Affairs) press
274 statement:

275

276 "This invasive species has caused significant damage in other countries
277 and we are taking action now to prevent this happening in the UK...We
278 want to get rid of the wild population. There will be trapping, rehoming in
279 aviaries and we will probably have to shoot some as well."

280 ("Defra spokesperson' quoted in Bowcott, 2011)

281

282 The story drew attention in both boroughs with resident monk parakeet
283 populations. Led by a handful of committed individuals, concerned parties then
284 employed a range of techniques to oppose the scheme. In Borehamwood,
285 campaigners corresponded with a local reporter (who regularly published
286 partisan updates on the story) and the animal protection organisation Animal Aid,
287 which helped them organise and promote their campaign. Physical and online
288 petitions against the eradication were set up: ~2,000 signatures were collected
289 from borough residents and presented at the UK Prime Minister's residence.
290 Relations between campaigners and Government deteriorated and became
291 increasingly antagonistic. Campaigners photographed Government agency staff
292 removing nests in camouflage uniforms; allied journalists subsequently published
293 reports labelling them as "overweight soldiers" (Darlington, 2011a) and civil
294 servants as "petty pen-pushers" (Jones, 2011). Shortly thereafter, the
295 campaigner who took the photographs was visited by police officers and
296 threatened with legal action. Borehamwood's campaigners also lent their support
297 to the parallel campaign on the Isle of Dogs, where campaigners additionally took
298 direct action against management attempts. A network of 'parakeet protectors'
299 was set up to 'leaflet' residents, asking them not to co-operate with government
300 agency staff (*The Wharf*, 2011), and "when the man in charge of
301 trapping...come[s] along there is usually a phone call, and we make a bunch of
302 noise, and the birds fly away" (campaigner, Isle of Dogs, quoted by *Bird Toy*
303 *Factory*, 2011).

304

305 Campaigners also lobbied their local governments. In October 2011, two lead
306 campaigners in Borehamwood collaborated on producing a report, written in a
307 semi-academic style, arguing against the eradication. This was submitted to
308 Hertsmere Borough Council, which, in response to residents' concerns, had
309 temporarily withdrawn permission for birds to be shot on public land. The Council
310 requested both campaigners and Defra to submit their arguments to its executive
311 group. Following these representations, the Council resolved to make decisions
312 about parakeet management on public land on a case-by-case basis, but banned
313 shooting "in accordance with the request of the campaigners" (Hertsmere
314 Borough Council Executive Minutes). A similar story unfolded in the Isle of Dogs,
315 where the Tower Hamlets Council, following representations from campaigners,
316 restricted management methods permitted for parakeets on public land (Hayes,
317 2012). This, in combination with private individuals denying access to gardens
318 (where many of the birds were nesting) created significant delays for the project.
319 At the time of writing in 2017, the stalemate continues, but the Government
320 continues to aim for eradication and has since changed the law in a way that
321 improves its chances: The Infrastructure Act (2015) specifically provides
322 Government agencies powers of access to private land for the purposes of
323 removing 'invasive, non-native species'. Exercising these new powers of access
324 is almost certainly the Government's next step; whether and how the project's
325 opponents continue to resist remains to be seen.

326

327 ***3.2. Drivers of conflict***

328 Our analysis identified three important sources of tension between proponents
329 and opponents of management. First, we found disagreement around the
330 justification and necessity of the project, and particularly around whether monk
331 parakeets posed a (significant) threat to their new environment. We demonstrate
332 how opponents and proponents of management used the same evidence base
333 to draw different conclusions about the necessity of management. Second,
334 human relationships with introduced parrot populations are more emotional and
335 complex than cost-benefit analyses and risk assessments suggest. We discuss
336 and provide evidence for important affective factors that drive opposition, and
337 which may be overlooked in formal deliberations. Finally, opponents of
338 eradication in the UK were partly driven by their distrust of, and resentment
339 towards, the Government and their dissatisfaction with the process by which

340 management was planned and delivered. We therefore consider the importance
341 of management process, and the relationships that develop between
342 proponents/agents and opponents of management.

343

344 *3.2.1. Evidence, justification and (in)justice*

345 In their respective written submissions to Hertsmere Borough Council in 2011,
346 both the Government and campaigners drew on international experiences of
347 monk parakeet introductions and management to argue their case. The same
348 pool of information was selectively applied to support different arguments, made
349 possible by extensive variation in the degree and severity of monk parakeets'
350 impact elsewhere, and significant uncertainty around the likelihood of their impact
351 and spread in new regions. Thus, the NNSPB was convinced the threat posed by
352 monk parakeets was sufficient to warrant action, as a result of, "considering all
353 the evidence on the threat they pose to economic interests... and taking a
354 precautionary approach to any potential threat to biodiversity." (Parrott, 2013).
355 Campaigners, however, concluded that: "there is no evidence to justify the cull of
356 parakeets. There is also no evidence to show they are a threat to agriculture or
357 to local wildlife" (campaigner, Borehamwood, quoted in Thain, 2011). Table 1
358 provides a detailed summary of how both parties employed existing evidence to
359 support their respective positions.

360

Table 1. Comparison of Government and campaigner use of evidence in documents submitted to Hertsmere Borough Council for consideration.

