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Does the End Justify the Means? A Media Analysis of Invasive Pig and Fox Management

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Abstract

Growing numbers of researchers and animal rights advocates are concerned about the welfare of invasive nonhuman animals, and new government policies echo these concerns. Past survey research, however, shows that the general public defines invasive animal welfare differently than scientists and animal rights advocates. There is little social research that investigates how differing views on the acceptability of invasive animal controls are reconciled in public fora. This article examines how invasive animal control is represented in two newspapers—*The Sydney Morning Herald* and *The Land*—in New South Wales, Australia, focusing on the management of invasive foxes and pigs. The findings revealed that efficacy is emphasized more than humane-ness, especially among farmers and peri-urban residents, suggesting a disjuncture between new policies and landholders' values. Views of indigenous land managers and amenity migrants are rarely represented yet they need to be actively engaged to ensure effective policy change.

Keywords

human-animal interactions – animal cruelty – introduced species – attitudes – public views

Introduction

Concerns about the welfare of invasive nonhuman animals¹ are now prominent in natural and social science research, animal welfare advocacy, and policy-making. In scientific endeavors, interest in animal sentience has spread from research on livestock, companion animals and animals used in scientific experiments (Meerburg, Kijlstra, & Brom, 2008) to the humaneness of invasive animal control techniques (Choquenot, McIlroy, & Korn, 1996; Littin, 2010). Social research has followed this trend with a growing number of studies, most involving surveys, examining how diverse stakeholders view the humaneness of invasive animal controls (Fitzgerald, 2009; Fitzgerald, Fitzgerald, & Davidson, 2007). Concurrently, animal welfare advocates have raised the profile of inhumane invasive animal control methods in the media, in Australia (Chapple, 2005; Munro, 1997) and internationally (Bayvel, Diesch, & Cross, 2012).

These trends in science and advocacy are reflected in policy (Cowan & Warburton, 2011). In Australia, the Australian Animal Welfare Strategy was endorsed in 2004 to promote and protect the welfare of all animals (Mazur, Maller, Aslin, & Kancans, 2006). In 2012, Model Codes of Practice and Standard Operating Procedures for controlling some invasive animal species were published (Department of Environment and Energy, 2016). There are also proposals for a Universal Declaration on Animal Welfare (Bayvel et al., 2012) and an International Convention for the Protection of Animals (Favre, 2012), which would cover all animals.

It is frequently argued that increasing scientific and policy concerns about the humaneness of invasive animal controls have arisen in response to public attitudes (e.g., Cowan & Warburton, 2011; Fitzgerald, 2009). However, there are few, if any, longitudinal social science studies that document the public's views

1 Many terms are used to describe “invasive” nonhuman animals in public and scientific discourses. Some adjectives used to describe these animals include “pest,” “feral,” “alien,” “exotic,” and “introduced.” Dutkiewicz (2015) provides a comprehensive explanation of the connotations associated with such terms in the context of New Zealand, which equally apply in Australia. Here we use the term “invasive” to indicate that the animals are “introduced” but not kept in captivity for companionship or economic gain (O’Sullivan, 2011). The term “invasive” can also be applied to humans (Goldberg et al., 2016).

on what animals are considered “pests” and the humaneness of invasive animal controls (Seymour, 2013). Furthermore, public perceptions of humaneness are often inconsistent with scientific evaluations (Littin, Mellor, Warburton, & Eason, 2004). Surveys reveal that the public prefers non-lethal methods, such as fertility control and live hold traps (Fitzgerald, 2009), while many scientists “seek to cause disruption or death during pest control operations” (Littin et al., 2004, p. 5). The mainstream scientific perspective preferences lethal methods, such as ground shooting, because they minimize anxiety, fear, pain, and distress (Littin et al., 2004; Sharp & Saunders, 2011).

Different views on what constitutes humaneness among scientists, policymakers, animal welfare advocates, and the public have resulted in conflict. In Australia, there has been conflict about the management of feral horses in New South Wales (NSW) and the Northern Territory (Nimmo & Miller, 2007), ducks in Victoria (Munro, 1997), deer in Tasmania (Potts et al., 2015), and camels in the Northern Territory (Gibbs, Atchison, & Macfarlane, 2015). Such conflict results from different understandings of whether specific animals are problematic and accordingly, the most acceptable ways of controlling them. These understandings and attitudes vary between rural and urban populations (Fitzgerald, 2009; Fitzgerald et al., 2007), with rural populations more likely to support lethal control methods, such as aerial shooting.

In each example of conflict above, animal welfare concerns of various stakeholders were published in news media. In some cases, news media advocated for policy changes, while in other cases, they supported existing government policies. For example, Chapple (2005) argued that media bias was pivotal to the introduction of a ban on aerial culling of feral horses in NSW. Moreover, the *Canberra Times* explicitly advocated for the federal government’s policy of culling feral animals in the Northern Territory (Iffland, 1993). Beyond such high profile cases, the media has shaped public attitudes to invasive animal welfare over time (Bayvel et al., 2012); many Australian governmental and non-governmental organizations use the media to obtain and distribute information about animal welfare (Mazur et al., 2006).

The aim of this study is to explore the public discourse on humaneness of invasive animal management in the media. This study examines why animals are viewed as pests and why specific control methods are deemed acceptable. Next the article explains why the study focuses on pig and fox control in NSW and how the research was undertaken. It then provides quantitative data on the frequency with which humaneness concerns about invasive animal control were raised in two newspapers over time. Qualitative data is presented to explore the justifications for controlling invasive animals and using specific control methods. Finally, this study explains how the public discourse aligns

with scientific and animal welfare advocacy discourses, and the associated implications this has for new legislation.

