

Animal welfare and ecology in the contested ethics of rodent control in Cape Town

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Abstract

There is growing concern globally about the inhumane treatment of ‘pest’ animals, including rodents, and about the ecological consequences of rodenticides, notably the poisoning of non-target wildlife like raptors and scavengers. Recent contestation between Environmental Health (EH) officials in Khayelitsha, Cape Town’s largest African township, and the National Council for Societies for the Prevention of Cruelty to Animals (NSPCA) illustrates the tension that can arise between innovative ecologically-focused strategies and existing legislation and animal protection practices. In 2013/14 EH officials introduced a job-creation project to trap and drown rats, describing it as ‘humane’ because it avoided poison thereby posing no danger to wildlife such as owls. The NSPCA, however, halted the project, arguing that drowning was both inhumane and illegal. Death by poison is also inhumane but the South Africa’s Animals Protection Act (1962) allows it (and trapping and hunting) to be used against ‘pests’/‘vermin’. The NSPCA, which has never challenged the Act for allowing the inhumane treatment of these animals, used it to trump local preferences. A representative survey from Khayelitsha showed that there was some support for an NSPCA-like position (14% thought that drowning was cruel and that workers should not be allowed to trap and drown rats) but that the majority (70%) indicated that they were both concerned about the poisoning of non-target animals and supported the continuation of the trapping and drowning project. This was not a contestation over whether animals should be protected, but over how to do this, and which animals to include.

Key words: animal welfare, rodenticide, Cape Town, drowning, animal ethics, wildlife control

Introduction

Rats are seen as ‘pest’ animals (or ‘vermin’) globally because of the damage they do to infrastructure (through gnawing and burrowing) and to stored food, and because of the potential health risks they pose to humans (Begon 2003; Bonnefoy, Kampen, and Sweeney 2008; Taylor et al. 2008; Julius et al. 2012; Himsworth et al. 2013a; Archer et al. 2017). Cape Town, like most cities, uses poison (rodenticides) to control rats because when sustained and well-targeted, rodenticides can significantly reduce urban rat populations (Buckle and Smith 2015). Yet rat populations can recover quickly

(Easterbrook et al. 2005; Singleton et al. 2010; Gras, Patergnani, and Farina 2012) and there is growing international concern about the accidental poisoning of non-target animals and the secondary poisoning of predators and scavengers by rodenticides (Eason and Spurr 1995; Thorsen et al. 2000; Brakes and Smith 2005; Rattner and Mastrotta 2018; Serieys et al. 2019). There is also growing pressure for pest management to adopt more humane methods, including shifting away from rodenticides because they cause painful and often protracted, death (Ludders et al. 1999; Edelman 2002; Mason and Littin 2003; Littin et al. 2004, 2014; Meerburg, Brom, and Kijlstra 2008; Yeates 2010; Hadidian 2015).

This paper discusses an attempt in 2014/15 by Environmental Health (EH) officials in Khayelitsha, Cape Town, to move away from rodenticides by implementing a job-creation project that hired previously unemployed people to trap and drown rats. This project, however, was halted after EH officials were instructed by the National Council for Societies for the Prevention of Cruelty to Animals (NSPCA) to stop drowning rats. The NSPCA is the legislated authority in terms of the SPCA Act (no 169 of 1993) for the enforcement of the Animals Protection Act (no 71 of 1962). Faced with the threat of legal action from the NSPCA, EH officials switched back to offering affected households a choice between snap traps and, the more popular option, anticoagulant rodenticides. We argue that the NSPCA's action was ethically complicated because: (i) in the absence of alternative poison-free approaches, it resulted in the re-introduction of poison-based strategies with their attendant adverse consequences for non-target animals and the wider ecology; (ii) there is no reason to suppose that death for the rat by poisoning is better than drowning and (iii) the NSPCA's actions trumped local preferences for poison-free approaches, including protecting non-target animals.

There are competing notions globally of what it means to be 'humane' toward problem urban animals (Hadidian 2015: 1101–1103). The extent to which city rodent management strategies are shaped by rival understandings of the humaneness of their methods and whether these extend only to the target animal or include animals within the wider food chain, is under-researched. Policy approaches are likely to be a function of historical practices (as embedded in legislation), economic considerations (the cost-effectiveness of alternative strategies) as well as pressure from animal welfare organizations, ecologists and wildlife organizations. There is some research on the role of animal welfare organizations and the power of agricultural interests in shaping animal welfare legislation in the USA (e.g. Allen 2005; Lutz and Lutz 2011) but we are unaware of any studies pertaining to the role of animal welfare organizations in shaping rodent control policy. Our discussion of the policy contestation in Cape Town, South Africa is thus most likely the first of its kind.