The Government submission was presented by the Department for Environment, Food and Rural Affairs (Defra)

Issue	Government submission	Campaigner submission	Notes: use of evidence
Population size and growth	“The population... <u>is not in decline</u> . It has shown sustained overall growth over the years.”	“The tiny population in the UK has been carefully monitored and is known to be in decline.”	Defra’s records show slow but steady population increase in England. The population was recorded to decline following, and likely affected by, management trials.
	“In ... Spain and the USA, their population has grown exponentially once they have become established”	“The climate [in Spain] is different from that of the UK. In New York State, where temperatures are similar to in the UK, observations over the past few years indicate that the populations are either self-limiting or are remaining stable with little increase.”	Populations in southern Spain, particularly Barcelona, have shown rapid expansion, as have populations in Texas and Florida, USA. In northern regions of the USA, population success and growth rates have been more variable.
Risk / evidence of economic impact	“A population of monk parakeets were kept at liberty in Whipsnade Park, Bedfordshire for some time... but had to be recaptured due to them causing “so much damage in orchards for some miles around.”	“Previous populations existing elsewhere in the UK have died out naturally.”	Both statements are supported by historical records from the UK (Tayleur, 2010; Yealland, 1958)
	<p>“Agriculture:</p> <ul style="list-style-type: none"> • Implicated in causing over one billion dollars per annum in damage in native range. • Capable of causing severe local damage in their introduced range: Dade County Florida, more than 30-fold increase in damage where monk parakeets present and estimated revenue loss of \$477 per agricultural acre attributed to monk parakeet.” 	“Dr Gochfeld... wrote “ <i>I have found no evidence that my earlier concerns about its pest status were warranted. This means little or no evidence of major agricultural damage from its native haunts in Argentina and Brazil, nor its adopted lands in Florida and New Jersey.</i> ”	Dr. Gochfeld is an American environmental scientist whose statement of support for removing monk parakeets from the ‘potentially dangerous species’ list in New Jersey, USA, is appended to the campaigner’s submission. The Government submission from Defra contained no references, but the figures provided from Florida and Spain are from Tillman et al. (2000) and Conroy and Senar (2009) respectively.

“Utilities:

- Frequently nest on electrical structures which can cause frequent power outages. This behaviour is observed in every state in the USA where the birds are breeding. Costs for repair estimated to be \$566,000 annually in South Florida or \$551 per incident. Total costs associated with power failures attributed to the Monk Parakeet in 2001 were \$585,000, or \$570 per incident. **NB This impact was not anticipated when the birds first started to breed.**
- The cost to remove both a nest and the birds inhabiting it is estimated at \$1,500 per nest.
- In the USA the cost of nest removal alone to reduce the risk of power outages was estimated to be \$1.3 million to \$4.7 million over a five year period.”

“Monk parakeets have shown their propensity for crop damage in the UK in the past.”

“The Risk Assessment made clear that this species is capable of causing severe local damage to crops”

“This issue is not so applicable here in the UK because of our electricity supply infrastructure; we don't have many pylons in towns and the distribution network in towns is, in the main, below ground. In the US they have a 110v system which necessitates thicker cables and higher currents (more waste heat) with transformers and cables strewn across the local street scene... In Borehamwood we do have telegraph poles for phone lines and the Eruv poles.* There have been no nests on any of these structures in the 18 years feral monk parakeets have lived here.”

“According to Tayleur (2010) there are no reports of agricultural damage by monk parakeets in the UK”

“Few studies provide convincing evidence of widespread agricultural damage. No massive agricultural damage as had been predicted thirty years ago in the US (Spreyer and Bucher 1998).”

Defra's figures can be found in Avery et al. (2008, 2002) based on studies in Florida, USA. The figure provided for per-nest removal is actually “\$415 to \$1,500 per nest” (Avery et al., 2008: 1449). The final estimated cost over five years is also only for Florida.

There is only one record of monk parakeets nesting on infrastructure in the UK, on a mobile phone mast. Both documents acknowledge this.

Tayleur (2010) supports both statements: “In Argentina, the amount of damage caused by Monk Parakeets is *locally severe*, but regionally negligible (Bucher 1992). *Very little empirical evidence exists* that Monk Parakeets are highly destructive agricultural pests and predictions of severe damage to crops in the USA (Davis 1974) appear not to have been borne out (Spreyer & Bucher 1998)... *There are no reports of agricultural damage* by Monk Parakeets in the UK.” (emphases added)

**Risk /
evidence of
environmental
impact**

“Although there is unlikely to be competition with native birds for nesting sites, competition for food may be an issue since monk parakeets are known to dominate feeding areas and act aggressively to competitors”

“[Monk parakeets] do not compete with other species for nesting sites. On the contrary they will happily share their large communal nests with a variety of creatures and have been known to share with bats, opossums and geese (Athan 2007) as well as house sparrows here in the UK. According to the New York Protection of Monk Parakeets Bill (New York State Senate 2011b): *Quaker [monk] parakeets are neither harmful to the environment, nor displaced or been a threat to any native species.*”

The risk assessment states: “Monk parakeets frequently dominate feeding areas (South and Pruett-Jones, 2000) and have been reported to kill native birds (Davis, 1974)” (GBNNSS, 2010a: 1).