Invasive Animal Management in New South Wales

In Australia, the Commonwealth, NSW, Queensland, Victorian and Western Australian governments have introduced new biosecurity legislation in the last decade. In NSW, the Natural Resources Commission (NRC) has recently reviewed invasive animal management in line with the *Biosecurity Act 2015* (NRC, 2016b; Table 1). In its final report, the NRC provides a definition of animal welfare (NRC, 2016b, p. 21) but primarily discusses welfare concerns of animal rights and hunting groups in relation to managing horses and deer. There is little consideration of the invasive animal welfare concerns of private land managers, even though they will be required to implement scientifically-determined humane control methods (NRC, 2016b). The report suggests that the government might conduct awareness campaigns to increase acceptance of invasive animal management approaches, but such campaigns have limited effectiveness in changing stakeholders' views (Riethmuller et al., 2005).

According to the NRC, invasive foxes, pigs, dogs, starlings, rabbits, goats, and carp are particularly problematic in NSW. Invasive pigs and foxes were chosen as case study species for this study because they have comparable economic costs but affect different agricultural industries and elicit diverse public responses. Invasive pigs primarily affect the grain industry, while foxes primarily affect the wool and sheep-meat industries; however, their economic impacts were estimated to be comparable at \$11.66 and \$13.46 million, respectively, in 2013-14 (eSyS Development, 2016). Past social research in Queensland indicates pigs are considered more significant problems than foxes (Finch & Baxter, 2007), and research in NSW and Victoria suggests the public is more likely to support the killing of pigs than foxes (Ballard, 2005; Johnston & Marks, 1997). We seek to understand why these animals are viewed differently despite their comparable economic impacts.

Invasive pig colonies existed in NSW prior to the 1870s because of free-roaming pig farming practices (NRC, 2016b), but invasive pigs were not declared noxious across NSW until 1955 (Choquenot et al., 1996). Invasive pigs are considered pests because they destroy crops and attack farm animals, impact native plant and animal species, and have the potential to spread diseases (NRC, 2016b). Yet invasive pigs also have value for recreational hunters and entrepreneurs who export game meat (Fitzgerald et al., 2007). According to Sharp and Saunders (2011), the most humane pig control method involves

TABLE 1 Key invasive pig and fox advocacy and policy events in NSW: 2010 to 2016

Year	Event
2010	Revised NSW Fox Threat Abatement Plan published by the Office of Environment and Heritage
2012	NSW Shooters and Fishers Party introduced the Game and Feral Animal Control Amendment Bill 2012 to allow conservation hunting in national parks The bill received royal assent
2013	Governance Review of the Game Council of NSW Game Council dissolved; services transferred to Department of Primary Industries
2014	NSW Government gazetted the Local Land Services (European Red Fox) Pest Control Order, making foxes a declared pest species in NSW
2015	Memorandum of Understanding between NSW Farmers, the NSW Liberals and Nationals that the NSW Liberals and Nationals, if re-elected, would review invasive animal management NSW Liberals and Nationals re-elected in state election NSW <i>Biosecurity Act 2015</i> was assented to, coming into effect in 2017 Premier of NSW asked the NRC to review the management of pest animals in NSW across all tenures for environmental, economic, and social benefits NRC released an issues paper on invasive animal management
2016	NRC released draft report on the invasive animal management review NRC submitted the final report <i>Shared Problem, Shared Solutions</i> to the Premier of NSW The report was approved by the NSW Government on June 1, 2017

ground shooting; the least humane methods involve the use of warfarin and sodium nitrate because of the extent and duration of suffering during death. There has been no scientific evaluation of the humaneness of the practice of pig dogging, which is commonly used by recreational hunters (Hattan, 2012) and involves the use of dogs to chase and trap pigs (Choquenot et al., 1996).

Foxes were introduced to Victoria in the 1870s and widespread in NSW by the early 1900s, yet they were only declared invasive animals in NSW in 2014. Foxes are considered pests because they kill livestock and impact threatened native species (NRC, 2016b). Foxes were initially released in Australia for recreation; however, today there are few reported benefits of invasive foxes. According to Sharp and Saunders (2011), the most humane methods for controlling foxes

involve ground shooting or the use of cyanide; the least humane methods involve leg-hold traps or sodium fluoroacetate (1080) poisoning because they cause greater suffering prior to the action causing death and during death, respectively.

Materials and Methods

One urban and one rural newspaper were selected for inclusion in the media analysis because urban and rural residents have different perceptions of invasive animals and their control (Fitzgerald, 2009; Fitzgerald et al., 2007). The *Sydney Morning Herald* (*SMH*) was chosen because it is the major daily newspaper of record published in NSW; is primarily written for a Sydney readership; and contains more detailed and less sensational articles than the *Daily Telegraph* (Lupton, 2004), the other daily Sydney-centric newspaper. The *SMH* has a print and digital circulation of approximately 400,000 (AMAA, 2016). *The Land* (*TL*) was chosen because it is a weekly rural newspaper directed at all NSW farmers (Fairfax Media, 2016); other rural newspapers in NSW are region-specific. *The Land* has a print and digital circulation of approximately 35,000 (AMAA, 2016). Both newspapers are owned by Fairfax Media.

Systematic searches of online and print articles published in the *SMH* and *The Land* were conducted using Factiva and ProQuest news databases by combining the following keywords: pig*, fox*, pig dog*, hunt*, hunting with dog*, pest, invasive, invasive animal, invasive species, feral, feral animal*, pest control, and pest management. The search was constrained to articles published between January 1, 2010, and December 31, 2015, because 2010 marked the beginning of important advocacy and policy events (Table 1) culminating in a state-wide review of invasive animal management (NRC, 2016b). Articles that did not mention invasive animal control were excluded.

Newspaper articles included in the analysis were divided into three categories: (a) foxes and their control; (b) pigs and their control; and (c) invasive animals and their control more generally (Figures 1 and 2). The latter category included 22 articles that mentioned foxes and/or pigs, but they were only included as examples of the wider theme, for example, among a list of invasive animal species.