Methods

Sociologists of knowledge have long pointed to the plurality and contextual nature of specific 'knowledges' or understandings (Mannheim 1936; Merton 1968; Burke 2000). We approach the specific conflict between EH officials and the NSPCA in this light whilst emphasizing the institutional and legal context as an important factor shaping emergent understandings and strategies. Inter-disciplinary policy science provides a useful framework for this discussion. Lasswell (1956) distinguished between various elements of government decision-making processes including: intelligence (gathering information); promotion (persuasion); invocation (initial testing) and prescription (stabilization of norms, including their codification in legislation). In the case presented here, we show that EH officials piloted a novel, low-cost, poison-free rodent control program (invocation and promotion) which collected data (intelligence) but failed at prescription because the underlying notion of humane treatment was contested by the NSPCA.

Clark and Wallace (2015) expand Lasswell's approach to include inter-disciplinary investigation of the values and strategic interests of the various players and recommend that analysts of policy processes clarify their own standpoint or positionality. In this regard, our interest in the contestation was an academic

one: we were intrigued by the clash between the NSPCA's approach to animal welfare and the City's broader or more ecological understanding. We conducted interviews with the key role players on both sides and took field notes. Discussions with EH officials about a potential solution to the conflict (to supply the captured rats to a raptor rehabilitation center where they could be euthanized rather than drowned) allowed us to benefit from participant observation and to learn about the motivations of EH officials pertaining to animal welfare. We showed earlier drafts to the key role players in the EH and the NSPCA and took their comments into account.

We conducted a representative survey in 2017/18 of people living in Site C, Khayelitsha (CSSR and iCWild 2018) to explore attitudes toward animal welfare and rodent control. Figure 1 shows the location of the sample. According to the 2011 population census, 391 749 people live in Khayelitsha, almost all of whom are Xhosa-speaking Africans. Khayelitsha comprises 28 'sub-places' of which Site C, also known as Ikwezi Park, is the closest to Cape Town and the biggest (with 52 184 people). Interviews were conducted in Xhosa and the first adult person encountered in the household was selected for interview. People were generally keen to talk about their experiences and problems with rats and only one household declined to participate in the study.

Using the 'small areas' demarcated by the 2011 census as the primary sampling unit, we drew a stratified two-stage random sample of 222 households. The sample was stratified by whether the small area contained housing that had been planned (formal housing on cadastres) or was informal (no cadastres) and typically shack settlements. The households within each small area were the secondary sampling units. Design probability weights (the inverse of the probability of each respondent being in the sample) were used to adjust the analysis so that conclusions can be generalized to people living in Site C. The size of the estimation sample, using these design weights, was 46 666, which has good agreement with the census. It is, to the best of our knowledge, the first representative (and open access) survey of rodent infestation and control in Cape Town. The dataset is available for downloading through the University of Cape Town's 'DataFirst' facility (CSSR and iCWild 2018). Ethics approval for the survey was obtained through the University of Cape Town's Research Ethics Committee (REC/2017/03/001 and REC/2018/02/006).

For the multivariate analysis, we use Stata 15.1 to run probit regressions on a binary variable taking the value of 1 if respondents thought that council workers should be allowed to set cage traps and drown rats. Following Williams (2012) we calculate and present average marginal effects rather than marginal effects at the mean. Following Benjamin et al. (2018), we report results as statistically significant only if the *P*-value is at or below the 0.005 level and results as statistically suggestive for *P*-values at or below 0.05. Wald tests and *k*=5 crossfold estimates of the out-of-sample error are provided.

Rats, poison and policy contestation in Cape Town

Rodent control in Cape Town has long been a political issue bound up with racial oppression and socio-economic inequality. When the third great pandemic of bubonic plague reached Cape Town in 1900, fear of disease intersected with colonial racist ideology to prompt and justify racial segregation (Swanson 1977; Poleykett 2017). Yet despite oppressive management of both rats and people, rats retained a firm foothold in the city.

