Received: 16 November 2022 | Accepted: 16 June 2023

DOI: 10.1002/pan3.10519

PEOPLE AND NATURE | BRITISH ECOLOGICAL SOCIETY

RESEARCH ARTICLE

*Cat*egorisation of cats: Managing boundary felids in Aotearoa New Zealand and Britain

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Funding information
Wellcome Trust, Grant/Award Number: 219889_Z

Handling Editor: Sarah Crowley

Abstract

1. Management of domestic and wild animals is an integral part of conservation and is often based on how an animal is categorised. For example, feral cats are often killed, while valued companion cats and native wildcats are protected.
2. Drawing on qualitative research and using the concept of boundary-work, this paper examines the complex categorisation and management of cats within conservation in Britain and Aotearoa, New Zealand (NZ). We examine how, both in theory and in practice, valued companion and wildcats are distinguished from unprotected feral cats, and in-between categories of stray and hybrid cats.
3. We demonstrate that stakeholders draw boundaries between cat categories differently. These differences in boundary-drawing reflect the inherent blurriness of category boundaries, practical challenges and, importantly, differences in values, in particular whether priority is placed on the life of the cat or the cat's potential victim, particularly native or game birds. This can mean that laws outlining protections for specific categories of animals have limited effect if, in practice, those encountering cats draw boundaries differently.
4. This paper also reports on important differences between the two case studies. In NZ, even cat advocates support the humane killing of unambiguously feral cats while this is less true in Britain. Furthermore, due to the nature of the contexts, conservationists in NZ are more inclined to assume that ambiguous cats are feral whereas conservationists in Britain are more inclined to assume that they are wildcats.
5. This paper demonstrates that values not only shape people's perceptions and treatment of animals but also how they draw boundaries between them. This finding may have important implications for understanding other controversies in conservation and animal management.

KEYWORDS
boundary-work, cat, domestic, feral, hybrid, Predator Free 2050, stray, wildlife management

1 | INTRODUCTION

Could you tell the difference between a European wildcat *Felis silvestris*, a tabby domestic cat *Felis catus* and a hybrid of the two at 20 paces? This is a common question for those involved in cat conservation and management in Britain and is not an easy one to answer:

> a lot of things with stripes, we would want to have it in front of us or have really good solid photos of every angle before we were like, right that's of interest, and even then you need to get genetic samples before you can make any sort of decision on that cat […] But it's a lot of work that goes into that and I wouldn't want to be making that decision staring down the barrel of a rifle. (Oliver, conservation practitioner)

Despite Oliver's concerns, such decisions are, literally and metaphorically, made down the barrel of a gun. Similar dilemmas occur in Aotearoa New Zealand (NZ) when a cat has been caught in a live capture trap as part of predator control for conservation and the trapper must decide whether it is someone's pet, a stray cat or a feral cat with no human relationships. Such in-the-field acts of classification are complex and contested.

Drawing on in-depth qualitative research, and using the concept of boundary-work (Gieryn, 1983), we examine how ethical, political and social factors shape classifications of cats in wildlife conservation in NZ and Britain, asking: why do some stakeholders err towards the presumption that ambiguous cats are members of valued categories (wildcats or pets/strays), while others presume ferality? To answer this question, we first provide context on each of our case studies before examining how cat classifications are achieved in theory (i.e. in law) and in practice (i.e. in the field). We conclude by examining key differences and commonalities between the two cases, and what these mean for conservation and animal management.

1.1 | Contribution

Other-than-human animals (hereafter, animals) are regularly classified and ranked according to sociozoologic (Arluke & Sanders, 1996) or zoometric (Braverman, 2017) scales, based on factors such as where they belong (Philo & Wilbert, 2000), their role in society, our relationships with them and their charisma (Lorimer, 2015). These hierarchies are not only between species but also within them (Hovorka, 2019; Palmer et al., 2022) and are inherently political. For example, the classification of animals as 'pests' enables them to be killed more readily than members of other categories (Johnston, 2021a, 2021b; Sutton & Taylor, 2019), reflecting the connections between categorisation and 'killability': the extent to which an animal is treated as sufficiently 'other' that it can legitimately be killed without any real attention or concern, thus justifying mass killing (Haraway, 2008; Schuurman & Dirke, 2020; Sutton & Taylor, 2019). In conservation, differential killability tends to take the form of animals categorised as biodiversity pests (typically non-native and overabundant species) being killed to protect those deemed valuable (typically the native and/or rare) (Lorimer, 2015; Palmer, 2020; Srinivasan, 2014). This approach is not without its critics, and wider debates are occurring about the ethics of culling one species to protect others, and indeed whether biodiversity is sufficiently valuable to justify this killing (Driscoll & Watson, 2019; Rohwer & Marris, 2019; Soulé, 1985; Wallach et al., 2018).

Categories are not fixed: animals may move between them as they physically move between spaces, such as when wild animals move into cities, becoming problematic in the process (Braverman, 2013) or exercise agency, such as when big cats become 'man-eaters' and therefore killable when previously they were protected (Mathur, 2021). Categories also change based on socio-political and geo-temporal contexts, with the status of domestic cats, for example, having shifted over time and place (Crowley et al., 2020; Schuurman & Dirke, 2020). Considerable literature has explored how animals shift in classification and hence in killability (Braverman, 2013, 2017; Hill et al., 2022; Hovorka, 2019; Palmer et al., 2022; Sutton & Taylor, 2019). At the same time, scholars have examined how, even within categories, animals are valued differently, for example, how animal advocates and conservationists value feral cats differently (Johnston, 2021a; van Patter & Hovorka, 2018; Wald & Peterson, 2020). We contribute to this literature by exploring not simply how different stakeholders value feral cats but also how different values can lead to different definitions of categories. We ask: to what extent is ferality, and hence killability, in the eye of the beholder?

To answer this question, we use and extend the concept of boundary-work developed by Gieryn (1983) for exploring how science is distinguished from various forms of non-science. Inherent to the concept is the observation that having one's work defined as science brings numerous advantages, including prestige. For this reason, professional scientists are often eager to demarcate their work from 'non-science', while those on the margins may advocate for having their work classified as science. Despite its origin in science studies, boundary-work has also proved useful for thinking through issues in conservation, for example rehabilitation centres' efforts to distinguish themselves from zoos and other less desirable conservation sites (Palmer, 2020), and how distinctions are made in law and media about which animals qualify as 'pests' (Sutton & Taylor, 2019). We find boundary-work valuable for understanding why stakeholders may be incentivised to define cat categories differently and hence why attempts to legally protect or remove certain types of animals may have limited effect in practice. The case of boundary-work in cat classification may offer important lessons for conservation and animal management more broadly, since cats are by no means the only animal that are classified into more and less valuable categories. Free-living horses, for example, are variously classified as 'wild' or 'feral', with the designation potentially shaping how they are viewed and managed, with 'feral' having 'pestilent undertones whereas "wild" has associations of nobility and romanticism' (Scasta, 2019, p. 172; see also Beever & Brussard, 2000).

Further parallels can be found in other examples of species hybridisations, such as between domestic dogs and their wild relatives (Rutherford, 2018; van Eeden et al., 2019). These hybrids blur the wild/domestic boundary and present problems for conservationists seeking to protect wild canids if, for example, hunters use claims of hybridity to excuse the killing of wolves (or wolf hybrids) (Peltola & Heikkilä, 2018; von Essen, 2017).

1.2 | Cat categories

In both of our case studies, in-the-field decisions are made as to whether a cat is 'feral' or something more valuable. According to Hill et al. (2022, p. 2) feral cats 'are those who for whatever reason are no longer living under human control', yet 'the term is far from benign'. As Johnston (2021a, p. 7) points out, the classification of cats as feral is used to either consign them to a continued feral existence or render them killable through 'exclusionary narratives that construct them as not belonging [in either wild or domestic spaces] and in need of management'. Classifying cats as feral therefore transforms them from pets to pests (Fredriksen, 2016; Hill et al., 2022; Philo & Wilbert, 2000; van Patter & Hovorka, 2018). The term 'pest' is, however, particularly problematic when applied to cats (Section 3.2) and other domestic species that enjoy widespread positive perceptions (e.g. horses (Beever & Brussard, 2000)). Attempts to cull feral cats and horses *as* pests are thus widely met with public concern, as opposed to the typically accepted culling of other (killable) feral animals (Johnston, 2021a).