The content of each newspaper article was analyzed to ascertain: (a) the invasive animal species mentioned and the rationales for deeming them pests; (b) the types of control methods discussed and their perceived acceptability; (c) the stakeholders identified; and (d) whether humaneness concerns were explicitly mentioned, noting whether humaneness concerns pertained to

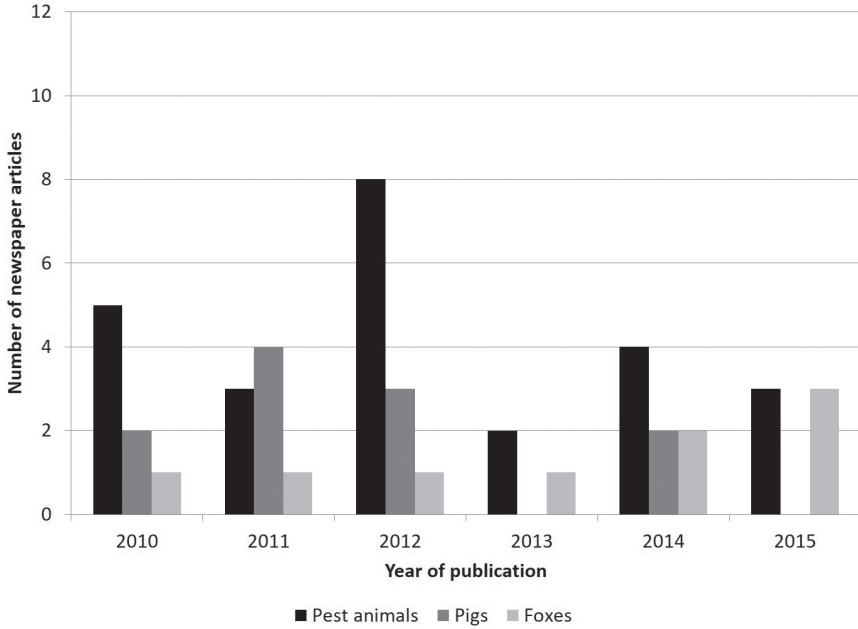


FIGURE 1 Number of articles in the *SMH* from 2010 to 2015 on invasive animals in general, foxes, and pigs.

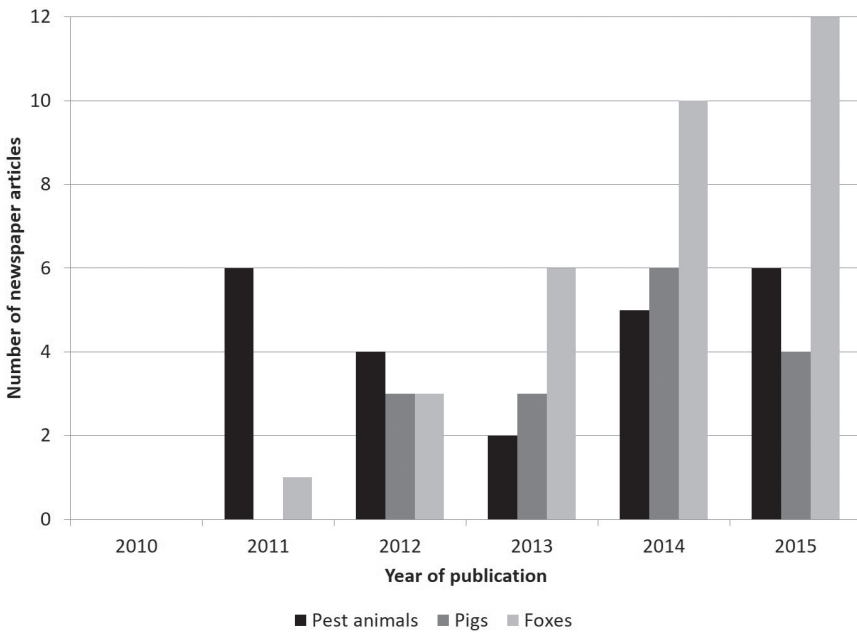


FIGURE 2 Number of articles in the *TL* from 2010 to 2015 on invasive animals in general, foxes and pigs.

invasive or non-invasive animals, such as farm animals. Next, thematic analysis was undertaken to identify patterns across all the newspaper articles regarding how invasive animals were described and their control was explained and justified.

Results

Overall, 116 newspaper articles were included in the analysis, 44 from the *SMH* and 72 from *TL* (Figures 1 and 2). Both newspapers published an approximately equal number of articles on invasive species management in general (*TL*: 23, *SMH*: 25). *TL* published 1.5 times as many articles on pigs (*TL*: 16, *SMH*: 11) and 3.5 times as many articles on foxes compared to the *SMH* (*TL*: 32, *SMH*: 9).

Five-sixths (97/116) of the articles did not mention humaneness concerns. Of those that did, fifteen discussed the welfare of invasive animals, two discussed the welfare of farm animals, one discussed the welfare of invasive and farm animals, and one discussed the welfare of animals generally. Overall, welfare concerns were raised in 22.7% of articles in the *SMH* and 13.9% of articles in *TL* (Figure 3). This difference in proportions is not statistically significant ($p = 0.05$).