The Davis (1974) reference, though widely used, is based on anecdotal reports. No research has investigated monk parakeet resource competition with native species, including the South and Pruett-Jones (2000) paper, which makes no comment as to dominance in feeding areas or interaction with native species.

There are records of monk parakeets sharing nest structures with other species (see Spreyer and Bucher, 1998). Anecdotal reports suggest their interactions with sparrows can be agonistic, however (Freeland, 1973; Wagner, 2012)

**Risk of health
and social
impact**

“Potential for disease transfer both to livestock (e.g. poultry flocks) and humans. In Barcelona, a number of pathogens have been detected in the faeces of feral monk parakeets – *Chlamydophila psittaci*, *Salmonella*, *Campylobacter*, *E. coli* and a number of viruses.”

“...there is no evidence that the droppings of Quakers are more substantial or more infective than those of any native bird species.”

Neither statement refers to external evidence.

* ‘Eruv poles’ and linking wires are structures associated with the creation of an Eruv (an area within which Orthodox Jews are permitted to carry or push objects on the Sabbath).

362 One point of agreement was that the existing small, spatially limited populations
363 of monk parakeets had not yet created demonstrable problems in the UK.
364 Campaigners used this observation to contest Government claims that monk
365 parakeets constitute a significant threat: “These little birds have been in the town
366 for a very long time and they haven't to my knowledge caused any damage to
367 crops or pylons. I believe the reason they haven't is because they won't”
368 (campaigner, Borehamwood, quoted in Darlington, 2011b). However, lack of
369 observed impact was less germane to the Government's case, which approached
370 eradication as a precautionary (rather than a mitigation) measure. The
371 Government argued that “a lack of full scientific certainty about the precise nature
372 of the threat...should not be a reason to delay effective action” (submission to
373 Hertsmere Borough Council). This is an iteration of the ‘precautionary principle’,
374 the power of which lies in its rational proposition that, in the face of uncertainty,
375 acting now to prevent future problems is the least risky, most effective way to
376 proceed (Cooney, 2004). Adherence to the principle promotes a ‘guilty until
377 proven innocent’ approach to introduced species, a term regularly employed in
378 invasion science to advocate stronger biosecurity measures (Davidson et al.,
379 2013; Ruesink et al., 1995). However, the appropriateness of applying the
380 precautionary principle has been challenged when management interventions
381 involve the death or captivity of sentient animals on the grounds of possible future
382 impacts (Simberloff, 2005). Although monk parakeets have demonstrably created
383 economic losses in their native and introduced range (see Table 4.1), no research
384 has directly assessed health or ecological impacts, and there is no substantiated
385 evidence of either having emerged, thus far, in any part of the species' range.
386 Some felt, therefore, that not only was eradication unjustified by current evidence,
387 but that it was also an injustice. The UK's parakeets were being targeted for
388 impacts they had not yet produced, and which Defra could not confidently claim
389 would emerge: “I could understand if they were killing other birds but they live
390 their life and leave others alone” (resident, Borehamwood, quoted in Darlington,
391 2011c).

392

393 The disagreements over management justification identified here can also be
394 understood as divergent assessments of the relative costs and benefits of
395 eradication. For Defra, eradication provides long-term national ‘security’ against
396 the possible spread and potential negative impacts of a non-native species.

397 Resourcing a discrete project with a definitive outcome was preferred over the
398 potentially high costs of ongoing management, should the population expand. It
399 was also argued that eradication was preferable to long-term population control
400 because fewer birds would be killed overall. Campaigners, armed with the same
401 information, argued that the costs of animal suffering and loss of life were
402 disproportionate to the risk: “tragically it seems to be the case that saving costs
403 and time clearly take priority over the lives of these birds” (campaigners, quoted
404 in *The Docklands and East London Advertiser*, 2011). They contended that
405 eradication was a poor use of public money, and disputed the Government’s
406 claim that it provided a definitive solution: “Defra is spending approximately
407 £1,000 per bird for this eradication programme when anyone can still go to a pet
408 shop, buy one and then release it” (as above). As with many issues in this debate,
409 campaigners and Government spokespeople strongly disagreed on this point.
410 However, there was also evidence of more nuanced views among other
411 interested, but less vocal, parties. The borough ecologist, for example, saw value
412 in both arguments, noting that eradication seemed “a very sensible approach if
413 they might cause damage in the future...it’s easier to eradicate them at the
414 moment. By the time they start causing damage, it’s too late.” Yet, he also pointed
415 out that, “if this species is potentially a real problem, then continuing to allow its
416 sale and keeping in captivity...seems absolutely bizarre.”

417

418 Finally, and more difficult to tease out from formal discourse (for reasons
419 discussed in more detail below), some residents felt that the parakeets’ presence
420 brought certain benefits to their boroughs. Indeed, that campaigners went to
421 considerable lengths to defend the parakeets indicates not only that they
422 opposed what they felt was an unjust, unjustified intervention, but also that they
423 wanted the birds to stay, and were dismayed at the prospect of losing them.