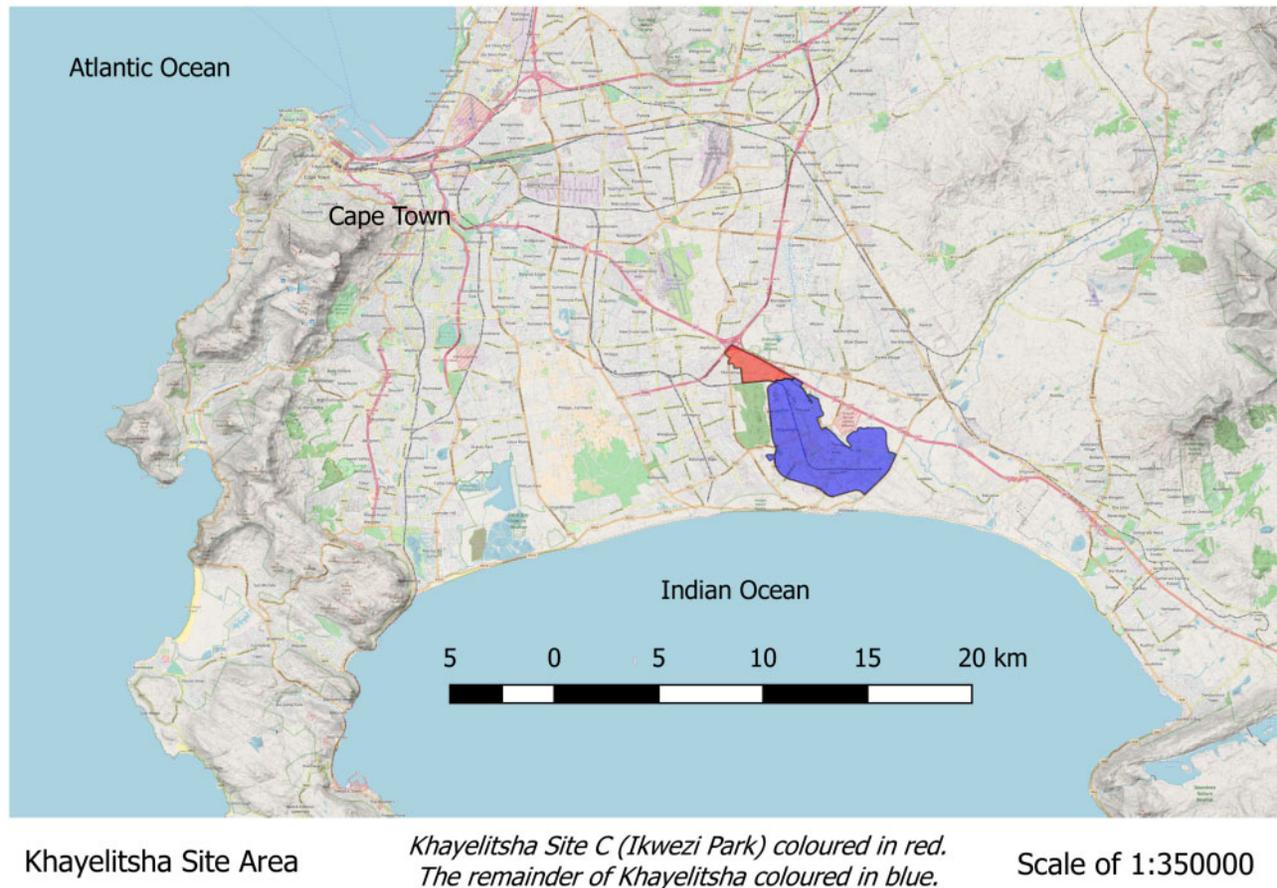


Figure 1: Site C, Khayelitsha (Cape Town). [Map produced by Jed Stevens using OpenStreetMap (OpenStreetMap contributors 2018).]

Rodent populations can grow quickly when conditions are propitious, especially food supply (Singleton et al. 2010). In the early 2010s, complaints about rats increased sharply in Cape Town, resulting in a significant increase in funding for rodenticide-based eradication strategies (Stofile 2016). Further increases in funding were allocated in 2013, perhaps coincidentally, after the Premier of the Western Cape Province reported that she had been bitten on her toe by a rat when she went out to fetch her newspaper. Her official spokesman said, 'I know the City Bowl rats are mutant freaks of nature, but if they're starting to take nibbles out of people, we're in trouble' (Mercury correspondent 2013). Media reports described lower-income areas including Khayelitsha as being 'under siege' by 'huge' and 'human-like' 'marauding rats' (Lwandle 2013).

Low-income urban areas are particularly vulnerable to rodent infestation because of their typically dilapidated structures (providing harborage for rats), high housing densities (facilitating easy colonization of adjacent buildings) and inadequate waste management (providing food and shelter) (Himsworth et al. 2013b, 2014; Jassat et al. 2013). City spokesmen blamed residents for littering but acknowledged that the rat problem in places like Khayelitsha was fueled primarily by poor public waste management and sanitation services (Petersen 2015). Sanitation services were reportedly improved, and the City launched various public education campaigns—yet the mainstay of its approach was to target problem areas with anticoagulant rodenticides (Stone 2014). The use of 'block baiting', (placing rodenticide bait, mainly Brodifacoum, in 'hotspots' such as refuse collection points in shack settlements)

tripled in Khayelitsha from 12 600 units in 2011/12 to 37 000 in 2012/13, and 43 300 by 2013/14 (Stofile 2016).

Rodenticide use has been growing in Africa but has proved costly and ineffective at helping farmers protect their crops against rodents, prompting ecologically-based rodent management programs to seek locally acceptable alternatives (Belmain et al. 2008; Makundi and Massawe 2011). In Cape Town, rodenticides have been implicated in the accidental poisoning of children (Balme et al. 2010; Rother 2010) and in the accidental and secondary poisoning of pets (Smallhorne 2017), caracals (*Caracal caracal*) and other wildlife (Serieys et al. 2019). Bird rehabilitation facilities in Cape Town report that rodenticide poisoning is a major cause of death of owls, buzzards and other raptors and ecologists complained directly to EH officials about the poisoning of birds from rodenticide-soaked wheat grains aimed at controlling rodents. Thus, when the City of Cape Town sought to address the rodent problem in the mid-2010s, EH officials were also under pressure to reduce the use of rodenticides and promote poison-free strategies. Their innovative public works program to trap and drown rats needs to be understood in this context.