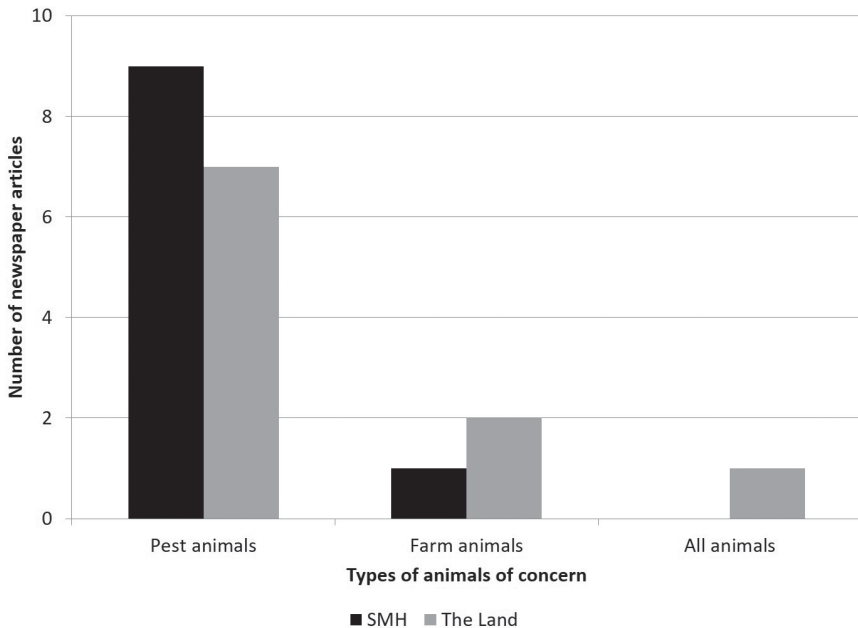


FIGURE 3 Number of newspaper articles in the *SMH* and *The Land* that mentioned in/humaneness in the context of invasive animal control and the types of animals who were the focus of such concerns.

TABLE 2 Classification of humaneness of invasive animal control methods in the newspaper articles

Animal	Humane control methods	Inhumane control methods
Foxes	Ground shooting (<i>TL</i> , 11/7/14) PAPP (<i>TL</i> , 10/5/12 and 10/7/14) Trapping (<i>TL</i> , 11/7/14)	
Pigs	Ground shooting (<i>SMH</i> , 8/9/12) Pig dogging (<i>SMH</i> , 15/4/11)	Ground shooting (<i>SMH</i> , 18/4/11) Pig dogging (<i>SMH</i> , 5/6/10 and 8/9/12)

Within the 19 articles that explicitly considered invasive animal welfare, humaneness of fox control methods was only mentioned in *TL* and the humaneness of pig control was only mentioned in the *SMH* (Table 2). No fox control methods were considered inhumane in the articles analyzed. Disagreement existed about whether ground shooting and pig dogging were humane.

When the term humane was used, there was little explanation of what it meant. For example, there was mention of “humane practices” and “humane animal treatment provisions” (*SMH*, 4/18/11). For some actors, humaneness was one of several objectives. For example, the RSPCA called for control methods that are “justified, effective and humane” (*SMH*, 4/18/11), which is consistent with the broader themes that emerged. Overall, the articles focused on: (a) justifying why particular animals are pests needing control; (b) determining the most effective control methods; and (c) meeting humaneness requirements set out in legal frameworks. While there was some consideration of humaneness in the first two themes, it was largely discussed as a legal, rather than a moral, issue.

Justifying “Pest” Status

Three arguments were used to justify deeming animals as pests. These were: the differentiation between more and less valued animals; consideration of the economic and environmental impacts of the animals; and judgment about whether the threat posed by the animals was imminent, enduring, and/or growing.

Valued Animals

There was some recognition in the articles that the definition of a pest depends on a person’s values: “Depending on your perspective, a possum may be a cute creature or annoying pest” (*SMH*, 7/12/14). This was particularly notable for

foxes, where seven articles—five in *TL* and two in the *SMH*—acknowledged that some foxes are companion animals, “Dozens of people across the state own tame foxes that are considered as much a part of the family as any cat or dog” (*SMH*, 12/7/14). Six of these articles were published in the five months prior to, and two months immediately after, the introduction of the Local Land Services (European Red Fox) Pest Control Order.

Foxes, pigs, and other animals were primarily considered pests when they killed companion animals, livestock, and native animals. Such predators were often demonized, thereby justifying their control.

[T]his [fox] is the prime suspect in the killing of “Drumstick,” a Rhode Island Red chicken owned and loved by Alexi Boyd [a peri-urban resident] and her family.... The fox is just one of a rapidly growing number who are causing devastation among wildlife and domestic animals across Sydney ... Mrs. Boyd said the council should step up baiting. “We are talking about people’s companion animals here,” she said.

SMH, 8/9/15

When invasive animals were discussed in the context of non-invasive animals, the humaneness of the control method was unimportant if the outcome improved the health and welfare of non-invasive animals. A notable exception came from one animal rights group, Fox Rescue. This group believed foxes do what is innate, and so they advocate non-lethal control methods. The article reported that Fox Rescue concedes that the killing of foxes is acceptable if done humanely, although no explanation was provided of what humane killing entails.

People view them [foxes] as pests because they kill livestock and natives, but hating something because it is trying to survive is not justifiable. If others want to shoot and trap them, fair enough so long as it is done humanely.

TL, 7/11/14

Preserving the lives of companion animals, livestock, and native fauna was of prime importance. Pest animals were those who killed such valued animals and thus were worthy of non-lethal or lethal control.

Economic and Environmental Impacts

The economic impacts of invasive animals on farmers’ incomes, the viability of the agricultural sector, and the NSW economy more broadly were used to justify deeming specific animals as pests: “[T]he Greater Sydney Local Land

Services ... considers them [feral pigs] a major biosecurity threat because they carry diseases ... destroy forests, farms and gardens ... [and can] cause \$20,000 worth of damage to a single farm crop" (*SMH*, 6/10/14).

Environmental impacts were also frequently mentioned but received less attention than economic impacts and were rarely raised in isolation of economic concerns and/or concerns for valued animals: "Mr. Heffernan [a lamb producer] said a dollar value should be put on the damage to the environment foxes caused by killing small mammals" (*SMH*, 1/2/15). The environmental impacts mentioned included biodiversity loss associated with the killing of native fauna and the destruction of habitat and other native flora. Invasive animals were not only considered problematic because they killed valued animals but also because such losses resulted in broader economic and environmental impacts. Concerns about the humaneness of control methods were not part of this discourse.