424

425 3.2.2. *Affective attachments*

426 We found that the development of affective attachments to introduced
427 populations can be important drivers of opposition. As in other environmental
428 conflicts (see Buijs and Lawrence, 2013; Satterfield, 2002) we found emotional
429 drivers to be intertwined with ‘rational’ argumentation throughout our analysis.
430 For example, there are indications of deep apprehension, and even guilt, felt by
431 eradication proponents concerned about the effects of human-mediated species

432 introductions: “we brought them here...it’s our fault and we are taking the blame
433 for that and we’re trying to fix it” (interview with conservation professional,
434 16/1/15). There is also an emotional element to the ‘sense of injustice’
435 experienced by those who feel management is unwarranted (above). Here,
436 however, we focus specifically on affective responses to parakeet presence, to
437 attend to this comparatively neglected aspect of opposition to wildlife
438 management. In this section, we draw on evidence from both our research in the
439 UK and from discourse surrounding monk parakeet management efforts in the
440 USA (further details of several cases are provided as Supplementary Data). We
441 do this to highlight apparent patterns in people’s responses to both introduced
442 parakeets and the management initiatives targeting them, and to flesh out our
443 proposition of affective attachments.

444

445 We use the term ‘affective attachments’ to describe emotional and material
446 connections that humans can develop with ‘charismatic’ nonhuman animals
447 through repeated positive interactions, and the integration of particular
448 populations and species into individual, community and cultural identities. Monk
449 parakeets are regularly described as a ‘charismatic’ species (e.g. Avery et al.,
450 2006; Parrott, 2013; Simberloff, 2003), a term often used in bioscience and
451 conservation to describe wildlife with “popular appeal”: Lorimer, 2015) (p39).
452 However, few discuss exactly what charisma means or the properties that
453 constitute it. Lorimer (2015, 2007) suggests this nonhuman charisma is neither
454 an inherent characteristic of a species, nor simply a property attributed by
455 humans. Rather, charisma is produced through various forms of encounter
456 between humans and nonhumans. Lorimer outlines a loose, three-part typology
457 of *ecological*, *aesthetic*, and *corporeal* charisma. *Ecological* charisma identifies
458 how human senses and biorhythms intersect with those of other species in ways
459 that make certain wildlife more detectable, recognisable and distinguishable.
460 Monk parakeets are brightly coloured, build obvious nests, and vocalise well
461 within the range of human hearing. *Aesthetic* charisma refers to general species
462 characteristics, including appearance and behaviour that elicit affective
463 responses in humans. Parakeets’ attractive plumage and entertaining social and
464 foraging behaviour can produce positive emotional responses: “if you watch one
465 eating crab apples in the tree, picking them up with its feet and lifting them...they
466 are absolutely endearing, there’s no doubt about it” (interview with conservation

467 professional, London, 12/1/15). The volume, pitch and insistency of the birds'
468 social calls is less well-received, described by some as "screeching" and
469 "bedlam" (UK residents quoted in Whalen, 2013), though others are less troubled:
470 "it might wake you up, but it sounds very nice" (Chicago resident quoted in
471 Brotman (1988)). Aesthetic charisma, then, can vary in relation to parakeet
472 numbers, proximity, time of year, and the disposition or mood of affected humans.
473 *Corporeal* charisma describes the "affections and emotions engendered by
474 different organisms in their practical interactions with humans" (Lorimer, 2007:
475 921). 'Epiphanies', for example, are a manifestation of corporeal charisma:
476 memorable, formative "moments of connection" (2007: 922) with other living
477 organisms. A common affective response to material encounters with parakeets
478 in their introduced range is perhaps best described as 'dissonance': the surprise
479 of encountering an organism out of (expected) place. This dissonance might
480 manifest negatively, as illustrated by those human residents concerned that
481 parakeets don't fit in: "they are a nuisance...an alien species has been introduced
482 and it is not right" (resident, Borehamwood, quoted in Darlington, 2011c). Equally
483 apparent, however, are more positive experiences of dissonance, such as
484 curiosity or wonder arising from encounters with incongruous parakeets:

485

486 "It surprises and delights many observers to find that parakeets aren't
487 entirely confined to warm climates. One cold winter day I went for a walk
488 in Chicago's Hyde Park...Flurries were dusting the deep snow already on
489 the ground...To then see a half-dozen emerald-green birds with lazuli
490 primaries flying around the park was like witnessing apparitions escaped
491 from some travel agency's promotional posters."

492

(Friederici, 2005)

493

494 Monk parakeets also have the capacity to respond to, and probably even
495 recognise, individual humans:

496

497 "The monk parakeets have this thing...if there's not seeds out there, they
498 give me the `YAA YAA YAA' - I mean, they're yelling. It's, like, they know
499 when there's no seeds. They'll tell you,"

500

(Chicago resident, quoted in Janega, 2007)

501

502 "They squeak and squawk in the elm tree in my front yard...Sometimes I'll
503 go out on my porch and squawk back, just to let them know I'm listening.
504 They'll stop, and look at me out of one eye, then the other, and then
505 continue their conversation."

506

('Robin M.', 2014: comment posted to Yelp.com)

507

508 Correspondingly, people also recognise, distinguish and attend to particular
509 birds.¹ For some, their association with parakeets develops into an important part
510 of their identity: they become a self-styled “parakeet protector” (Whalen, 2013) or
511 “parrot trooper” (Brotman, 1988), working to represent their ‘friends’ (Bingham,
512 2006)² in campaigns, legal proceedings and the media. Dedicated ‘parakeet
513 people’ can be found both in the UK and the USA, leading campaigns, conducting
514 research or simply sharing their enthusiasm: in Brooklyn (NY), for example, the
515 local expert leads tourists on regular ‘Wild Parrot Safaris’ (brooklynparrots.com).