The Khayelitsha rat trapping and drowning project was conceived also as part of a broader effort to provide employment opportunities for the unemployed. South Africa has one of the highest unemployment rates in the world (Natrass and Seekings 2018). Unemployment is especially high amongst black/African people and is a major determinant of poverty (Seekings and Natrass 2015). As of 2016, almost a third (31%) of

the labor force in Khayelitsha was unemployed, whereas for the City of Cape Town as a whole, it was just over a fifth (21%) (City of Cape Town 2017: 28). National government funding is available to municipalities for short-term job opportunities through the 'Extended Public Works Program' (EPWP) (see <http://www.epwp.gov.za/>, accessed 3 Jul 2019) and local government in Khayelitsha tapped into this funding for the cage-trapping and drowning program. The pilot phase of the program ran in October 2014, employing 22 EPWP workers who caught and disposed of 4500 rats (Petersen 2015). Funding was subsequently secured for several more programs in 2015 and the program was rolled out to more parts of Khayelitsha (Stofile 2016).

The EPWP proved popular and its services were in great demand. Between 2014 and 2015 about 700 cages were issued to participating households and 119 temporary jobs were created (Stofile 2016). According to EH officials, people liked the fact that the rats were caught in the cage (because poisoned rats often died in inconvenient places such as under the floor). They also liked being able to dispose of the rat without having to touch it (as the entire cage was immersed in a bucket of water and then the drowned rat was tipped out into a bag and the cage trap reset). EH officials kept records of households visited and rats caught. This was partly an exercise in monitoring and evaluation (Lasswell's 'appraisal' function) but was also understood by local officials as necessary to promote the project ('invocation' function).

Data collected by EH officials showed substantial trapping success, though this varied across households and area. In the month of September 2015, for example, EPWP teams worked in five areas of Khayelitsha, with trapping success ranging from an average of 4 rats per household per night, to 12. EPWP workers typically trapped in successive nights until trapping success fell to zero. One household recorded 18 rats in a single night (and 4 more were caught a week later when the EPWP team was called back to that household). In such cases of multiple trapings, householders took matters into their own hands: when they heard the cage trap clicking shut, they immersed the cage in a bucket of water, tipped the dead rat in a bag to be collected by the EPWP worker in the morning, and then reset the trap themselves. Multiple killings thus reflect a serious rat problem in the house and the willingness of the householder to kill the rats and reset the trap.

Local officials in Khayelitsha—and in the City of Cape Town—were pleased with the results. The Mayoral Committee member for Public Health described the previous strategy poison baiting as 'risky' and praised the cage trap program for being 'poison free' and effective (Petersen 2015). When journalists probed officials about the method to dispose of the rats, City officials justified drowning as 'the most humane and practical way of exterminating the rats' (Bamford 2015a). City officials were interviewed on the radio about the program where they promoted it as pro-poor because it was in the interests of, and created jobs for, poor people. They also argued that it was in the interests of the environment and conservation because it avoided the secondary poisoning of predators and raptors.

This promotional strategy seemed to be doing well until one such radio broadcast was heard by NSPCA Senior Inspector Alwyn Marais. Marais took exception to the program being described as 'humane' simply because it was poison free (discussion with N.N., 21 February 2017). He contacted the City of Cape Town to inform officials that drowning was not 'humane' and was, in the opinion of the NSPCA, illegal (Bamford 2015b). This brought the cage trapping to an abrupt halt once an official prohibition notice was issued by the NSPCA.

According to the South African Animals Protection Act (no 71 of 1962), an 'animal' means 'any equine, bovine, sheep, goat, pig, fowl, ostrich, dog, cat or other domestic animal or bird, or any wild animal, wild bird or reptile which is in captivity or under the control of any person' [Section 1 (1)]. The Act then goes on to specify a range of animal treatment deemed to be cruel, including terrifying or torturing an animal. Drowning is not specifically mentioned, although it is obvious that an animal immersed in water would be stressed and terrified, and thus cruelly treated. Given that a caged rat is under the control of a person, immersing the cage in water to drown the rat could thus reasonably be seen to be illegal under the Animal Protection Act.