Imminent, Enduring, and Growing Threat

In some articles, the main rationale for killing invasive animals was the size of the population. For example, one article (*TL*, 8/22/13) mentioned numerical estimates of pig populations as well as "population" and "number" 17 times.

"My office has received reports from right across NSW about the scale of the feral pig problem and the situation is now becoming critical," she said. "An elevated, co-ordinated, tenure-blind and strategic response is now required." ... "As fast as we can kill the pigs they're coming from other places." ... "Pig numbers are just exploding in these parts," he said.

TL, 8/22/13

Invasive animals were also considered problematic if they had existed in an area for a long time and/or were spreading into new areas.

Mr. Wishart said the LLS [Local Land Services] had made some big achievements, but regrettably, feral pigs were "here to stay" ... "They're increasing in range and density. We're now hearing about them in the north of South Australia and in central Victoria where they weren't previously."

TL, 11/18/15

In this context, preferred control methods were those that kill a large number of invasive animals, such as shooting and baiting, with no discussion of animal welfare: "In October Mr. Mifsud worked with the Darling and Western

Livestock Health and Pest Authorities (LHPA) to lay thousands of baits on some 80 properties.... ‘It knocked the fox and dog population down considerably,’ he said” (*TL*, 5/16/13).

“Effectiveness” of Animal Control Methods

Once a case was made for why specific animals were pests in need of control, most articles discussed animal control option/s. Decisions about what method to use were often related to “effectiveness” and “efficiency.” There were three dimensions to this. The first was the effectiveness of control methods in protecting valued animals, especially minimizing livestock losses.

According to the government body [Forests NSW], there have been no stock losses on farms bordering the State forests around Tumbarumba and Batlow which Mr. Goldspink [a trapper who uses soft-jawed traps] has patrolled for the past six and-a-half years.

TL, 6/29/11

Control methods that had minimal impacts on native animals and companion animals were also preferred; “Poison baiting or trapping carries the risk of killing native animals, and ‘dogging’—hunting with pig dogs—is cruel” (*SMH*, 9/8/12). A new poison, para-amino propiophenone (PAPP), was preferred by graziers and scientists because it has an antidote for treating non-target animals; “A lot of people won’t use 1080 because they’ve had experiences with their working dogs picking up their baits and dying. PAPP can be taken up by those people because there is an antidote” (*TL*, 5/10/12).

Similarly, efforts were made to find methods of distributing baits that were unlikely to affect companion animals.

[T]he [NSW National Parks and Wildlife] Service is to begin using the M-44 ejector.... It spurts poison into the mouth of the fox or wild dog pulling on it. “The beauty with the ejector is it is target-selective,” says Rob Hunt.... It is safer than burying poison in meat, which puts domestic dogs and native species at greater risk of taking the bait.

SMH, 10/2/10

Thus, the welfare of non-invasive animals was a key consideration in evaluating effectiveness. The second dimension of the effectiveness discourse involved financial considerations; low costs outweighed welfare concerns for invasive animals. For example, PAPP is considered more humane for controlling foxes than 1080 because animals who have consumed a sufficient amount

of the toxin quickly become lethargic, unconscious, and then die; the animals show fewer signs of pain or distress (Marks, Gigliotti, Busana, Johnston, & Lindeman, 2004). However, one of the scientists who developed PAPP noted, "Because PAPP is going to be more expensive, I think 1080 will maintain its place in a rangeland pastoral context" (*TL*, 5/11/12).

The third dimension of effectiveness is related to the ability to reduce numbers of invasive animals, often in a short time-frame. Recreational and professional hunters and their associated advocacy groups were a prominent voice within this discourse.

"The Game Council's support for pig dogging as an effective means of feral animal control is based on the statistical success of it in hunting, and the lack of suitable alternatives," he said, citing the 3914 pigs killed this way in state forests since 2006.

SMH, 6/5/10

Overall, the three criteria used to determine what animals are pests in need of control were the same as those used to justify the most "effective" methods. These criteria were protecting valued animals, minimizing economic costs, and reducing the number of invasive animals. While there was some consideration of the welfare of invasive animals, such concerns were given lower priority.

Humaneness and Il/legality of Invasive Animal Control

Nine articles mentioned the legal requirements to kill invasive animals, such as those mandated in pest control orders, and needing accreditation to use poisons. Associated with these legal concerns were nonhuman animal and human welfare concerns. There were references to the legal requirement to report animal cruelty and kill invasive animals humanely. Some commented on how the legal requirement to kill invasive animals can result in the inhumane treatment of domesticated animals.

Foxes are the most recent animals to be declared a pest species in NSW (Table 1). This recent change in legislation was captured in the newspaper articles with seven articles advocating for or against it, or simply describing this new legislation. In these articles, consideration was given to the legality of keeping foxes as companion animals and the potential for foxes to suffer because guardians may not be able to get them treated by vets.

This decision poses some serious animal welfare concerns.... Without a no-kill option, you create the real risk of people keeping them illegally,

in an unregulated fashion. And when that happens, it means they can't legally seek veterinary care for them.

SMH, 12/7/14

Note here the concern is with the welfare of those considered companion animals, not invasive animals.

For foxes, concern was also expressed about being accredited in the legal requirements and safe use of baits. This concern was about public safety rather than the humane killing of foxes.

The Cumberland Livestock Health and Pest Authority (LHPA) will be holding two accreditation courses for 1080 and Pindone use.... "The course provides information on the safe use of these chemicals and legal requirements around their use, which is important for the safety of those using them and the community in general."

TL, 1/31/13

For pigs, concern was expressed about the practice of pig dogging breaking animal cruelty guidelines. The emphasis was on whether pig dogging was legal, rather than humane.

The Game Council of NSW is calling for volunteers to use dogs to hunt feral pigs in state forests, but the practice appears to break state government animal cruelty guidelines ... the legality of "pigdogging" hinges on whether packs of trained dogs simply locate pigs or whether they "hold" them in position until a hunter arrives and kills the pig with a gun or a knife.