Further to the feral cat, we discuss two unkillable, protected cat categories in this paper: companion and wildcats. As well as being valued for their close bonds with humans, companion animals are simultaneously property (Fox & Gee, 2019). Meanwhile, although once widespread throughout Britain, wildcats have been decimated through habitat loss and persecution and are now valued and protected for, inter alia, their rarity and nativeness (Kitchener & O'Connor, 2010).

In between are two boundary cats: strays and hybrids. Our NZ case study focuses on strays. NZ's Code of Welfare for Companion Cats (NAWAC, 2018, hereafter the Cat Code), issued under the 1999 Animal Welfare Act, defines three categories of cats: companion, stray and feral. Companions depend on and live with humans, feral cats are completely independent, with strays falling in between, living around centres of human habitation with 'many of their needs indirectly supplied by humans' (NAWAC, 2018, p. 30).

Hybrid cats, discussed in our British case study, arise from interbreeding between domestic and wildcats. While separate species, the domestic cat is descended from the African wildcat *Felis lybica*, domestic and wildcats are capable of interbreeding and producing fully fertile offspring (Ottoni et al., 2017). Hybrids are often considered undesirable by conservationists since genetic purity is a widespread value within biodiversity conservation (Fredriksen, 2016; Rutherford, 2018). Hybrids, like feral animals, are therefore often killed as a way of protecting valued species or ecosystems. There is, however, variation and debate amongst conservationists (Biermann & Anderson, 2017; Palmer, 2020), with hybrids sometimes valued and protected (Palmer et al., 2021).

2 | METHODS

Our NZ material derives from research by AP aimed at understanding what social and ethical challenges lie on the horizon for Predator Free 2050 (PF2050): a government project launched in 2016 to eradicate rats, possums and mustelids from NZ by 2050. Cats are not within PF2050's scope but they were frequently raised by research participants. The material on Britain is drawn from VT's work, which examines domestic and wildcat management as part of wildcat reinforcement/reintroduction programmes in Britain.

2.1 | Case study selection

Undertaking a cross-case analysis highlights issues that cut across contexts as well as illuminating what is locally specific about wildlife management debates (Palmer, 2022). NZ and Britain offer particularly interesting points of contrast given their differing public attitudes towards conservation and animal welfare. Support for invasive species management is mixed in Britain, with some invasive species such as grey squirrels viewed positively (Crowley, Hinchliffe, et al., 2019; Dunn et al., 2018). Given British ecology (Section 4.1), it is unclear whether domestic cat predation harms native wildlife populations (Palmer, 2022). Furthermore, concern for animal welfare and conservation have often gone hand in hand in Britain, for example around the culling of badgers and foxes (Cassidy, 2019), meaning that conservation advocates may oppose cat management. In this context, conservation groups tend not to actively campaign for management of domestic and feral cats (Palmer, 2022).

In contrast, New Zealanders tend to show considerable support for introduced species management, with around 90% of respondents to a 2019 survey agreeing that invasive species should be killed to protect native species (Hughey et al., 2019). While attitudes are mixed when it comes to culling introduced game animals (e.g. deer) and the use of toxins (Nguyen et al., 2022), there is widespread support for culling rodents, mustelids, possums rabbits and, importantly, feral cats (Hughey et al., 2019; Nguyen et al., 2022).

2.2 | Researcher positionality

We (AP and VT) have both attempted to adopt a symmetrical approach in our research by not aligning ourselves with any of the perspectives under investigation (Sismondo, 2010). We acknowledge, however, that achieving a strictly neutral stance is impossible and, as such, seek to make our positionality transparent (Wald et al., 2013). AP's research is funded by Predator Free 2050 Limited, a Crown-owned, charitable company established to help deliver

PF2050. The funder was not involved in shaping the research but this funding connection may have changed participants' willingness to be involved and their responses during interviews. VT's research is funded by the Wellcome Trust, which does not have a vested interest in the research subject. However, VT's previous work (as a veterinary nurse) and previous research (on rewilding) inform her research perspective.

2.3 | Research ethics

This research was approved by the University of Auckland's Human Participants Ethics Committee (UAHPEC23159) and the University of Exeter's CSSIS Ethics Committee (202021-101). All participants were over the age of 18 and gave free, informed written consent. Participation was on the condition of confidentiality, and participants were given pseudonyms aligned with their gender. Reflecting the naming practices of Māori, NZ's indigenous people, Māori participants' pseudonyms are a mixture of Māori and European names. In one case, a quote is left unattributed as this would identify the participant's organisational affiliation. Further detail on participants is included in Supporting Information.

2.4 | Data collection

AP's research involved semi-structured interviews (59 participants, the majority conducted over video calls), in-depth discussions (16 participants), collection of written responses (1), and participant observation of predator control activities. Participants included predator control project managers and staff, critics of predator control, researchers, Māori stakeholders, and others with relevant interests and expertise. Participants were identified through online research, snowballing, and theoretical sampling in which participants were selected for what they would theoretically contribute, ideally providing a new perspective (Orne & Bell, 2015). VT's research involved visits to four wildcat breeding facilities across Britain, semi-structured interviews (26 participants, conducted in-person and over video calls) and collection of written responses (1). Participants were identified through their involvement with species conservation and/or management, whether that be direct involvement in reintroduction projects or indirect involvement via wildlife governance. Participants included conservation communication officers, consultants, practitioners and project managers, policy experts and researchers.

2.5 | Data analysis

Interviews from both research strands were either audio or audio and video recorded and transcribed. Transcriptions were uploaded to qualitative data analysis software (Qualcoder and NVIVO). Analysis was an iterative process. Initially, we coded our datasets separately, coding inductively to draw out latent as well as overt themes (Braun & Clarke, 2019). We then discussed our findings, focusing on overall cat management strategies and related controversies. During these discussions and early writing drafts, questions around ferality emerged as a point of contrast. Analysis was therefore refocused on the categorisation of cats as feral or otherwise, and how feral cats were managed. This involved reanalysing our datasets to explore ambiguity in cat classification, especially as it related to stakeholder values, and how these values influenced cat killability.

3 | STRAY CATS IN AOTEAROA NEW ZEALAND

3.1 | Background

The opening chapter of Marra and Santella's (2016) *Cat Wars*, a provocative book calling for management of outdoor cats to prevent wildlife predation, is titled *The obituary of the Stephens Island Wren*. The chapter describes how the extinction of a unique bird was brought about by descendants of Tibbles, a cat brought to Stephens Island in NZ's Marlborough Sounds by lighthouse keepers. This reflects NZ's use as an exemplar by invasion biologists concerned about the threat that cats and other introduced species pose to biodiversity. Unlike Britain, where species introductions have occurred since at least the Neolithic, c. 6000BP, and where there is little evidence that introductions have led to extinctions (Manchester & Bullock, 2000), unique island ecosystems like NZ's are particularly susceptible to impacts from introduced species (Bellard et al., 2016).

Domestic cats were first brought to NZ in the 1770s, with a feral population established by settlers around 1830 (Langham & Porter, 1991). In 2020 there were approximately 1.2 million companion cats in 41% of households across NZ (CANZ, 2020), which is higher than most other Western countries, including the UK at 27% (PFMA, 2021). Farnworth et al. (2013, p. 34) provided an admittedly 'highly speculative' estimate of 196,000 stray cats in 2013, while feral cats are believed to number in the millions (Forest and Bird, 2022). There is, however, no data on feral cat numbers, and estimates are fraught because population density varies widely (Langham & Porter, 1991; NPCA, 2020).

Feral, stray and owned domestic cats in NZ predominantly predate rats and rabbits (i.e. other non-native animals). They do, however, also predate native bats, birds, reptiles and insects (Farnworth et al., 2013; NZNCMSG, 2020). While not the only significant factor, feral cat predation is thought to have contributed to regional declines or even local extinctions of some native species (Farnworth et al., 2013). In an international survey, New Zealanders were second-most likely, after Australians, to agree that 'cats killing wildlife in cities, towns and rural areas is a serious problem' (Hall et al., 2016). Despite this, the same survey found that two thirds of NZ cat owners reported allowing their cat to roam freely (67%), which was similar to the UK (at 64%) but substantially higher than all other countries and regions surveyed (Hall et al., 2016).

Together, these findings suggest that NZ is a perfect storm when it comes to cat management (Farnworth et al., 2011). In this context, some conservationists have attempted to shift the attitude of the NZ public against cats, most famously economist turned philanthropist Gareth Morgan through his 'Cats to Go' campaign launched in 2013. Despite the title, and some provocative campaign materials (see Marra & Santella, 2016), Cats to Go was not intended to see all cats disappear from NZ. Rather, Morgan proposed that all owned cats be microchipped and that all un-microchipped cats be killed. In ambiguous cases, authorities would err on the side of killing. The campaign did not succeed but, according to some conservationists, it did bring cats to the fore by starting a 'scary conversation' that 'people didn't want to deal with' (Wendy, eradication/biosecurity specialist).