The NSPCA emphasizes on its website (<https://nspca.co.za>, accessed 3 Jul 2019) and in its promotional materials that it protects 'all' animals, including those defined as 'problem animals' such as jackals and rats and that these animals require the same level of consideration as animals in other contexts. However, South Africa's Animals Protection Act does not go this far, but rather explicitly allows for some forms of cruelty against so-called 'vermin'. Notably, it is illegal to use poison 'except for the destruction of vermin or marauding domestic animals or without taking reasonable precautions to prevent injury or disease being caused to animals' [Section 2(1)(d)]. It is also illegal to expose animals to immediate attack by other animals—but an exception is again made in the case of vermin if the action is conducted by vermin clubs to train hunting dogs [Section 2(1)(g)]. Trapping and killing animals is also prohibited under the Act—unless necessary to prevent the destruction of property and the spread of disease [Section 2(1)(j)]. Unlike the sale of traps to catch wild animals, no restrictions are placed on the sale of traps for rodents [Section 2(1)(l)]. In other words, many of the protections generally afforded to wild animals are explicitly disregarded with regard to pest animals, especially rodents. As far as EH officials were concerned, this implied that disposing of rats by drowning was within the spirit of the law, even if not mentioned specifically as an exception allowable for dealing with vermin. For the NSPCA, however, because the Act did not specifically provide an exemption regarding the drowning of rodents, it was illegal.

Other relevant South African legislation is unclear as to whether any of the protections contained in the Animals Protection Act apply to animals considered to be vermin/pests. The National Norms and Standards Relating to EH in Terms of the National Health Act (no 61 of 2003) fails to make any determination about how vermin (a loose term including various birds, bats, insects and rodents viewed as pests) are to be treated: it simply requires public facilities, restaurants etc. to control and eliminate vermin where necessary to protect human health. The word 'animal' does not appear in the Act which instead mentions 'pests', 'vermin' and 'disease vectors'. The only restrictions on the use of poison imposed by the Act are to protect pest control workers and to ensure that poison does not pose dangers for human health (Section 23, subsection 3: Pest and Vector Control).

The NSPCA regards the use of poison as inhumane—and this is consistent with evidence indicating that anticoagulant rodenticides cause prolonged and painful deaths from internal hemorrhaging over 5–15 days, with the animals suffering from swelling in their joints and abdomens (Mason and Littin 2003; Littin et al. 2004; Meerburg, Brom, and Kijlstra 2008; Yeates 2010; Littin et al. 2014). Death by poison is obviously a cruel death, yet the NSPCA has never challenged the legislation that allows for the poisoning of animals deemed to be pests or vermin. Rather

it takes the law as given. According to a statement by the NSPCA:

The NSPCA and SPCA movement is aware of the inconsistencies within the APA [Animals Protection Act] with regards to the control of vermin via poison, but we still strive to prevent animal cruelty in sections of the APA that legally prohibits certain acts such as drowning. (N.N., pers. comm., 15 February 2018)

Drowning has been a traditional wildlife management technique in North America and in Canada, if it takes a trapped animal <5 min to drown, it is considered sufficiently humane (Gilbert and Gofton 1982). However, drowning clearly causes stress and suffering to animals and cannot be considered to be a form of euthanasia because it causes death in minutes rather than seconds (Ludders et al. 1999; Ludders et al. 2001; AVMA 2013; Beausoleil and Mellor 2015). In this regard, the NSPCA's position on the matter is consistent with growing international concerns about the ethics of managing pests and other wildlife (Ohl and Van der Staay 2012; Littin et al 2014; Hawkins et al. 2016). Yet drowning is also argued in other contexts to be the only practical means of controlling certain 'nuisance' wildlife like beavers and muskrats—and better for the target animal than the available alternatives, notably leg-hold or body-gripping devises (Bluett 2001). Death by drowning may even be preferable to poisoning given that death from poisoning can also be painful and can occur over a much longer period. [An assessment of studies of the relative humaneness of methods to kill problem animals concluded that anticoagulant poisoning was persistently found to be the least humane of the pesticides (Littin et al. 2014). The overview did not report on any assessments of the relative humaneness of drowning. We are unaware of any evidence to ascertain whether death by drowning is more or less inhumane than death from household rodenticides or from other (illegal) poisons used in the study site. Such evidence is unlikely ever to materialize because any such study seeking to ascertain which death is the least inhumane is likely to be deemed unethical by animal ethics committees in South African universities.]

The relationship between people and rats is a situated practice (Beumer 2014). When a rat is a pet or a laboratory animal it is managed humanely (euthanized under as stress-free circumstances as possible), yet when it is seen as a 'pest', the global practice is to allow pest controllers to poison them, that is treat them cruelly. This double-standard is partly because of the complicated history of the relationship between humans and rodents (as feared pests, loved pets and neutral laboratory animals) (Edelman 2002; Beumer 2014) and partly because it is difficult to replicate the conditions (or have the proper permitted tools and drugs) for humane clinical euthanasia for free-ranging 'wild' animals. Debates about how to kill animals deemed to be pests in the wild thus quickly become mired in considerations about the 'least-worst' practical alternative—such as whether it is better for a beaver to be drowned or captured in a gin trap where it could die of shock and injuries over an extended period of time. The NSPCA's actions to halt the Khayelitsha project because drowning rats is inhumane are ethically complicated by the fact that no consideration was given to available alternatives. Stopping the drowning of rats did not stop rats from extended suffering (being treated cruelly) as cage trapping was simply replaced by predominantly by poisoning—and in addition, the resumption of poison posed dangers to non-target wildlife and even children.