SMH, 4/15/11

The presence of animal welfare legislation and legal requirements about the use of chemicals provided the main avenue for raising animal welfare and public safety concerns. Yet the legal definitions of animal cruelty were not debated, rather debate surrounded the justification of deeming animals to be pests in legislation and the welfare ramifications of doing so.

Discussion

Animal welfare concerns received limited attention in the newspaper articles analyzed. Instead, most articles foregrounded explanations of why particular

animals are pests in need of control. Articles focused on the goals of protecting valued animals, minimizing economic impacts, and reducing invasive animal populations (ends), rather than the ways (means) those goals are achieved. This is consistent with past research, which has found that many people are uncomfortable with the taking of animal lives and that public discourses reflect this discomfort by glossing over details about how animals are killed (Gibbs et al., 2015; Jepson, 2008). In the discussion that follows, consideration is given to the ways invasive animals were differentiated from other animals, how efficacy and welfare discourses interacted, and the voices missing from current media debates.

The results support the notion of a sociozoologic scale, whereby humans rate animals on moral and social grounds and treat animals in specific ways depending on their perceived worth (Arluke & Sanders, 1996). The newspaper analysis revealed a clear ranking of animals. Companion animals, farm animals, and native animals are highly valued animals. Other animals, such as foxes and pigs, are widely considered pests because of their impacts on valued animals. This is consistent with empirical research, which has consistently found invasive animals to be ranked unfavorably compared to native animals; native animals are ecologically valuable while invasive animals are unwanted because they are foreign and impact on native animals (Fitzgerald et al., 2007; Gibbs et al., 2015; McCrow-Young, Linné, & Potts, 2015). The newspaper analysis showed that invasive animals are also compared unfavorably to companion animals and farm animals, and that the economic and environmental impacts of invasive animals further entrench their low status and perpetuates the notion that they are inherently “bad.”

Some individual animals challenge the general categorization of whole species as pests. For example, seven newspaper articles mentioned foxes as companion animals. Past research has also found diverse views about whether foxes are pests. Johnston and Marks (1997) found that 8% of Victorians surveyed did not consider foxes to be pests and 6% were undecided. Similarly, in the media analysis conducted by Lunney and Moon (2008), the only article that mentioned foxes was a letter to the editor in defense of foxes. Government policies do not accommodate such divergent views on what constitutes an invasive animal. For example, the NRC (2016b) suggests that education campaigns are required to discourage the illegal trade of invasive animals, but it does not explicitly recognize that some invasive animals are kept as companion animals. A lack of transparent engagement with such views is likely to undermine policy success (Selge, Fischer, & van Der Wal, 2011).

Past social research has evaluated what invasive animal control methods are perceived to be the most effective (Fitzgerald, 2009). However, the definition of

“effective” is usually open to interpretation by participants. There were three dimensions to effectiveness in the newspaper articles. These were: (a) reducing impacts of control methods on non-target species; (b) minimizing control costs; and (c) reducing invasive animal numbers quickly. Past international research has focused on the latter two. Selge et al. (2011) found that various stakeholders in north-east Scotland are primarily concerned about the effectiveness of invasive animal controls in reducing pest population numbers. Likewise, in their analysis on the media framing of possums as pests in New Zealand media, McCrow-Young et al. (2015) noted an emphasis on numbers and costs, which provides a sense of victory and success. Few studies in Australia have evaluated the significance of costs to evaluations of different pest control measures, and Fitzgerald (2009) concluded that “cost is generally not a key consideration for the public” (p. 40). The results of the newspaper analysis indicate that costs are used by the public to evaluate the effectiveness of pest control in Australia, alongside controlling populations and protecting valued animals.

Deliberations about the humaneness of control methods received less media attention than the effectiveness. While this contradicts past survey research, which has found that the public believes humaneness should be the first criteria used to decide between various forms of control (Fitzgerald, 2009), it is consistent with other empirical research. For example, Kellert and Westervelt (1983) found that animal welfare concerns do not receive much media attention despite moralistic concerns about animals being rated as important in surveys. Similarly, Selge et al. (2011) found that diverse stakeholders prioritized the effectiveness of control methods to reduce numbers above moral aspects of species control. Thus, if invasive animal control methods are solely justified using moral criteria, there may be public resistance if such methods are perceived to be less effective. As per Selge et al. (2011), we argue that such resistance may be addressed by inviting public debate on the harms and benefits of invasive animal species; the available control options; and the impacts of controls on a range of species, ensuring that the full spectrum of values are represented in such a debate.

Views on the humaneness of invasive animal control methods in the media are not consistent with those in scientific reports (e.g., Sharp & Saunders, 2011). In the newspaper articles, ground shooting, baiting using PAPP, and trapping were all considered humane ways to kill foxes (Table 2) and PAPP was considered more humane than 1080. According to scientific research, ground shooting causes the least suffering to foxes, with shooting of the head resulting in less suffering than shooting the chest (Sharp & Saunders, 2011). There was no differentiation between types of ground shooting in the newspaper articles.

Poisoning using 1080 as well as trapping through cages, foot-hold and leg-hold traps are considered by scientists to result in the most suffering for foxes (Sharp & Saunders, 2011). The thematic analysis indicates that these different perspectives on humaneness result from scientists focusing on the welfare of control methods for target species, while the public prioritizes the welfare of non-target animals.

The other key difference between scientific and public discourses about the humaneness of control methods involves the level of detail provided on the act of killing animals. In the articles analyzed here, as in other media analyses (e.g., Freeman, 2009; Jepson, 2008), little information was provided about the act of killing animals. The most notable exception is an article in the *SMH* (8/9/12) that provided a firsthand account of hunting and ground shooting a pig. More generally, the articles discussed animal species rather than individuals and mentioned that control methods “knock down” or “put to sleep” animals. Such linguistic techniques help humans avoid feelings of guilt (Freeman, 2009) and a sense of discomfort about killing animals (Jepson, 2008).