516

517 Parakeets also become integrated into the identities of particular communities.
518 Seymour (2013) highlights conceptual links that campaigners make between
519 parrots and certain peoples (e.g. immigrants, cosmopolites) and locales. We also
520 found these links in our analysis, for example: “[Parakeets] are successful
521 Brooklynites, in that they are adaptable, eat a wide variety of foods and like to
522 talk” (resident quoted in Powell, 2006). Identity integration, then, includes
523 parakeets coming to symbolise or encapsulate existing ideas about the defining
524 characteristics of places and people. However, over time parakeet presence can
525 equally *produce*, or at least enhance, identities: “it turned into a Borehamwood
526 thing...in the sense that...they were Borehamwood parakeets, and so the thing
527 about them being *here* was...important” (interview with campaigner,
528 Borehamwood, 17/1/15). In both our UK and wider analyses we found numerous
529 discursive indications of the interweaving of parakeet presence and activity with
530 the self-identification of certain communities. Quotes illustrating this, and other
531 indicators of affective attachments from multiple regions, are presented in Table
532 2. There may also be subtler, less linguistically explicit markers of developing

¹ A striking example of this is the relationship ‘the parrot guy’, Mark Bittner, developed with introduced parakeets (in this case red masked parakeets *Psittacara erythrogenys*) in San Francisco, documented in *The Wild Parrots of Telegraph Hill* (Irving, 2003). Bittner spent many hours feeding and observing the parrots, and acknowledged that he became very attached to them. On the death of one individual, he said: “I had to admit [after that] that I really did love them”.

² Where cross-species friendship is “characterised not (as has traditionally been the case) by the sorts of entities it links but, rather, by a certain quality of being open to and with others” (Bingham 2006, p489).

533 attachments: for example, a colony in San Leon, Texas, inspired the logo of the
534 Railean rum distillery (railean.com); one can buy a t-shirt 'honouring' parakeet
535 colonies in Chicago and Brooklyn (zazzle.com); and introduced colonies in Texas
536 have dedicated Facebook pages where residents report sightings and share
537 stories.³
538

³ Austin (<https://www.facebook.com/MonkParakeetsAustinTexas/>) and Dallas/Fort Worth (<https://www.facebook.com/The-Monk-Parakeets-of-the-DallasFort-Worth-Metroplex-157513654299450/>)

Table 2. Quotes indicating development of personal and community attachments to monk parakeets

Location:	Quote:	Parakeets associated with:	Source:
Brooklyn, NY, USA	<i>"They've been here so long...it's like we grew up with the parrots."</i>	Place (over time) Personal history	Resident quoted in Cohen, (1996)
	<i>"A West Indian-born parks worker...and his fellow laborers hear what sounds like a flock of sea gulls dive-bombing at their heads. The workers instinctively duck and whip-round and look up and see - those crazy green parrots, expertly mimicking the seagull's caw. "Man, they do that a couple times a week just to play with our minds," Joseph said, grinning wide and shaking his head. "They are a crazy bunch of immigrants, those birds."</i>	Positive interactions Cultural symbolism (immigrant community)	Powell (2006)
	<i>"They've been here for 30 years...They're part of the neighborhood."</i>	Place (over time) Community identity	Campaigner quoted in Durkin (2008)
Chicago, IL, USA	<i>"I think of them as my parrots, as does everyone in Hyde Park...Whenever a professor comes in from Europe and I give him a tour of Chicago, I drive by and point out the parrots."</i>	Place (uniqueness) Personal identity	Campaigner quoted by Brotman (1988)
	<i>"The Hyde Park parakeets, miraculously surviving brutal winters, [are] a colorful example of life that adamantly refuses to perish, of the kind of instinct that has made Chicago harsh and great. I actually have never seen one: the possibility that they are made up makes the whole thing even better."</i>	Place (character) Cultural symbolism (resilience)	Hemon (2013: 131)
New Haven, CT, USA	<i>"Denysenko said his dad, Alex, planted the locust in 1966, taking a 4-foot sapling from a family member's home...Alex Denysenko loved the exotic green parrots that squawked around the neighborhood. He would pour sunflower seeds into a bird-feeder and reel it to the middle of the clothesline, attracting the birds. When the trees got big enough, the birds would settle there in large communal nests. Alex Denysenko died three years ago at the age of 98."</i>	Personal history Positive interactions	Bailey (2013)
Yacolt, WA, USA	<i>"I don't know why they chose Yacolt, but they've wakened up this town...this town has become famous...I mean, most people have never even heard of Yacolt. It's not even on the map sometimes."</i>	Place (uniqueness) Community identity	Resident speaking in Driggins (2010)