Senior Inspector Marais acknowledged in an interview that if he was a rat, faced with the choice of being drowned or

poisoned to death, he would choose to be drowned because it would probably be faster and entail less suffering. He justified the NSPCA's actions on the grounds that drowning and poisoning are both inhumane but that the organization worked within a legal framework that allowed for poisoning of rats. He objected to calling one cruel procedure (drowning) 'humane' simply because it was better than the alternative and/or because it was better for other animals (pets, wildlife). The NSPCA reiterated this position, arguing that poisoning rodents:

cannot be replaced by yet another cruel and inhumane method of control, i.e. drowning. While the NSPCA acknowledges that under certain circumstances, pest and/or problem animal control and/or extermination may be required, the NSPCA only supports the use of humane methods. The NSPCA does not support methods of pest/problem animal management that cause suffering, pain, or distress to any animal. (N.N., pers. comm., 9 February 2018)

Marais was also concerned that tolerating the drowning of rats, and especially describing this as 'humane' would send out the wrong signals to the public, thereby undermining the NSPCA's mandate to promote kind and empathetic treatment of all animals. He worried that people might think that drowning is a good death—and an acceptable way of killing animals—and that they might then go on to use it on other animals (unwanted kittens, for example) and even their own children. His fear was that any sort of nuanced position, where a cruel death is weighed up against an even worse death, would weaken the NSPCA's strategic objective: to promote the social value that animals never deserve a cruel death. Such reasoning raises the possibility that if City officials had not used the word 'humane' to describe the cage-trapping and drowning project (but had instead simply described it as poison free, efficient and popular), the NSPCA might never have taken action against them. However, as the NSPCA also argued that drowning was cruel and illegal, and that it was their role to enforce the Animals Protection Act, they may well have taken action against the project however it had been described.

Khayelitsha EH officials were unimpressed with the NSPCA's position, seeing it as a cop out and a refusal to deal with the realities of resource-constrained real life. Although not under any obligation to euthanize rodents, EH officials told us that they had offered to transport the captured rats to local SPCA facilities where they could be euthanized humanely but that their offer had been declined because the SPCA lacked the capacity to manage such large numbers of rats. The NSPCA was, in the view of EH officials, thus acting unfairly and unreasonably (if not hypocritically) and was complicit in what they saw as a worse outcome for wildlife. EH officials were also convinced that their cage-trapping and drowning program enjoyed widespread support in Khayelitsha, noting that many participating households flatly refused to hand back the cage traps when the program was halted. In their view, the NSPCA was imposing (white) bourgeois values on a poor (black) community with a serious rodent problem. Our representative survey of 222 households in Site C, Khayelitsha found evidence to support this position although the issue was more nuanced than a simple racialized reading of the situation might suggest.

The view from Khayelitsha, Site C

Rodent infestation was clearly a problem in the area: 84% of households reported seeing evidence of rodent damage in the past year, 77% reported seeing rodents (rats or mice) in their house in the past week and 57% said rodents were a 'big

problem' for the household. Although the majority (80%) agreed that they were worried about rat poison posing dangers to other animals, well over a third of the sample (40%) reported having purchased rodenticides in the past year.

There was a large majority in support of the EPWP project in that over four-fifths (83%) answered 'yes' to the question 'Do you think that council workers should be allowed to set cage traps and drown the rats?'. Most of these people did not think it was cruel to drown rats. As can be seen in Table 1, almost two-thirds of respondents thought that drowning was not painful for the rat and almost all of them supported the cage-trapping and drowning project. Of those who did not support the project, most (79%) thought that drowning was painful for the rat. These 30 people, that is 14% of respondents, can be regarded as supporting an NSPCA-type position (that drowning is cruel and that the project should be halted). Most (62%) of those who believed that drowning was painful for the rat nevertheless indicated support for the cage-trapping and drowning project.

Most people (80%) recorded that they were concerned about rat poison posing dangers to non-target animals like owls and cats. As can be seen in Table 2, a higher percentage of them supported the cage-trapping and drowning project than was the case for the minority who said they did not care about secondary poisoning. The 156 people (70% of respondents) who said they worried about secondary poisoning and supported the

cage-trapping and drowning project can be seen as supporting the ecological argument adopted by EH officials.

The regression models reported in Table 3 explore how concern about the drowning of rats and poisoning of non-target animals affected the probability of supporting the cage-trapping and drowning project. The survey adjusted Wald test is used to test for each of the regressions the joint simultaneous null hypothesis that all the coefficients are equal to zero. The low *P*-values for all the regressions mean we can comfortably reject this null hypothesis.