Since the campaign, some local councils have introduced microchipping requirements for cats (e.g. Wellington introduced a bylaw in 2016 (WCC, 2021)). The campaign has not, however, resulted in feral cats becoming an official target of nationwide eradication under Predator Free 2050 (PF2050). Rather, PF2050 targets only rats, possums and mustelids, described as the animals with 'the least friends' (David, eradication/biosecurity specialist) and whose eradication would face 'the least [...] social resistance' (Paul, Mātauranga Māori researcher). Some argue, however, that the scope of introduced animals targeted needs to be expanded, not least due to complex ecological dynamics whereby removing one introduced species can lead to a boom in another (Linklater & Steer, 2018). In particular, some argue that feral cats must be included to plug the 'cat-shaped hole in the Predator Free 2050 plan' (Charlotte, animal welfare advocacy/policy). By contrast, others observe that adding cats to the official PF2050 list would have 'blown it [PF2050] out of the water immediately' (Hannah, council biosecurity).

Despite not being on the PF2050 list feral cats are, in practice, targeted by many pest control professionals in the Department of Conservation, local councils and grassroots conservation organisations, although participants commonly spoke of avoiding reporting cat kill numbers, in contrast to other animals such as rats. As one animal welfare advocate pointed out, 'I've been to enough talks where people were like, no, we won't deal with cats. And we're like, you *are* dealing with cats, though kind of unofficially' (Olivia, animal welfare advocacy/policy).

3.2 | Classification in theory

According to the Cat Code (NAWAC, 2018), feral cats meet the criteria to be defined as pests under the 1993 Biosecurity Act and thus may be killed. Captured stray cats must be placed in the care of an approved organisation (e.g. the Society for the Prevention of Cruelty to Animals (SPCA)), which is obliged to take reasonable steps to identify an owner. If none can be found after 7 days, the organisation may sell, rehome or kill the cat (NAWAC, 2018).

Despite these legally recognised categories, some local authorities have created their own categories for management purposes. In recent Regional Pest Management Plans, Wellington Regional Council and Auckland Council sought to define a new category of cat, the 'pest cat': 'feral and stray cats that are unowned and live independently from people' in Wellington (GWRC, 2020) and, in Auckland, cats lacking a collar or microchip found in ecologically sensitive areas (Russell, 2019). The thinking, according to one council employee, was that for any free-ranging cats posing a threat to native species in an urbanised environment like Wellington or Auckland (NZ's capital and largest city, respectively) you 'couldn't, strictly speaking, say that they're feral' according to the Cat Code given that they live around humans. Both councils concluded, however, that such cats could be defined as pests according to the Biosecurity Act, meaning that ongoing efforts to kill them are legal. In Wellington, the pest cat announcement met with little objection and now features in the Regional Pest Management Plan. In Auckland, however, the backlash led to the renaming of pest cats as 'unowned cats' (Russell, 2019), on the grounds that 'cats and pest, it's just not language that goes together well' (see also Beever & Brussard, 2000), and a change of policy which became 'arguably more constrained than what we had before we put that [pest cat definition] up' (Auckland Council employee). Thus, Wellington successfully, and Auckland unsuccessfully, sought to formally classify some strays alongside feral cats as killable pests.

More subtly defining cats grouped under the stray category has also been proposed by the National Cat Management Strategy Group (NCMSG), which was established in 2014 and includes representatives from government bodies and interest groups (e.g. the SPCA) (NZNCMSG, 2020). The NCMSG proposes to distinguish between stray cats depending on whether they are 'managed' (i.e. fed or otherwise cared for by humans either as 'semi-owned' individuals or as part of a colony) and/or 'socialised' (with unsocialised animals being unaccustomed to humans and showing fearful or aggressive behaviours when captive). In the proposed plan, all companion cats and 'managed' stray cats must be microchipped. If trapped, unsocialised strays that are part of a managed colony should be returned to the colony, while any socialised strays should be rehomed. Under the plan, the only strays to be treated like ferals are those that are both 'unmanaged' (signalled, under the management plan discussed above, by the lack of a microchip) and 'unsocialised' (indicated via behaviour), a narrower categorisation than that of 'pest cat' proposed by local governments in Wellington and Auckland. Importantly, in this framework, the only strays to be treated as killable are those with no care-based relationship with humans and little possibility of such a relationship forming given their lack of socialisation.

3.3 | Classification in practice

As these various efforts to reclassify strays make clear, the debate about cat management in NZ is minimally concerned with what happens to unambiguously feral cats. Rather, 'the stray cat population is really the contentious piece' (Charlotte). Animal welfare advocate Olivia summarised the situation well:

> some of the most vocal people in my experience with cats and these issues around managing the population [...] is the stray cat advocates. [...] This might sound really wrong, not wrong, but I don't think enough people care about feral cats, to be honest with you, in the cat space. I've heard the advocates, they're like, well, those are feral cats. We don't worry about that. [...] And I just think, of course you don't. Because even by definition, there's no relationship with humans. There's no dependence.

The two NZ-focused cat advocates interviewed confirmed that 'what we would ask for in terms of feral cat management [...] is that it is humane' (Dianne) but that they 'don't necessarily have an issue with them [feral cats] being culled' given they genuinely cause ecological damage (Caroline). Of course, stray and companion cats arguably also cause considerable damage in NZ, with provisioning by humans reducing but not eliminating hunting (Farnworth et al., 2013). It would seem that cat advocates have chosen (perhaps pragmatically, in a context where standing up for feral cats would be fraught), to focus on protecting only those cats with whom humans have, or could have, a relationship. Their protection is thus firmly anthropocentric, not aimed at caring for cats themselves but rather the human-cat relationship. They do, however, adopt an expansive view of the stray category and a narrow definition of feral. They argued that 'unless you're in Mackenzie country [an extremely remote area], and you've had to trek for three days with your food on your back and your sleeping bag, you're not running into a feral cat' (Caroline) and objected to the killing of any cat that does not meet this strict definition. They worried, however, that others took a more expansive view of ferality: 'the term feral is creeping in all over the show [...] there are quite a lot of people in urban areas now who consider themselves weekend ecowarriors, and going out killing furry things in the bush is what they do' (Dianne).

From the other perspective, conservationists and trappers confirmed both the accidental trapping of companion cats and the potential for erring on the side of killing in ambiguous cases. Their stories emphasised the numerous challenges to successfully distinguishing cat categories in the field. One challenge cited is the wide-ranging nature of some companion cats (Hall et al., 2016; Kikillus et al., 2017), meaning that trapping, even in conservation reserves, risks catching a companion cat. To mitigate this risk, Nick, a professional trapper, noted that while there are no formal rules around where kill traps can be set, there are 'certain rules that trappers stick to, just to keep their social capital intact': the 'rule of thumb' that he follows is to not place a cat kill trap within 150 m of a dwelling, which derives from regulations around leghold traps (NPCA, 2020). Despite these precautions, accidents do happen. Neil, also a professional trapper, spoke of an incident in which traps were set 300 m from the nearest neighbour's boundary, and yet a companion cat was still caught. This led the cat's owner to pressure the local council about introducing distance-related trapping rules.

Another method for mitigation is to use only live capture traps near dwellings, allowing companion cats to be released. Conservationists flagged difficulties with assessing cats in live capture traps, however, since only about a third of companion cats in NZ are collared. While levels of microchipping in cats may now be around 50% (Sumner et al., 2022), microchip readers are expensive and were described as difficult to use around aggressive, caged cats. While ambiguous cats can be taken to veterinary clinics for assessment, this is time-consuming and potentially challenging: 'when you've got this angry cat in a cage you don't know what to do. You don't really want to put it in the back of your car and drive it to the local vet, which might be quite far away' (Mark, council biosecurity). Trappers therefore tend to rely on behavioural assessment in the field, which some claimed was easy: 'the domestic cat will meow and purr, and a feral cat will literally try to kill itself getting out of the cage' (Christine, conservation hub/network manager). Slater et al. (2010, 2013) have, however, highlighted that interpreting the behaviour of a trapped cat towards an unknown human is an unreliable means of determining whether the cat has a relationship with other humans.