	<i>"They're more than just birds to us, they're part of our community"</i>	Community identity	Resident quoted in Gilbert (2007)
Isle of Dogs, London, UK	<i>"These birds have been here for years and the locals love seeing them here. They are part of the Island's wildlife and very friendly..."</i>	Place (over time) Positive interactions Community identity	Campaigner quoted in Hayes (2011)
	<i>"People...are quite proud of having the[m]...they feel there's something rather special...birdwatchers come down to see them...I think...there was a feeling of pride that the Isle of Dogs had got this special bird."</i>	Place (uniqueness / character)	Interview with borough ecologist, 12/1/15
Borehamwood, Hertfordshire, UK	<i>"They add a little bit of colour to the environment, it's something a bit out of the ordinary, which brings character to Borehamwood..."</i>	Place (character)	Campaigner quoted in Darlington (2011c)
	<i>"[Many residents] view the birds as an attractive and charming addition to the town and feel they are as much a part of Borehamwood's heritage as the film industry."</i>	Place (character)	Campaigner submission to Hertsmere Borough Council, 2011
	<i>"They are part of the community, people want them to stay, people enjoy looking at them."</i>	Positive interactions Community identity	Campaigner quoted in Darlington (2011d)

540 These associations between people and parakeets can develop latently, without
541 explicit attention or declaration. However, management proposals have forced people
542 to reveal hitherto unspoken attachments, as they realise – and are compelled to
543 articulate – that something they have come to care about is under threat. Actively
544 engaging in protection campaigns has also contributed to the development of
545 attachments. One campaigner in Borehamwood, for instance, had paid little thought
546 to the birds frequenting the garden until informed of their impending removal:

547

548 “Half a dozen parakeets used to sort of swoop into the garden and go onto the
549 trees and then sweep out again, and [I] didn’t think anything more of it. [Some
550 years later] there was a knock at the door...they gave me a letter...to say that
551 [parakeets] were an introduced species and they were a threat, and they
552 wanted to try and eradicate them. And she said ‘would you have traps in your
553 garden?’ I said ‘oh...I’m not sure about that, [I’ll] have to think about it’. And
554 that’s kind of how it all started.”

555 (interview with campaigner, Borehamwood, 17/1/2015)

556

557 Attachment and protectionism are therefore closely interrelated, although one doesn’t
558 automatically signify the presence of the other. For instance, one might appreciate
559 parakeets yet be unconcerned by the prospect of management (e.g. “much as I like
560 the birds, I don’t want them here if they’re going to be a plague”: Chicago resident
561 quoted in Brotman, 1988). Conversely, some people defend monk parakeets against
562 management without having any specific association with them: regional or national
563 animal rights and/or welfare organisations, for instance, have opposed management
564 in the UK, Connecticut and Yaoclt (Washington) on the grounds of more general
565 ethical oppositions to lethal wildlife control and/or the exotic pet trade.

566

567 Whatever the initial drivers, however, defending parrots against management and
568 proactively promoting their safeguarding have drawn protectionists into politico-legal
569 or techno-scientific arenas. In these domains, positions must be rationalised and
570 decisions justified in relation to expert advice and/or quantifiable cost-benefit analyses
571 (Adams, 1997). Consequently, the various components of attachment – affective
572 logics, relationships and identities – become comparatively ineffective, and may be
573 considered illegitimate (Buijs and Lawrence, 2013; Whitney, 2013). Politico-legal
574 protectionism therefore involves translating attachments into resolutely unemotional
575 reasoning. Consequently, over time, “I can’t make a logical argument for keeping

576 them, but I can make an emotional one” becomes, “we will continue to campaign...not
577 for emotional reasons but because their eradication is senseless and unjustified”
578 (same campaigner, Borehamwood, quoted in Darlington, 2011c, and writing in a 2013
579 statement respectively). Campaigners in Borehamwood felt a rationalised approach
580 was the most likely to achieve results:

581

582 “There wasn’t really much point in jumping up and down with placards and
583 shouting and screaming...so the whole approach [was] to try and make a
584 reasoned, sensible argument as to why they were wrong and why it was a
585 waste of money...we wanted to...show that we were serious, and that it was a
586 serious piece of work, and it wasn’t just like...we like them and why get rid of
587 them”

(interview with campaigner, Borehamwood, 17/1/15).

588
589

590 Although employing emotive appeals in publicity statements and materials,
591 campaigners recognised that even though there are multiple reasons for concern
592 about monk parakeet eradication, only some would be considered “serious”.
593 Accordingly, the document that campaigners wrote for Hertsmere Borough Council
594 focused on refuting Defra’s case with evidence and economics, and included little
595 about either affective factors or positive associations between people and parakeets.

596

597 Campaigners in the Isle of Dogs took a more direct approach to opposing
598 management, including the placards and direct action rejected by the Borehamwood
599 contingent, but also made political progress through formal representations to Tower
600 Hamlets Council. Again, the key line of argument was that the threat was overstated,
601 but local councillors also seemed to appreciate the significance of community
602 attachments: “Cllr Khan said we should be proud of them rather than try to destroy
603 them. That was all we were asking for because the people on the Island really love
604 these birds” (campaigner, Isle of Dogs, quoted in Hayes, 2012).