Model 1 shows that believing that drowning was 'painful for the rat' reduced the average marginal probability of supporting the cage-trapping and drowning project by 37 percentage points. Model 2 shows that being concerned about the poisoning of non-target animals increased the average marginal probability of supporting the project by 29 percentage points. Model 3 includes both variables in the regression to tease out the conditional impact of each variable because 27% of respondents believed that drowning was painful for the rat and were concerned about the poisoning of non-target animals. It shows that controlling for believing that drowning was painful for the rat, being concerned about poisoning non-target animals increased the average marginal probability of supporting the cage-trapping and drowning project by 18 percentage points. Conversely, controlling for being concerned about poisoning non-target animals, believing that drowning was painful for the rat decreased the average marginal probability of supporting the cage-trapping and drowning project by 34 percentage points.

Regressions 3 and 4 test whether these findings remain robust to the inclusion of household and personal characteristics pertaining to socio-economic status and exposure to rodent damage. Regression 3 shows that including an indicator of exposure to rodent damage and controlling also for the household asset index improved the model (it had the lowest crossfold root mean squared error and hence the best out-of-sample generalizability) but neither of these additional control variables was statistically significant. Regression 4 includes years of education, and this too was statistically insignificant and including it weakened the model. In short, the key drivers of support for the cage-trapping and drowning project were attitudinal.

Conclusion

The animal rights agenda is perceived by many African Americans as a 'white thing' (Harris 2009: 31) and in South

Table 1: Support for the cage-trapping and drowning project by attitudes as to whether drowning is considered cruel or not^a

Should council workers be allowed to catch and drown rats?	Do you think that drowning is painful for the rat?		
	No	Yes	Total
No	8	30	38
	21.0%	79%	100%
	5.6%	38%	17.2%
Yes	134	49	183
	73.2%	26.8%	100%
	94.4%	62%	82.8%
Total	142	79	221
	64.3%	35.7%	100%
	100%	100%	100%

^aPearson $\chi^2(1) = 37.2887$ Pr = 0.000.

Table 2: Support for the cage-trapping and drowning project by concern about the secondary poisoning of non-target animals^a

Should council workers be allowed to catch and drown rats?	Does it concern you that if people use poison to kill rats and mice that other animals like cats and owls will be killed?		
	No	Yes	Total
No	17	22	39
	43.6%	56.4%	100%
	38.6%	12.4%	17.6%
Yes	27	156	183
	14.8%	85.3%	100%
	61.4%	87.6%	82.4%
Total	44	178	222
	19.8%	80.2%	100%
	100%	100%	100%

^aPearson $\chi^2(1) = 16.8211$ Pr = 0.00017

Table 3: Average marginal effects (AME) predicting the probability of answering 'yes' to the question 'Do you think council workers should be allowed to set cage traps and drown the rats?'^a

Regressors	dF/dx				
	Model 1	Model 2	Model 3	Model 4	Model 5
1 = Yes, drowning is painful for the rat	-0.372*** (0.093) P = 0.003		-0.339*** (0.088) P = 0.004	-0.351*** (0.087) P = 0.003	-0.355*** (0.085) P = 0.002
1 = Worries about rat poison killing other animals like owls and cats		0.292** (0.107) P = 0.024	0.179** (0.075) P = 0.041	0.187** (0.076) P = 0.037	0.187** (0.079) P = 0.043
1 = Experienced rodent damage in the past year				0.109 (0.081) P = 0.211	0.102 (0.083) P = 0.251
Household asset index (weighted by average price and scaled from 0 to 100)				-0.001 (0.001) P = 0.3773	-0.001 (0.001) P = 0.463
Years of education					-0.012 (0.012) P = 0.339
Observations (n)	221	222	221	221	218
Wald Test for probit model Prob > F	F(1,9) = 59.4 0.000	F(1,9) = 13.6 0.005	F(2,8) = 15.6 0.002	F(4,6) = 12.1 0.005	F(5,5) = 7.6 0.022
Average of 5-Crossfold root mean squared error estimates	0.345	0.367	0.335	0.327	0.340

^aStandard errors in parentheses.

***P < 0.005.

**P < 0.05.

Africa's highly racialized context, the actions of the NSPCA could be read (as they were by EH officials) as an act of cultural imperialism by an apartheid-era institution that prioritizes a particular reading of animal welfare over the preferences and lived reality of poor black/African South Africans. Steyn and Foster (2008) argue that white South Africans can display a form of racial blindness when pursuing their own concerns, and this perspective similarly suggests that a racialized reading of the contestation might be appropriate. The data from Khayelitsha, however, reveals a more nuanced situation in that the contestation was not over whether animals should be treated well, but over what constitutes humane treatment and for which animals—and that even within the relatively poor African suburb of Site C, Khayelitsha, different viewpoints were evident.

The data from Khayelitsha show that there was some support amongst African people living there for the NSPCA's position, although this was a minority position. It also shows a strong association between support for the cage-trapping and drowning project and concern about the poisoning of non-target animals. This, in turn, suggests that people in Site C were not unconcerned about animal welfare, but rather had a different, and more ecological, understanding of protecting animals. Whilst showing limited concern about the welfare of rats themselves, people in Khayelitsha were more in tune with concerns about the ecological impact of poison use than was the NSPCA which saw its mandate purely in terms of the Animals Protection Act of 1962—an Act that was promulgated at a time that considered neither the welfare of pest animals nor the adverse consequences of poison use for other animals.