Others admitted that if they catch a cat, it is classified as feral by default (Blair, community conservation trustee). As Sarah (community conservation communications/engagement) noted, some local trappers are 'pretty hardcore of if it hasn't got a collar on, it's gone-burgers. [...] And there's a sort of unspoken agreement amongst serious trapping types that that's what happens'. Other participants indicated that they err on the side of going to a veterinarian or the SPCA in ambiguous cases (Christine), which offers trappers (who are often not specialists in cat behaviour) a level of protection from criticism, a risk which has been identified in other studies (e.g. Johnston, 2022). It should be remembered, however, that someone still needs to 'make a call', and that there can be repercussions even when a decision is carefully considered by an expert. This was articulated by Charlotte, a veterinarian involved in animal welfare advocacy and policy:

> vets have to be very, very careful about what cats they might choose to either euthanise or destroy. And this is a bit of sensitive topic for me because I did destroy one. The person who gave me informed consent to do that—it was sick, couldn't touch it, yada yada—agreed and that was all well and good. Did the procedure and then someone else who thought they had a relationship with the cat made a complaint against me.

As this story indicates, accidentally killing an owned or semi-owned cat is not something that is necessarily taken lightly. Trapper Nick also reflected:

> I don't like much these encounters when you have to deal with cat owners who approach you, who are absolutely understandably heartbroken, but tell you, look, I'm missing my cat, what's happening? Of course, I feel for them, but at the same time I have a job to do, my job is feral cats, and if that cat is running into a cat trap on DOC [Department of Conservation] land I just need poker face, I need to soldier on. But I definitely feel for people.

Others expressed less sympathy, with Murray (community conservation volunteer) arguing that it's 'stiff bickies'[1] if a wandering companion cat is killed, since this is something the owners could have prevented. Sarah even suggested that a way to encourage more responsible cat ownership might be to convey that 'hardcore trappers are trapping every night. If your cat hasn't got a collar on, it might be a casualty'. Placing the onus on cat owners was a common theme amongst conservationists, with numerous calls for cat regulation akin to the Dog Control Act (1996), which places responsibility on owners for roaming or misbehaving dogs. To some extent, then, the argument about cat trapping reflects a disagreement about where responsibility lies: is the accidental killing of companion cats the fault of irresponsible trappers who fail to comprehend the wild and wandering nature of cats (see Crowley, Cecchetti, et al., 2019), or irresponsible owners who force righteous, dedicated conservationists into difficult situations?

4 | HYBRID CATS IN BRITAIN

4.1 | Background

Unlike NZ, Britain has two native felids, one of which is the European wildcat.[2] Feline predation is therefore not new, although some argue that the large numbers and high population densities of domestic cats, and their subtly different prey preferences from wildcats, have created a novel situation in terms of wildlife predation (Palmer, 2022; Széles et al., 2018). Doubt remains, however, as to whether predation by domestic cats is a significant cause of species declines in Britain, beyond specific species (e.g. ground-nesting birds like the Dartford warbler) and contexts (e.g. where homes abut nature reserves) (Palmer, 2022). Of greater conservation concern is the hybridisation of domestic and wildcats (Palmer, 2022; Rowan et al., 2019). VT's participants emphasised that hybridisation has led to the 'genetic dilution' of the wildcat and its functional extinction, as summarised by conservation project manager Ava:

> we have introgressive hybridisation and we have the very worst possible form of introgressive hybridisation which is a *hybrid swarm*. So, we're in the hybrid swarm. Which is a total *cluster fuck*, we could refer to it. *Hybrid soup*[3] [Name] used to call it, but basically it's been going on for so long and is so complicated that we can't really identify F1s and backcrosses,[4] we're way beyond anything like that. (Emphasis added)

As a result of this 'soup', Ava stressed that 'if you just use a catch-all term of 'hybrids' based on what they look like without a genetic score then you're assigning a very wide range of animals there'. That is, as Ava highlights, the term hybrid can relate to an animal that has any mix of domestic and wildcat genes, with the term masking the 'quality' (high or low)[5] of that hybrid.

This classification reflects a pragmatic acceptance of hybrids. Without this level of tolerance, participants suggested that there would be no free-living felids in Scotland that could be classified as wildcats: 'what is out there in terms of those above 75% is open to debate, it is possible that there aren't any out there with much, much greater than 75%'[6] (Arthur, conservation project manager). A certain level of tolerance is also arguably essential since it is thought that a degree of natural hybridisation (i.e. occurring even in the absence of significant human intervention in the landscape) has existed between the African and European wildcats for the duration of their coexistence (Allendorf et al., 2001). Such hybridisation causes problems for establishing the morphological and genetic characteristics of a 'pure' wildcat (Kitchener et al., 2005; Senn et al., 2019). This point was illustrated by Ava asking, 'what is a pure wildcat? They've lived with domestic cats for thousands of years, nobody knows how much hybridization's happened in the past'.

4.2 | Classification in theory and practice

Wildcats are a priority species for conservation in Britain (JNCC, 2007) and are legally protected under the Wildlife and Countryside Act (1981). As pointed out by Grace (conservation communications/community engagement), however, 'there's no legal definition' of a wildcat, which makes protecting them extremely difficult. Meanwhile, feral cats may legally be killed at any time (Aebischer et al., 2011), although they are protected under the Animal Welfare Act (2006), meaning that any such killing must be humane. Again, however, British law does not offer a definition of what constitutes a feral cat (Gosling et al., 2013). To complicate matters further, companion cats are classed as property and therefore protected by property ownership laws. In some circumstances, this protection can extend to stray or even feral cats if they have a relationship with people who, as a result, assume responsibility for them, constituting a form of ownership.

Due to the paucity of legal definitions, determining a cat's category, and hence appropriate management, is fraught, making the practicalities of protecting free-living wildcats extremely complex. As pointed out by participants, 'the wildcat is protected legally [...] but obviously it's very hard to differentiate between a domestic and a wildcat, or a hybrid, it's hard' (Grace) and 'even though it is illegal to kill wildcats, it's almost like a grey area, with the whole wildcat, hybrid, feral' (Ivy, conservation practitioner). Echoing issues surrounding wolf poaching in the face of hybridisation (Peltola & Heikkilä, 2018; von Essen, 2017), Oliver observed that:

> court cases in the past have been tricky because it's almost impossible to, in a court of law, prove that someone has killed a wildcat when hybridisation's at the state it is because when it's a hybrid, it's technically not a wildcat. It's a loophole. It's really grey. They're [wildcats] hard things to protect at the minute.

While calling for better definitions and legislation regarding hybrids and wildcats, participants also called for more legislation surrounding

owned domestic cats, in particular seeking restrictions on allowing cats to roam freely near national parks. They worried, however, about the feasibility of 'telling people what to do with their pets' (Isla, conservation practitioner; see also Palmer, 2022). This situation is further complicated by cat rehoming organisations, which might require that prospective owners be willing to allow their cats to roam (Freya, conservation practitioner) in a context where keeping cats indoors is often viewed as commensurate with poor welfare (Crowley, Cecchetti, et al., 2019; Wald & Peterson, 2020).

In addition, participants called for legislation to enforce participation in 'trap, neuter, vaccinate, release' (TNVR) programmes[7] of feral, stray and farm cats, the latter being cats that are owned but much less closely associated with people than companion cats. There is no legislation making it compulsory for landowners with feral cats living on their property to participate in such programmes and, as participants pointed out, refusal by just one property owner can derail a project (Oliver). Non-participation in TNVR programmes can occur for numerous reasons, including the view that TNVR is inadequate because killing is the only acceptable way to manage feral cats (Palmer, 2022). While conservationists tend to favour TNVR strategies, land managers and gamekeepers often prefer, and employ, lethal control of cats. Gamekeepers frequently frame predation as having a more serious impact than habitat destruction on both the breeding of game birds and the conservation of rare native birds, arguing that conservationists downplay cats' negative effects on conservation (Palmer, 2022). In this context, feral cats are viewed as part of an 'ever-growing suite of predators which we see as doing damage' (gamekeeper cited in Palmer, 2022) and, as such, there may be an incentive to shoot them where possible. Perhaps for gamekeepers, as for many conservationists in NZ, a cat is 'gone-burgers' unless there is unequivocal evidence of its valuable status. Conversely, for conservationists in Britain, TNVR is perceived as a more socially acceptable management method than killing, and is deployed where conservationists fear that culling feral cats would be socially unacceptable (Fredriksen, 2016). In such cases, conservationists are concerned that culling could jeopardise their social licence to operate (Wald & Peterson, 2020) and be open to challenge if someone asserted a relationship to a cat that was ostensibly feral.