605

606 3.2.3. *Relationships and management process*

607 Despite institutional recognition that an eradication project could generate
608 controversy, the potential strength and power of opposition to management was either
609 severely underestimated or intentionally disregarded by central Government. Internal
610 correspondence indicates that efforts were made, at least with the feasibility trials, to
611 maintain a low profile and avoid public attention. Presumably, this strategy was an

612 effort to avoid conflict, but may have exacerbated it. Campaigners were unhappy that
613 the trials had proceeded in what they felt was an underhand manner, and became
614 distrustful of Government agencies: “I started doing some digging around, and found
615 in 2008 they’d been secretly shooting them...and I thought, I don’t really like this”
616 (interview with campaigner, 17/1/15). Similarly, *The Independent on Sunday* bolstered
617 the drama of their story by “revealing” the Government’s (accessible, but not
618 publicised) “secret” eradication plans (Osborne, 2011). Civil servants had approached
619 specific householders to request permission to access private gardens. However,
620 there does not appear to have been an effective mechanism for engaging broader
621 resident communities and addressing concerns. Campaigner and press enquiries
622 were met with standard lines from an unidentified ‘Defra spokesperson’:

623

624 “We made all these arguments as to why, perhaps, they shouldn’t be doing
625 what they’re doing, and they just didn’t want to know...They were obviously just
626 trotting out the same letters every time...we’d make an argument and they
627 would just write exactly the same thing. Didn’t really feel as though they were
628 engaging in the debate.”

629 (interview with campaigner, 17/1/15)

630

631 Campaigners also suggested rehoming the birds in a local aviary, but this was not an
632 option considered favourable by the Government. Trials had found trapping the birds
633 challenging and there were concerns that rehoming carried the risk of the birds
634 escaping; the Government contended that “it is considered wiser to eradicate invasive
635 species from the wild rather than seek to capture and re-home them” (Defra, 2008b).
636 Consequently, campaigners added feelings of exclusion and disempowerment to their
637 grievances, and challenging the perceived anonymous authoritarianism of the
638 Government became part of their mission:

639

640 *Interviewer:* Why is this so important to you?

641 *Campaigner:* Ultimately it is the birds...because it is nice having them
642 around...[pause] And maybe there’s a little bit of...it’s sort
643 of David and Goliath isn’t it?”

644 (Borehamwood, 17/1/15)

645

646 “My argument is, the sky doesn’t belong to Defra”

647 (campaigner, Isle of Dogs, quoted in Whalen, 2013).

648

649 In their submission to Hertsmere Borough Council, Borehamwood’s campaigners
650 drew on their experiences to cast the Government and its agencies as incompetent
651 and untrustworthy. They highlighted conflicting statements about the project’s aims
652 and whether the birds would be captured or killed. Highly partisan, but nevertheless
653 supported by (selective) references, quotes, appendices and a petition signed by
654 ~4,000 people, this document and presentation was sufficient to convince the Council
655 to prohibit lethal management of monk parakeets on its land. In contrast, Defra’s
656 confident but equally selective submission included no supporting references (relying
657 instead on the assumed legitimacy of the peer-reviewed non-native species risk
658 assessment) and argued that national and supra-national strategies for invasive
659 species management gave it authority to act. In terms of public support, it referred to
660 a national independent survey, which found “broad support for lethal control of non-
661 native species”. However, it made no reference to the specific concerns of the
662 community represented by the councillors receiving the report. Furthermore, “there
663 was no representative from Defra present at the meeting, which [the] chairman...said
664 ‘was a shame and frustrating’” (Thain, 2011). Similarly, in the Isle of Dogs, only
665 campaigners met with councillors to make their case. Arguably, the lack of meaningful
666 dialogue about the issue had damaged the Government’s relationships with
667 concerned citizens and local authorities and, ultimately, the success of its project.

668

669 ***3.3. Networks and patterns in management disputes***

670 Finally, an interesting feature of this case was that, in building a counter-narrative
671 against eradication, campaigners sought out and learned from the experiences and
672 arguments of previous management disputes. Indeed, a loose network of parakeet
673 protectors formed within and between regions, states and nations: Borehamwood
674 campaigners were advised by veteran parakeet advocates from the New York
675 metropolitan area, and went on to support activists in the Isle of Dogs. By comparison,
676 whilst the UK Government has established a strong system for conducting risk
677 assessments for non-native species, drawing on global evidence, there is currently no
678 formal or explicit mechanism for learning about (or from) past management initiatives.
679 This is unfortunate, because monk parakeet management has a documented history
680 of social conflict and unsuccessful interventions. For example, activists in Chicago,
681 Illinois and Yaolt, Washington prevented eradication efforts in the 1980s and 2010s,
682 respectively, and advocates in the New York metropolitan region have additionally

683 campaigned – as yet unsuccessfully - to increase the level of legal protection afforded
684 to monk parakeets (see Supplementary Data). There are commonalities between past
685 disputes that could enable would-be managers to anticipate, and potentially address,
686 social concerns. For instance, disputes have repeatedly arisen in northerly, urban-
687 suburban areas where charismatic parrots have established relatively small
688 populations over several years (and sometimes decades) before being threatened
689 with eradication and/or lethal control.