Evidence that the public prefers to avoid dealing with the details and reality of controlling invasive animals is important given that until now there has been limited enforcement of invasive animal control in NSW. The NSW Government has supported in principle the NRC’s recommendation of “improv[ing] enforcement and compliance through consistent and streamlined regulation” (Department of Primary Industries, 2017, p. 16), meaning that the act of killing animals will require closer examination (Gibbs et al., 2015) and careful engagement with all land managers to understand their values and beliefs.

There are many voices missing from the articles analyzed, notably, views of rural land managers who do not operate their property for primary production, such as hobby farmers or other amenity migrants. This silence was also evident in the submissions to the NRC review of invasive animal management; the land managers who made submissions managed at least 30 ha (NRC, 2016a). Indigenous perspectives were similarly sidelined; only one article mentioned indigenous perspectives on invasive animal management (*SMH*, 3/19/12). This article did not explain how species come to be defined as pests or whether humaneness concerns affected decisions about control methods. Yet past research has found significant differences in indigenous and non-indigenous Australian views of invasive animals (Aslin & Bennett, 2000). There was also just one indigenous submission to the NRC review process (NRC, 2016a). Given the increasing diversification in the types of people who own rural property in NSW and Australia more broadly (Argent, Tonts, Jones, & Holmes, 2010)—there are approximately 6,000 indigenous land holdings in NSW (Altman, 2013) and 18 native title claims registered with the National Native Title Tribunal

(www.nntt.gov.au)—it is important to understand the views of those who are not represented in the mainstream media.

Conclusion

Survey research suggests that in the last two decades, the public has become more concerned about invasive animal welfare (Fitzgerald, 2009), yet the results of the newspaper analysis reveal that the public continues to prioritize the welfare of companion, farm, and native animals. Indeed, the economic and environmental impacts of invasive animals, associated with their behaviors, numbers, and spread, receive much greater attention than concerns about their welfare. Thus, there is little evidence in the media that increasing scientific and policy concerns about the humaneness of invasive animal controls have arisen in response to public attitudes. Instead, scientists and animal rights groups are the main actors raising invasive animal welfare concerns in public fora.

The disjunct between scientific, animal rights, and public concern for animal welfare is reflected in attitudes towards control options. While scientists focused on control methods that minimize the suffering of invasive animals, the public prioritized control methods that are cost-effective, rapidly reduce invasive animal numbers, and minimize the impacts to valued animals. Thus, when governments evaluate and recommend best practice control methods, they need to consider: (a) the diverse—scientific and non-scientific—interpretations of humaneness; (b) effectiveness considerations; and (c) social norms that involve avoiding directly talking about the taking of animal lives. One way to achieve this is to initiate wide-ranging public debate about the harms and benefits of invasive animals, the impacts of control methods on invasive and non-invasive animals, as well as their economic and environmental costs.

References

- Altman, J. C. (2013). Land rights and development in Australia: caring for, benefiting from and governing the indigenous estate. In L. Ford & T. Rowse (Eds.), *Between indigenous and settler governance* (pp. 121-134). Oxon, United Kingdom: Routledge.
- AMAA. (2016). The land average net paid print sales. Retrieved from <http://www.auditedmedia.org.au/ed/mobile/display/publication/169>.

- Argent, N., Tonts, M., Jones, R., & Holmes, J. (2010). Amenity-led migration in rural Australia: a new driver of local demographic and environmental change? In W. G. Luck, R. Black, & D. Race (Eds.), *Demographic change in Australia's rural landscapes: implications for society and the environment* (pp. 23-44). Dordrecht, The Netherlands: Springer.
- Arluke, A., & Sanders, C. (1996). *Regarding animals*. Philadelphia, PA: Temple University Press.
- Aslin, H., & Bennett, D. H. (2000). Wildlife and world views: Australian attitudes toward wildlife. *Human Dimensions of Wildlife*, 5(2), 15-35. DOI: 10.1080/10871200009359177.
- Ballard, G. (2005). *Understanding people to improve wildlife management: case studies in human dimensions research from New South Wales, Australia*. Unpublished doctoral dissertation. University of New England: Armidale, Australia.
- Bayvel, A. C. D., Diesch, T. J., & Cross, N. (2012). Animal welfare: a complex international public policy issue: economic, policy, societal, cultural and other drivers and constraints. A 20-year international perspective. *Animal Welfare*, 21(1), 11-18.
- Chapple, R. (2005). The politics of feral horse management in Guy Fawkes River National Park, NSW. *Australian Zoologist*, 33(2), 233-246. DOI: 10.7882/az.2005.020.
- Choquenot, D., McIlroy, J., & Korn, T. (1996). *Managing vertebrate pests: feral pigs*. Canberra, Australia: Bureau of Rural Sciences.
- Cowan, P., & Warburton, B. (2011). Animal welfare and ethical issues in island pest eradication. In C. R. Veitch, M. N. Clout, & D. R. Towns (Eds.), *Island invasives: eradication and management* (pp. 418-421). Gland, Switzerland: International Union for Conservation of Nature.
- Department of Environment and Energy. (2016). Model codes of practice and standard operating procedures for the humane capture, handling or destruction of feral animals in Australia. Retrieved from <https://www.environment.gov.au/biodiversity/invasive-species/publications/model-codes-practice-feral-animals>.
- Department of Primary Industries. (2017). NSW government responses: state-wide review of pest animal management. Sydney, Australia: New South Wales Department of Primary Industries.
- Dutkiewicz, J. (2015). Important cows and possum pests. *Society & Animals*, 23(4), 379-399. DOI: <https://doi.org/10.1163/15685306-12341371>.
- eSys Development. (2016). *Cost of pest animals in NSW and Australia, 2013-14*. Sydney, Australia: eSys Development Pty Ltd.
- Fairfax Media. (2016). The Land. Retrieved from <http://www.fairfaxagmedia.com.au/the-land-1025.html>.
- Favre, D. (2012). An international treaty for animal welfare. *Animal Law*, 18(2), 237-280.
- Finch, N. A., & Baxter, G. S. (2007). Oh deer, what can the matter be? Landholder attitudes to deer management in Queensland. *Wildlife Research*, 34(3), 211-217. DOI: <https://doi.org/10.1071/WR06002>.