Another reason for conservationists' caution is based on the consequences of mistakenly killing a wildcat, or even a hybrid cat, versus the consequences of mistakenly sparing a feral cat. Fredriksen (2016, p. 692) has argued that the case of wildcats in Scotland illustrates how conservation often involves seeking to 'preserve a certain, clearly defined and unchanging version of the valued species', such that hybridity is viewed as undesirable rather than as a creative force for evolution. On the other hand, for some conservationists, at least certain hybrids are valuable (Palmer et al., 2021). Here, hybrids acquire value by virtue of their genes, and their degree of value (spoken of in terms of quality) is proportionate to their percentage of wildcat genes. This focus on genes reflects a specific, genetic interpretation of taxonomy, in contrast to other approaches focusing on factors such as morphology or niche (Zachos, 2016). This focus may have come about both because of the context of widespread hybridisation and the influence of geneticists on wildcat conservation, as was suggested by Ava: 'for others [conservationists] I think them [wildcats] being a genetic wildcat is more important than "does it fulfil the same ecological niche or not." But our project is run by geneticists, so possibly more important to them than to an ecologist'. Ava took a slightly different view herself, arguing that hybrids are valuable in their own right not because of their genes, but because of their adaptability:

> I think the hybrid population should be an important aspect of this [conservation project] because I think if you focus too much on the cats that get released as being the only important thing then you negate all that local adaptation […] It looks a lot like hybrids are probably going to be much better at surviving out there than wildcats might be because we have hybrid landscapes, we have hybrid habitat out there, and hybrids survive in it and wildcats don't.

This view was, however, unusual, with most participants valuing hybrids only because of their genes. In this context, participants spoke of genetic testing as the gold standard for differentiating between domestic, hybrid and wildcats, but pelage scoring (see Figure 1) as necessary in the field where genetic testing is impractical: 'pelage [scoring] is our "we need a tool on the ground" because we can't run around and scan them for genetics' (Oliver). Pelage scoring thus serves as an (imperfect) proxy in the field for assessing wildness and therefore value.

Despite being a field tool, conservation practitioner Oliver emphasised that pelage scoring should be done carefully, not 'staring down the barrel of a rifle'. The implication here is that those likely to be looking down the barrel of a rifle (e.g. gamekeepers) might not, in Oliver's view, take the task of pelage scoring seriously enough. Indeed, conservationists spoke of their attempts to encourage a highly precautionary approach: 'what we've tried to do is try and encourage them [gamekeepers and other land managers or owners] to use precautionary methods whenever possible, so at least if there's something in a cage trap, try and identify what it is and if it has these kind of pelage attributes then let it go' (Ava). There was, however, a sense that this was not easy:

> you try and talk to landowners and gamekeepers about erring on the side of caution and it's tough. You know when you see something, so maybe at night you're on your estate and you're lamping[8] and you're looking for any potential things, let's say it's a grouse moor or whatever, you're shooting anything that eats grouse. At night, you're not going to be able to tell if it's a wildcat or a cat. And I get it. I don't think any of us could tell the difference at night. So, it's tough. (Grace)

Conservationists are thus advocating the exercise of caution and the presumption of value against a backdrop where gamekeepers, land managers and other stakeholders might find it undesirable or

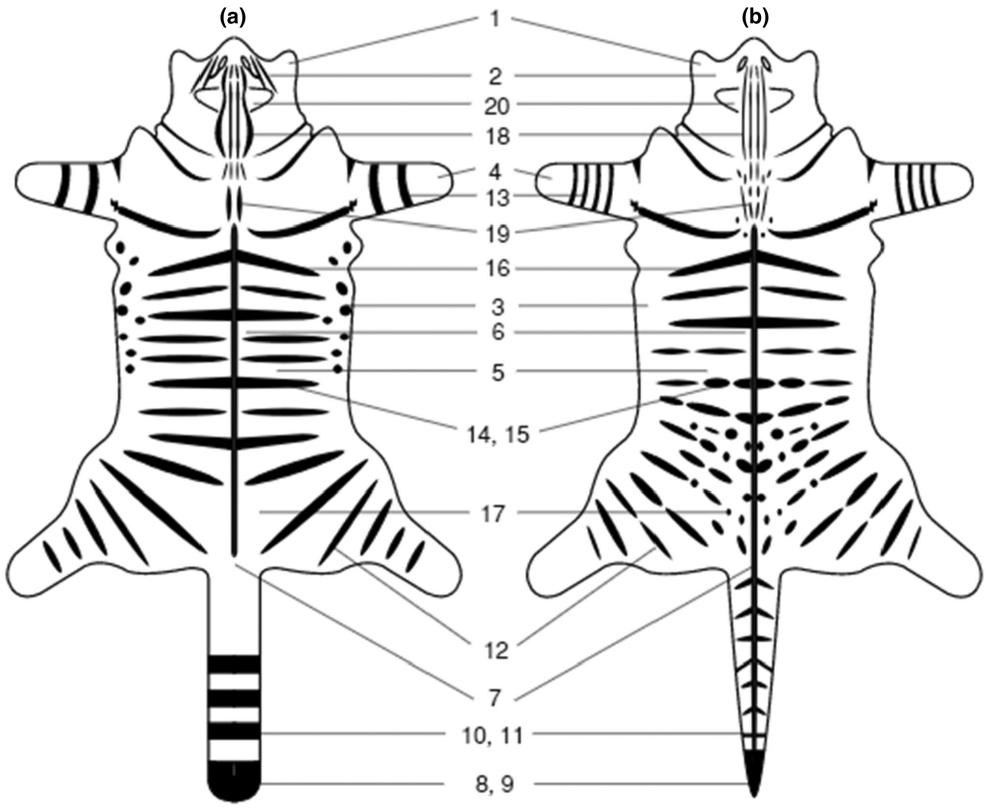

FIGURE 1 Pelage scoring guide for use in differentiating between wildcats (a) and domestic or hybrid cats (b) based on 20 characteristics. (Source: Kitchener et al., 2005, reproduced with permission.)

inconvenient to properly examine a cat's pelage. This stands in contrast to NZ where conservationists tend to presume ferality while other stakeholders (e.g. cat advocates) preach caution. Conservationists' high degree of caution in Britain is particularly interesting given that participants spoke of their scepticism that there were many, if any, free living 'pure' wildcats (or even those with a genetic score of 75% or more wildcat genes).

5 | DISCUSSION AND CONCLUSIONS

To conclude, we reflect on what can be learned from our case studies about cat boundary-work, including how boundaries are drawn differently in theory and in practice, and between different sites and stakeholders (summarised in Table 1). We then suggest how our findings can be extrapolated to apply in other cases of animal classification and management.

A striking point of difference between our cases studies relates to the killability of feral cats. In NZ, cat advocates refrain from speaking up for the unambiguously feral, instead focusing on protecting only those cats that do (or could) have a relationship with humans. NZ cat advocates' retreat to caring about relationships rather than cats in general, as would be more typical of animal advocacy, suggests that feral cats are widely regarded as killable in NZ, by conservationists and wider publics (Hughey et al., 2019; Nguyen et al., 2022). While this killability is not complete (as demonstrated by the objections faced by Auckland Council to their use of the term 'pest cat'), we suggest that feral cats are more killable in NZ than in Britain (sensu Haraway, 2008; see also Crowley et al., 2018). By this, we mean that while feral cats are killed in both places, the killing is considered 'legitimate' in NZ and therefore receives little attention or concern. By contrast, while feral cats are killed in Britain, they are not consistently considered killable (i.e. killing cats is not considered legitimate). Conservationists are therefore sufficiently concerned about public backlash against killing feral cats that they instead opt for TNVR programmes (Fredriksen, 2016). While apparently (mostly) successfully keeping publics and cat advocates on side, this refusal to kill can put conservationists at odds with other stakeholders such as gamekeepers.

Also striking is NZ conservationists' tendency to err on the side of killing while those in Britain err on the side of sparing. This distinction in part reflects feral cat killability, but also relates to the values at play in relation to cats in each case. NZ conservationists, like British gamekeepers, prioritise cats' prey (birds, valued for conservation or hunting) while British conservationists prioritise the interests of wildcats (or, in their absence, wildcat *genes*) and thus err on the side of sparing ambiguous felids. Boundary-work in each country is thus shaped by stakeholders' values, particularly whether their priority is to save cats themselves versus cats' prey and to some extent by broader national cultures about feral cat killability.