690

691 **4. Conclusions**

692

693 Although focused on a single species and a handful of cases, the findings of this study
694 are useful in informing future management approaches, both specifically, in relation to
695 introduced monk parakeets, parrots and, more broadly, to other introduced species.
696 First, as noted in a summary report of the UK case, “there appear[ed] to be a lack of
697 understanding, or resistance, to the concept of the precautionary principle – certainly
698 in the case of colourful and charismatic species such as parakeets” (Parrott, 2013:
699 85). We have identified some challenges to application of the precautionary principle
700 in cases such as this, where precautionary action involves lethal control or eradication
701 of charismatic, sentient animals. Indeed, the problem may be compounded in monk
702 parakeet management because the small, locally restricted colonies considered
703 technically eradicable may be the same populations to which humans develop
704 affective attachments. Moreover, where attachments exist, opposition to eradication
705 may be a response to the impending *loss* of parakeet presence, rather than solely (as
706 is often assumed) animal welfare concerns. Finally, in the UK, eradication was framed
707 as a ‘rapid response’ intervention. However, although 20 years – the interval between
708 first records of monk parakeets in southeast England and the eradication project – is
709 considered short in ecological time, this represents almost a generation for humans
710 and provides ample opportunities for individuals and communities to associate with,
711 and form attachments to, ‘charismatic’ introduced wildlife.

712

713 This is not to suggest that precautionary action is not warranted for monk parakeets.
714 Rather, there is room for greater precaution at earlier stages in the introduction
715 process. Measures to prevent introductions of parakeets and other exotic pets involve
716 reducing source populations and preventing releases/escapes. The import of wild-

717 caught parrots has been banned in the USA since 1992 (*Wild Bird Conservation Act*,
718 1992) and in Europe since 2007 (European Commission Regulation No 318/2007).
719 However, many countries – including those that have banned live imports – still permit
720 monk parakeets to be bred and kept in captivity (NB in the USA and Australia
721 restrictions on ownership, breeding and trade vary between states: Moscatello, 2003;
722 Tillman et al., 2000). Robust regulations on domestic parrot trading and ownership
723 may be one means of reducing source populations and propagule pressure, while
724 potentially improving captive animal welfare. Other preventative measures could
725 include establishing clear channels through which people with unwanted exotic pets
726 might surrender them, and enforcement of existing laws relating to the release of non-
727 native species. Whilst not providing ultimate solutions, a greater, more explicit focus
728 on preventative measures would also serve to eliminate some of the inconsistencies
729 (highlighted by campaigners, but agreed on by both conservation professionals and
730 civil servants) in current strategies that focus disproportionately on reactive
731 management. In other words, a joined-up approach could be both more effective and
732 more convincing.

733

734 Similarly, rapid response eradications still have important application to the
735 management of introduced parrots. Such measures may be more acceptable,
736 however, if carried out rapidly in human terms as well as ecological terms (e.g. shortly
737 after detection) and with sensitivity, taking the concerns of affected communities
738 seriously (see also Mackenzie and Larson, 2010). Where ownership remains legal,
739 quickly retrieving and rehoming exotic birds in the same way that authorities might
740 recover escaped pets may be preferable – both socially and in welfare terms – to
741 responding to their presence as an incursion of an invasive species.

742

743 Established populations present a slightly different set of challenges. Where
744 populations are small and localised, eradication may be technically feasible. However,
745 the *social* feasibility of such interventions, particularly when they involve lethal control,
746 may be more limited. In the UK case, the Government does not appear to have
747 accounted for the potential depth and strength of opposition. This reveals an important
748 missing step in the management planning process: explicit assessment of the social
749 impacts and implications of management, and mechanisms for addressing or
750 responding to the concerns of affected communities. We have discussed the potential

751 value of social impact assessments in invasive species management elsewhere
752 (Crowley et al., 2017b) but in brief, we propose that the management of introduced
753 species (like any other form of environmental intervention) can produce both positive
754 and negative social impacts that need to be explored and effectively taken into account
755 in decision-making. Social impact assessment could also help improve relationships
756 between would-be managers and affected communities, provided they incorporate
757 early, good-faith public engagement. The distrustful and combative relationship that
758 developed between Government and campaigners in the UK clearly contributed to the
759 resulting uneasy stalemate, and seeded the potential for the conflict to reignite should
760 the Government reattempt eradication in future. Management disputes in the USA
761 have also become antagonistic at times: campaigners in Connecticut filed a lawsuit
762 when a utility company killed parakeets following nest removal (Harper and West,
763 2010) and state efforts to remove the Chicago population resulted in public protests
764 (Brotman, 1988). Elsewhere, however, more collaborative approaches have emerged.
765 In Edgewater, New Jersey, the state utility company – learning from the experience of
766 their Connecticut counterparts – works with campaigners and researchers to develop
767 and refine impact mitigation measures that minimise the welfare costs of nest
768 “teardowns” (Burger and Gochfeld, 2009). Campaigners maintain a constructive
769 relationship with the company, whose representatives, they claim, have been “very
770 forthright, open, and cooperative” (Edgewater Parrots, n.d.). The issues surrounding
771 impact mitigation and eradication are somewhat different, but protectionists may
772 nevertheless be more open to population removal if they can participate in decision-
773 making processes. It is therefore important that management planning includes
774 spaces and opportunities for open, inclusive exploration of the possibilities and
775 limitations of different management alternatives, including their variable social, legal,
776 financial, and technical feasibility. Thus, there is a need not only for would-be
777 managers to anticipate and understand the concerns of affected communities and
778 interested publics, but also a willingness to take these concerns seriously and adjust
779 management approaches accordingly. The past missteps of others – including ill-
780 considered wildlife introductions and insensitive management interventions – cannot
781 easily be corrected. They do, however, provide opportunities to learn, anticipate,
782 adjust, and prevent history repeating itself.

783
784

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791

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