Although tempted to challenge the NSPCA in court, EH officials reverted to using rodenticides whilst continuing to seek more humane, poison free, methods of killing rats. One of the strategies they considered was to collaborate with a local raptor rehabilitation center ('Eagle Encounters') located ~20 km from Khayelitsha. 'Eagle Encounters' typically relies on donated defective chicks from the poultry industry which they euthanize using carbon dioxide in pressurized steel containers. The idea was to deliver the captured rats to the raptor rehabilitation centre where they could be euthanized in a similar manner rather than drowned. Senior EH officials were particularly taken by this proposal, seeing it as a means of maintaining the poison-free approach, satisfying concerns about the humane treatment of rats, and as achieving additional conservation objectives (helping to rehabilitate raptors).

Unfortunately, this plan, while attractive at first blush, proved impractical and with animal welfare concerns of its own. Notably, rats would spend much longer in the cage traps, would have to endure the stress of being loaded onto a vehicle and transported to the raptor rehabilitation centre where they would be unloaded into metal containers for observation (to attempt to weed out any rats that appeared ill or poisoned) and then euthanized. There were concerns that some poisoned rats would be missed (as they were not displaying symptoms), thereby potentially endangering the raptors. Regarding the rats, aside from worries that rats could get injured (or attack each other) when transferred to the larger container, were concerns about whether death by carbon dioxide poisoning was humane or not. Studies showing that rats are averse to this gas, and that it causes pain, resulted in North American protocols recommending that it be accompanied by other inert gasses and delivered only in rising concentrations (Littin et al. 2014). There was thus a real possibility that if this program were to be implemented, the NSPCA would object to it as well. Uncertainty over how to manage caged rats within Khayelitsha, who would be responsible for

transporting the rats and whether a permit was required for this, acted as further nails in the coffin. The episode is interesting, however, because it highlights how committed EH officials were in their pursuit of poison-free and humane approaches to rodent control—and how difficult and complicated this can be. It also shows that the contestation was not simply between a supposedly African way of dealing with rodents and a ‘white’/humane way—but rather that EH officials were seeking new, innovative solutions that could satisfy a diverse public and which was both pro-poor and as humane as possible.

Ultimately EH officials continued the EPWP rodent control service but instead of using cage traps, workers presented households with a choice between poison and snap traps. Snap traps vary in size. Small snap traps (aimed at mice) are often not strong enough to kill rats but can injure or maim them. The rodent control EPWP offered households the use of larger, more powerful plastic snap traps which kill rats instantly (and thus can be regarded as humane). The downside of this method for householders was that these traps could potentially injure children and household pets and that they would have to deal with the violent, bloody aftermath (headless rats, rats cut in half, blood splatter etc.). According to EPWP managers, workers and householders preferred dealing with drowned rats than with rats mutilated by traps because they did not want to touch their broken and bloodied bodies. This aversion to touching rodents killed in traps could partly account for the fact that even when provided with snap traps (as part of a study of the acceptability of snap traps), a third of households continued to use poison (Roomaney, Ehrlich, and Rother 2012).

The story of policy contestation over the Khayelitsha cage-trapping and drowning program is one of conflicting values about how to treat rats and protect wildlife. Yet, crucially, it took place against a back-drop of wider poverty and inequality in Cape Town. Poor sanitation and inadequate housing are well understood drivers of rodent infestation and ‘integrated pest management’ approaches accordingly target rodent access, harborage and food sources (Witmer 2007; Hadidian 2010). Sanitation services are inadequate and erratic in low-income areas like Khayelitsha, especially within densely crowded shack settlements (Green 2018). Improving waste disposal is outside of the institutional control of EH officials, and short of a broader solution to a much more intractable political-economic problem, namely addressing poverty and inequality in housing and service provision, EH officials faced limited options in controlling rats. EH officials remained open to new, more humane, rodent control technologies [some of which, such as fertility control, are on the market in the USA (see ContraPest made by Senestech, <https://senestech.com>) but not yet in South Africa], although their choice of strategy will remain constricted by budgetary constraints.

The story of the contestation in Cape Town also raises questions about the role of the NSPCA as the legislative authority responsible for enforcing the Animals Protection Act. We have shown that it imposed a particular reading of animal welfare that contrasted with local, more ecological, understandings. In Ontario, Canada, the SPCA was recently stripped of its policing powers on the grounds that they were inappropriate for an organization that was ‘shielded from public view’ and insufficiently accountable and potentially subject to external influence (Casey 2019). Our case study suggests that there may also be grounds for reconsidering both the Animals Protection Act in South Africa (for its failure to address the welfare and ecological issues concerning the poisoning of pest animals) and the NSPCA’s actions in terms of this Act, especially where these undermine local, pro-poor initiatives that seek to reduce the use of ecologically harmful poison.

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