TABLE 1 Summary of how cats are classified and managed in theory and practice in Aotearoa, New Zealand and Britain.

	Aotearoa New Zealand	Britain
Theory		
Valued cats	Companion cats are protected, even when roaming on others' property (Cat Code). There are no legal requirements around neutering or preventing roaming. Microchipping is recommended but not mandatory at the national level (Cat Code). Some local councils require microchipping	Companion cats are protected, even when roaming on others' property (Criminal Damage Act 1971) Wildcats are protected (Wildlife and Countryside Act 1981) and are a priority conservation species (JNCC), but there is no legal definition of a wildcat. There is no legal requirement to participate in TNVR programmes aimed at protecting wildcats. Neither are there legal requirements to neuter or vaccinate companion cats or prevent them from roaming
Boundary cats	Trapped strays must be kept by an approved organisation for 7 days to attempt to identify an owner (Cat Code)	Hybrid cats are not classified as wild or domestic and are therefore not protected, but neither is it legally stipulated that they may be killed
Feral and 'pest' cats	Feral cats can be killed (Biosecurity Act 1993) NCMSG proposes differentiating between types of strays, with some (unmanaged, unsocialised) to be treated like feral cats Local councils may develop additional categories of cats (e.g. 'pest cat') that may also be killed under the Biosecurity Act	Feral cats may be killed as long as this is done humanely (Animal Welfare Act 2006), however, there is no legal definition of a feral cat
Practice		
Boundary-work	Conservationists may err on the side of presuming ferality due to practical challenges and values (e.g. the view that owners should prevent companion cats from straying into reserves) Cat advocates consider only cats in the most remote areas as feral. They consider any cat living near human settlements a stray	Conservationists define feral narrowly, seeking, as far as possible, to confirm via pelage scoring and genetic testing that ambiguous felids are neither wild nor 'high-quality' hybrids Other stakeholders (e.g. land owners / managers) may err on the side of assuming ferality and therefore lethal control in ambiguous cases
Killability	Feral cats are widely considered killable, with even cat advocates unconcerned about (humanely) killing unambiguously feral cats	Even feral cats are not widely considered killable, with neutering perceived (by conservationists and publics) as more acceptable than culling
Outstanding issues	Ongoing disputes are around killing of (arguably) stray cats and accidental killing of companion cats	Where a wildcat or valuable hybrid is killed, this is difficult to prove given the difficulty of defining and proving categories and the lack of legal definitions

Boundary-work contributes to the disparity between cat classification in theory and practice in both countries. In Britain, while wildcats are legally protected, this protection is essentially useless in the absence of a clear definition of a wildcat. The ambiguity is in part a product of the genetic continuum between domestic and wildcats. It is also, however, a product of the difficulty of in-the-field classification, which relies on pelage scoring as an (imperfect) proxy for genes, and the reality that for some stakeholders taking the time to trap cats and carefully check their distinguishing features is simply not a priority. Similarly, in NZ, companion and (at least some) stray cats have legal protection but in practice may be killed. This gap between law and practice is, again, a product of genuine category continuity (in this case between feral and stray) and the difficulties of making judgements in the field, where location (e.g. in a conservation reserve or not) and behaviour towards a stranger while trapped in a cage serve as imperfect proxies for assessing a cat's relationship with humans. Alongside this ambiguous evidence is the personal motivation of the trapper, who may not care if stray and even companion cats are killed. Cats that the law intends to protect may therefore be killed, while those that are not legally protected may be spared depending on subjective, in-field boundary-work.

An important question is whether the protections offered in the law could ever be implemented in practice. In NZ, in-field classifications could be rendered less subjective if all companion cats and managed strays were collared or microchipped, though the latter would also rely on conservationists' agreement and ability to use microchip readers in the field. This seems unlikely to be feasible at present, one reason being that cat advocates struggle to get sufficient funding for microchipping strays (Dianne). Alternatively, cat owners could be encouraged to ensure that cats remain on their property. While this solution was popular amongst conservationists interviewed, only a quarter of cat owners living near Wellington's Zealandia sanctuary agreed with this idea in a 2019 survey, suggesting low public acceptance (Woolley & Hartley, 2019). Similarly, in Britain, it seems unlikely that legal protection of wildcats in theory can be extended to the field without a quick, easy and reliable method of differentiating between domestic, hybrid and wildcats. Thus, reducing gaps between law and practice in both countries would require seeking agreement from those involved in cat management to stick to the

letter of the law, despite this potentially bringing difficult practical implications, as well as personal moral implications if they disagree with the law. Perhaps more significantly, it may also require asking stakeholders to reach consensus on what to do in ambiguous cases: whether to err on the side of presumed ferality or otherwise. As we have demonstrated, however, such boundary-work is influenced by different values and, as such, cat classifications are likely to remain fraught for the foreseeable future.

We expect that our case studies can offer insights for cat management in other locations where similar values are imposed on cats, and where debates centre around which cats are, or are not, considered valuable (and are therefore potentially killable or unkillable). Furthermore, we suggest that our work can be useful in other cases of animal management (particularly of 'pest', feral, stray and hybrid animals) where there is debate over the value of animals, the categories they are assigned to, and their treatment as a consequence.

AUTHOR CONTRIBUTIONS

Alexandra Palmer: conceptualization, methodology, validation, formal analysis, investigation, resources, data curation, writing—original draft (Alexandra Palmer led on this), writing—review and editing, supervision, project administration and funding acquisition. **Virginia Thomas**: conceptualization, methodology, validation, formal analysis, investigation, resources, data curation, writing—original draft, writing—review and editing, supervision, project administration and funding acquisition. Both authors gave final approval for publication.

ACKNOWLEDGEMENTS

Alexandra Palmer's research is funded by Predator Free 2050 Limited. Virginia Thomas' research is funded by the Wellcome Trust (grant number 219889_Z). For the purpose of open access, the authors have applied a CC BY public copyright licence to any author accepted manuscript version arising from this submission.

CONFLICT OF INTEREST STATEMENT

The authors have no conflicts of interest to declare.

DATA AVAILABILITY STATEMENT

Data for this article were collected by the authors from semi-structured interviews and in-depth discussions (conducted on-line and in-person), written responses from participants and field notes from participant observation. This data are not publicly available as, in line with ethical approval and participant consent and confidentiality agreements, it has not been archived in a data repository.

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ENDNOTES

[1] Stale biscuits, meaning tough luck, in NZ slang.

[2] The other is the Eurasian Lynx *Lynx lynx*, but it is thought to have been extirpated during the Medieval period and is not discussed in this paper.

[3] 'Hybrid soup' is an informal term used by conservationists to refer to an extensively hybridised population; 'hybrid swarm' is a formal term for such a phenomenon. This participant also uses the term 'cluster fuck' which, while vulgar, has the advantage of operating on more than one level.

[4] F1 is the term used to define the first generation of hybridisation, in this case it would be a cat with one domestic and one wildcat parent (i.e. 50% of its genes are domestic and 50% of its genes are wild). Backcrosses then occur where an F1 hybrid breeds with either a domestic or wildcat.

[5] A 'low quality hybrid' is one with a low proportion of wildcat genes while a 'high quality hybrid' is one with a high proportion of wildcat genes.

[6] Based on genetic markers, cats are given a score between 0 (domestic cat) and 1 (wildcat). A cat with a score of 0.75 or more is deemed a wildcat, and 0.25 or lower as domestic (Senn et al., 2019). Participants discussed this as 'the 75% cut-off'.

[7] This is done specifically to reduce the disease and hybridisation threat that domestic cats pose to wildcats, as well as to reduce feral and stray populations generally (and therefore competition with wildcats for prey and territory).

[8] A method of hunting at night using high powered lights to locate and dazzle quarry.

REFERENCES

Aebischer, N. J., Davey, P. D., & Kingdon, N. J. (2011). Wild cat *Felis silvestris*. https://www.gwct.org.uk/research/long-term-monitoring/national-gamebag-census/mammal-bags-comprehensive-overviews/wild-cat/

Allendorf, F. W., Leary, R. F., Spruell, P., & Wenburg, J. K. (2001). The problems with hybrids: Setting conservation guidelines. *Trends in Ecology & Evolution*, *16*(11), 613–622.

Arluke, A., & Sanders, C. (1996). *Regarding animals*. Temple University Press.