- Fitzgerald, G. (2009). *Public attitudes to current and proposed forms of pest animal control. A summary and review of the Australasian and selected international research*. Canberra, Australia: Invasive Animals Cooperative Research Centre.
- Fitzgerald, G., Fitzgerald, N., & Davidson, C. (2007). *Public attitudes towards invasive animals and their impacts*. Canberra, Australia: Invasive Animals Co-operative Research Centre.
- Freeman, C. P. (2009). This little piggy went to press: the American news media's construction of animals in agriculture. *The Communication Review*, 12(1), 78-103. DOI: 10.1080/10714420902717764.
- Gibbs, L., Atchison, J., & Macfarlane, I. (2015). Camel country: assemblage, belonging and scale in invasive species geographies. *Geoforum*, 58, 56-67. DOI: 10.1016/j.geoforum.2014.10.013.
- Goldberg, A., Mychajiliw, A., & Hadly, E. (2016). Post-invasion demography of prehistoric humans in South America. *Nature*, 532, 232-235.
- Hattan, R. (2012). Pig dog hunting: putting a leash on feral hunters? *Australian Animal Protection Law Journal*, 8, 66-77.
- Iffland, K. (1993). Reducing the feral onslaught. *The Canberra Times*, p. 11.
- Jepson, J. (2008). A linguistic analysis of discourse on the killing of nonhuman animals. *Society & Animals*, 16(2), 127-148.
- Johnston, M. J., & Marks, C. A. (1997). *Attitudinal survey on vertebrate pest management in Victoria*. Frankston, Australia: Victorian Department of Natural Resources and Environment.
- Kellert, S. R., & Westervelt, M. O. (1983). Historical trends in American animal use and perception. *International Journal for the Study of Animal Problems*, 4(3), 133-146.
- Littin, K. E. (2010). Animal welfare and pest control: meeting both conservation and animal welfare goals. *Animal Welfare*, 19(2), 171-176.
- Littin, K. E., Mellor, D. J., Warburton, B., & Eason, C. T. (2004). Animal welfare and ethical issues relevant to the humane control of vertebrate pests. *New Zealand Veterinary Journal*, 52(1), 1-10.
- Lunney, D., & Moon, C. (2008). The portrayal of human-wildlife interactions in the print media. In D. Lunney, A. Munn, & W. D. Meikle (Eds.), *Too close for comfort: contentious issues in human-wildlife encounters* (pp. 52-64). Sydney, Australia: Royal Zoological Society of New South Wales.
- Lupton, D. (2004). 'A grim health future': food risks in the Sydney press. *Health, Risk and Society*, 6(2), 187-200. DOI: 10.1080/1369857042000219751.
- Marks, C. A., Gigliotti, F., Busana, F., Johnston, M., & Lindeman, M. (2004). Fox control using a para-aminopropiophenone formulation with the M-44 ejector. *Animal Welfare*, 13, 401-407.
- Mazur, N. A., Maller, C. J., Aslin, H. J., & Kancans, R. (2006). *Australian animal welfare strategy stakeholder analysis phases 1-4*. Canberra, Australia: Bureau of Rural Sciences.

- McCrow-Young, A., Linné, T., & Potts, A. K. (2015). Framing possums: war, sport and patriotism in depictions of brushtail possums in New Zealand print media. *Animal Studies Journal*, 4(2), 29-54.
- Meerburg, B. G., Kijlstra, A., & Brom, F. W. A. (2008). Perspective: the ethics of rodent control. *Pest Management Science*, 64(12), 1205-1211. DOI: 10.1002/ps.1623.
- Munro, L. (1997). Framing cruelty: the construction of duck shooting as a social problem. *Society & Animals*, 5(2), 137-154.
- Nimmo, D. G., & Miller, K. K. (2007). Ecological and human dimensions of management of feral horses in Australia: a review. *Wildlife Research*, 34(5), 408-417. DOI: 10.1071/WR06102.
- NRC. (2016a). *Pest animal review draft report submissions 2016*. Sydney, Australia: New South Wales Natural Resources Commission.
- NRC. (2016b). *Shared problem, shared solutions: pest animal management review. Draft report March 2016*. Sydney, Australia: New South Wales Natural Resources Commission.
- O'Sullivan, S. (2011). *Animals, equality and democracy*. Houndmills, United Kingdom: Palgrave Macmillan.
- Potts, J. M., Beeton, N. J., Bowman, D. M. J. S., Williamson, G. J., Lefroy, E. C., & Johnson, C. N. (2015). Predicting the future range and abundance of fallow deer in Tasmania, Australia. *Wildlife Research*, 41(8), 633-640.
- Riethmuller, J., McPhee, S., McLean, S., Ritchie, D., Matthews, J., Blackie, D., ... Box, G. (2005). *Facilitating the management of foxes on private land: are landholders interested?* 13th Australasian Vertebrate Pest Conference, Wellington, New Zealand, May 2005.
- Selge, S., Fischer, A., & van Der Wal, R. (2011). Public and professional views on invasive non-native species—A qualitative social scientific investigation. *Biological Conservation*, 144(12), 3089-3097. DOI: 10.1016/j.biocon.2011.09.014.
- Seymour, M. (2013). "Support your local invasive species": animal protection rhetoric and nonnative species. *Society & Animals*, 21(1), 54-73. DOI: 10.1163/15685306-12341269.
- Sharp, T., & Saunders, G. (2011). *A model for assessing the relative humaneness of pest animal control methods*. Canberra, Australia: Department of Agriculture, Fisheries and Forestry.