Beever, E. A., & Brussard, P. F. (2000). Charismatic megafauna or exotic pest? Interactions between popular perceptions of feral horses (*Equus caballus*) and their management and research. *Proceedings of the Vertebrate Pest Conference*, *2000*.

Bellard, C., Cassey, P., & Blackburn, T. M. (2016). Alien species as a driver of recent extinctions. *Biology Letters*, *12*(2), 20150623. https://doi.org/10.1098/rsbl.2015.0623

Biermann, C., & Anderson, R. M. (2017). Conservation, biopolitics, and the governance of life and death. *Geography Compass*, *11*(10), e12329. https://doi.org/10.1111/gec3.12329

Braun, V., & Clarke, V. (2019). Reflecting on reflexive thematic analysis. *Qualitative Research in Sport, Exercise and Health*, *11*(4), 589–597. https://doi.org/10.1080/2159676X.2019.1628806

Braverman, I. (2013). Animal mobilegalities: The regulation of animal movement in the American city. *Humanimalia*, *5*(1), 104–135.

Braverman, I. (2017). Captive: Zoometric operations in Gaza. *Public Culture*, *29*(1 (81)), 191–215. https://doi.org/10.1215/08992363-3644457

CANZ. (2020). *Companion animals in New Zealand 2020*. Companion Animals New Zealand Inc.

Cassidy, A. (2019). *Vermin, victims and disease: British debates over bovine TB and badgers*. Palgrave Macmillan.

Crowley, S. L., Cecchetti, M., & McDonald, R. A. (2019). Hunting behaviour in domestic cats: An exploratory study of risk and responsibility among cat owners. *People and Nature*, *1*(1), 18–30.

Crowley, S. L., Cecchetti, M., & McDonald, R. A. (2020). Our wild companions: Domestic cats in the Anthropocene. *Trends in Ecology & Evolution*, *35*(6), 477–483. https://doi.org/10.1016/j.tree.2020.01.008

Crowley, S. L., Hinchliffe, S., & McDonald, R. A. (2018). Killing squirrels: Exploring motivations and practices of lethal wildlife management. *Environment and Planning E: Nature and Space*, *1*(1–2), 120–143. https://doi.org/10.1177/2514848617747831

Crowley, S. L., Hinchliffe, S., & McDonald, R. A. (2019). The parakeet protectors: Understanding opposition to introduced species management. *Journal of Environmental Management*, *229*, 120–132. https://doi.org/10.1016/j.jenvman.2017.11.036

Driscoll, D. A., & Watson, M. J. (2019). Science denialism and compassionate conservation: Response to Wallach et al. 2018. *Conservation Biology*, *33*(4), 777–780.

Dunn, M., Marzano, M., Forster, J., & Gill, R. M. A. (2018). Public attitudes towards 'pest' management: Perceptions on squirrel management strategies in the UK. *Biological Conservation*, *222*, 52–63. https://doi.org/10.1016/j.biocon.2018.03.020

Farnworth, M. J., Campbell, J., & Adams, N. J. (2011). What's in a name? Perceptions of stray and feral cat welfare and control in Aotearoa, New Zealand. *Journal of Applied Animal Welfare Science*, *14*(1), 59–74. https://doi.org/10.1080/10888705.2011.527604

Farnworth, M. J., Muellner, P., & Benschop, J. (2013). *A systematic review of the impacts of feral, stray and companion domestic cats (Felis catus) on wildlife in New Zealand and options for their management*. New Zealand Veterinary Association.

Forest and Bird. (2022). *Time to talk about cats*. https://www.forestandbird.org.nz/resources/time-talk-about-cats

Fox, R., & Gee, N. R. (2019). Great expectations: Changing social, spatial and emotional understandings of the companion animal–human relationship. *Social & Cultural Geography*, *20*(1), 43–63. https://doi.org/10.1080/14649365.2017.1347954

Fredriksen, A. (2016). Of wildcats and wild cats: Troubling species-based conservation in the Anthropocene. *Environment and Planning D: Society and Space*, *34*(4), 689–705.

Gieryn, T. F. (1983). Boundary-work and the demarcation of science from non-science: Strains and interests in professional ideologies of scientists. *American Sociological Review*, *48*(6), 781–795.

Gosling, L., Stavisky, J., & Dean, R. (2013). What is a feral cat?: Variation in definitions may be associated with different management strategies. *Journal of Feline Medicine and Surgery*, *15*(9), 759–764. https://doi.org/10.1177/1098612X13481034

GWRC. (2020). *Pest cats*. https://archive.gw.govt.nz/pest-cats/

Hall, C. M., Adams, N. A., Bradley, J. S., Bryant, K. A., Davis, A. A., Dickman, C. R., Fujita, T., Kobayashi, S., Lepczyk, C. A., McBride, E. A., Pollock, K. H., Styles, I. M., van Heezik, Y., Wang, F., & Calver, M. C. (2016). Community attitudes and practices of urban residents regarding predation by pet cats on wildlife: An international comparison. *PLoS ONE*, *11*(4), e0151962.

Haraway, D. J. (2008). *When species meet*. University of Minnesota Press.

Hill, K., Szydlowski, M., Heaney, S. O., & Busby, D. (2022). Uncivilized behaviors: How humans wield 'feral' to assert power (and control) over other species. *Society and Animals*, *1*, 1–19. https://doi.org/10.1163/15685306-bja10088

Hovorka, A. J. (2019). Animal geographies III: Species relations of power. *Progress in Human Geography*, *43*(4), 749–757. https://doi.org/10.1177/0309132518775837

Hughey, K. F. D., Kerr, G. N., & Cullen, R. (2019). *Public perceptions of New Zealand's environment: 2019*. EOS Ecology. https://researcharchive.lincoln.ac.nz/handle/10182/14097

JNCC. (2007). *UK biodiversity action plan: List of UK BAP priority terrestrial mammal species (2007)*. Joint Nature Conservation Committee.

Johnston, J. J. (2021a). Imposing ferality: A technopolitical analysis of feral and free-roaming animal classification technologies. *Urban Geography*, 1–22. https://doi.org/10.1080/02723638.2021.1985305

Johnston, J. J. (2021b). Incongruous killing: Cats, nonhuman resistance, and precarious life beyond biopolitical techniques of making-live. *Contemporary Social Science*, *16*(1), 71–83. https://doi.org/10.1080/21582041.2019.1667523

Johnston, J. J. (2022). Animal activism, nonhuman charisma, and ethical considerations when working with captive animals and animal agency employees. *ACME: An International Journal for Critical Geographies*, *21*(2), 113–129.

Kikillus, H., Woods, L., Roetman, P., Tindle, H., Litchfield, C., Chiera, B., Quinton, G., Perkins, T., & Kays, R. (2017). *Cat tracker New Zealand: Understanding pet cats through citizen science*. Victoria University of Wellington. http://cattracker.nz/wp-content/uploads/2017/12/Cat-Tracker-New-Zealand_report_Dec2017.pdf

Kitchener, A. C., & O'Connor, T. (2010). Wildcats, domestic and feral cats. In T. O'Connor & N. Sykes (Eds.), *Extinctions and invasions: A social history of British Fauna* (pp. 83–94). Windgather Press. https://doi.org/10.2307/j.ctv13gvg6k

Kitchener, A. C., Yamaguchi, N., Ward, J. M., & Macdonald, D. (2005). A diagnosis for the Scottish wildcat (*Felis silvestris*): A tool for conservation action for a critically-endangered felid. In *Animal conservation forum* (Vol. *2005*, pp. 223–237). Cambridge University Press.

Langham, N. P. E., & Porter, R. E. R. (1991). Feral cats (*Felis catus* L.) on New Zealand farmland. I. Home range. *Wildlife Research*, *18*(6), 741–760. https://doi.org/10.1071/wr9910741

Linklater, W., & Steer, J. (2018). Predator Free 2050: A flawed conservation policy displaces higher priorities and better, evidence-based alternatives. *Conservation Letters*, *11*(6), e12593. https://doi.org/10.1111/conl.12593

Lorimer, J. (2015). *Wildlife in the Anthropocene*. University of Minnesota Press.

Manchester, S. J., & Bullock, J. M. (2000). The impacts of non-native species on UK biodiversity and the effectiveness of control. *Journal of Applied Ecology*, *37*(5), 845–864. https://doi.org/10.1046/j.1365-2664.2000.00538.x

Marra, P. P., & Santella, C. (2016). *Cat wars: The devastating consequences of a cuddly killer*. Princeton University Press.

Mathur, N. (2021). *Crooked cats: Beastly encounters in the Anthropocene*. University of Chicago Press. https://doi.org/10.7208/9780226772080

NAWAC. (2018). *Code of welfare: Companion cats. Issued under the animal welfare act (1999)*. National Animal Welfare Advisory Committee; new Zealand Ministry for Primary Industries.

Nguyen, T., Balanovic, J., Aley, J. P., & Neff, M. B. (2022). Human dimensions of Predator Free 2050: A literature overview of social and behavioural research. *SocArXiv*, https://doi.org/10.31235/osf.io/f98m3

NPCA. (2020). *Feral and stray cats: Monitoring and control, a preliminary guideline towards good practice*. Bionet (Ministry for Primary Industries) and National Pest Control Agencies. http://natlib-primo.hosted.exlibrisgroup.com/NLNZ:NLNZ:NLNZ_ALMA11311687570002836

NZNCMSG. (2020). *New Zealand National Cat Management Strategy Group Report*.

Orne, J., & Bell, M. (2015). *An invitation to qualitative fieldwork: A multilogical approach*. Routledge.

Ottoni, C., Van Neer, W., De Cupere, B., Daligault, J., Guimaraes, S., Peters, J., Spassov, N., Prendergast, M. E., Boivin, N., Morales-Muñiz, A., Bălăşescu, A., Becker, C., Benecke, N., Boroneant, A., Buitenhuis, H., Chahoud, J., Crowther, A., Llorente, L., Manaseryan, N., … Geigl, E.-M. (2017). The palaeogenetics of cat dispersal in the ancient world. *Nature Ecology & Evolution*, *1*(7), 1–7. https://doi.org/10.1038/s41559-017-0139

Palmer, A. (2020). *Ethical debates in orangutan conservation*. Routledge.

Palmer, A. (2022). The small British cat debate: Conservation non-issues and the (Im)mobility of wildlife controversies. *Conservation and Society*, *20*(3), 211–221.

Palmer, A., Skidmore, T., & Anderson, A. (2022). When research animals become pets and pets become research animals: Care, death, and animal classification. *Social & Cultural Geography*, 1–19. https://doi.org/10.1080/14649365.2022.2073465

Palmer, A., Sommer, V., & Msindai, J. N. (2021). Hybrid apes in the Anthropocene: Burden or asset for conservation? *People and Nature*, *3*(3), 573–586. https://doi.org/10.1002/pan3.10214

Peltola, T., & Heikkilä, J. (2018). Outlaws or protected? DNA, hybrids, and biopolitics in a Finnish wolf-poaching case. *Society and Animals*, *26*(2), 197–216.

PFMA. (2021). *Pet population 2021*. https://www.pfma.org.uk/pet-population-2021

Philo, C., & Wilbert, C. (Eds.). (2000). *Animal spaces, beastly places: New geographies of human-animal relations*. Routledge.

Rohwer, Y., & Marris, E. (2019). Clarifying compassionate conservation with hypotheticals: Response to Wallach et al. 2018. *Conservation Biology*, *33*(4), 781–783. https://doi.org/10.1111/cobi.13274

Rowan, A. N., Kartal, T., & Hadidian, J. (2019). Cat demographics & impact on wildlife in the USA, the UK, Australia and New Zealand: Facts and values. *Journal of Applied Animal Ethics Research*, *2*(1), 7–37. https://doi.org/10.1163/25889567-12340013

Russell, A. (2019). Cat concessions on pest control. *Newsroom*, 12 March. https://www.newsroom.co.nz/page/cat-lovers-get-concessions-on-pest-control

Rutherford, S. (2018). The Anthropocene's animal? Coywolves as feral cotravelers. *Environment and Planning E: Nature and Space*, *1*(1–2), 206–223. https://doi.org/10.1177/2514848618763250

Scasta, J. D. (2019). Why are humans so emotional about feral horses? A spatiotemporal review of the psycho-ecological evidence with global implications. *Geoforum*, *103*, 171–175.

Schuurman, N., & Dirke, K. (2020). From pest to pet. Liminality, domestication and animal agency in the killing of rats and cats. *TRACE ∴ Journal for Human-Animal Studies*, *6*, 2–25. https://doi.org/10.23984/fjhas.86934

Senn, H. V., Ghazali, M., Kaden, J., Barclay, D., Harrower, B., Campbell, R. D., Macdonald, D. W., & Kitchener, A. C. (2019). Distinguishing the victim from the threat: SNP-based methods reveal the extent of introgressive hybridization between wildcats and domestic cats in Scotland and inform future in situ and ex situ management options for species restoration. *Evolutionary Applications*, *12*(3), 399–414. https://doi.org/10.1111/eva.12720

Sismondo, S. (2010). *An introduction to science and technology studies* (2nd ed.). Wiley-Blackwell.

Slater, M., Garrison, L., Miller, K., Weiss, E., Drain, N., & Makolinski, K. (2013). Physical and behavioral measures that predict cats' socialization in an animal shelter environment during a three day period. *Animals*, *3*(4), 1215–1228.

Slater, M. R., Miller, K. A., Weiss, E., Makolinski, K. V., & Weisbrot, L. A. M. (2010). A survey of the methods used in shelter and rescue programs to identify feral and frightened pet cats. *Journal of Feline Medicine and Surgery*, *12*(8), 592–600. https://doi.org/10.1016/j.jfms.2010.02.001

Soulé, M. E. (1985). What is conservation biology? *BioScience*, *35*(11), 727–734.

Srinivasan, K. (2014). Caring for the collective: Biopower and agential subjectification in wildlife conservation. *Environment and Planning D: Society and Space*, *32*(3), 501–517.

Sumner, C. L., Walker, J. K., & Dale, A. R. (2022). The implications of policies on the welfare of free-roaming cats in New Zealand. *Animals*, *12*(3), 237. https://doi.org/10.3390/ani12030237

Sutton, Z., & Taylor, N. (2019). Managing the borders: Static/dynamic nature and the 'management' of 'problem' species. *Parallax*, *25*(4), 379–394. https://doi.org/10.1080/13534645.2020.1731006

Széles, G. L., Purger, J. J., Molnár, T., & Lanszki, J. (2018). Comparative analysis of the diet of feral and house cats and wildcat in Europe. *Mammal Research*, *63*, 43–53. https://doi.org/10.1007/s13364-017-0341-1

van Eeden, L. M., Dickman, C. R., Newsome, T. M., & Crowther, M. S. (2019). What should we do with wild dogs? Taxonomic tangles and the management of dingo-dog hybridisation. *Australian Zoologist*, *40*(1), 92–101. https://doi.org/10.7882/AZ.2018.031

van Patter, L. E., & Hovorka, A. J. (2018). 'Of place' or 'of people': Exploring the animal spaces and beastly places of feral cats in southern Ontario. *Social & Cultural Geography*, *19*(2), 275–295. https://doi.org/10.1080/14649365.2016.1275754

von Essen, E. (2017). Whose discourse is it anyway? Understanding resistance through the rise of 'barstool biology' in nature conservation. *Environmental Communication*, *11*(4), 470–489.

Wald, D. M., Jacobson, S. K., & Levy, J. K. (2013). Outdoor cats: Identifying differences between stakeholder beliefs, perceived impacts, risk and management. *Biological Conservation*, *167*, 414–424. https://doi.org/10.1016/j.biocon.2013.07.034

Wald, D. M., & Peterson, A. L. (2020). *Cats and conservationists: The debate over who owns the outdoors*. Purdue University Press.

Wallach, A. D., Bekoff, M., Batavia, C., Nelson, M. P., & Ramp, D. (2018). Summoning compassion to address the challenges of conservation. *Conservation Biology*, *32*(6), 1255–1265. https://doi.org/10.1111/cobi.13126

WCC. (2021). *Microchipping cats*. https://wellington.govt.nz/dogs-and-other-animals/keeping-animals/cat-microchipping

Woolley, C. K., & Hartley, S. (2019). Activity of free-roaming domestic cats in an urban reserve and public perception of pet-related threats to wildlife in New Zealand. *Urban Ecosystem*, *22*(6), 1123–1137. https://doi.org/10.1007/s11252-019-00886-2

Zachos, F. E. (2016). *Species concepts in biology: Historical development, theoretical foundations and practical relevance*. Springer.

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

Data S1: Supporting Information.

How to cite this article: Palmer, A., & Thomas, V. (2023). *Cat*egorisation of cats: Managing boundary felids in Aotearoa New Zealand and Britain. *People and Nature*, *00*, 1–13. https://doi.org/10.1002/pan3.10519