POLICY PERSPECTIVE

Conservation or politics? Australia's target to kill 2 million cats

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Abstract
The Australian Government's 5-year Threatened Species Strategy contains four priority action areas and associated targets. Here, we argue that the well-publicized target to cull 2 million feral cats has a weak scientific basis because: (1) reliable estimates of Australia’s cat population size did not exist when the target was set; (2) it is extremely difficult to measure progress (numbers of cats killed) in an accurate, reliable way; and, most importantly, (3) the cull target is not explicitly linked to direct conservation outcomes (e.g., measured increases in threatened species populations). These limitations mean that the cull target fails to meet what would be considered best practice for pest management. The focus on killing cats runs the risk of distracting attention away from other threats to biodiversity, most prominent of which is widespread, ongoing habitat loss, which has been largely overlooked in the Threatened Species Strategy. The culling target is a highly visible symbol of a broader campaign around feral cat research and management in Australia, rather than a direct indicator of conservation action and success. We are concerned that progress toward the 2 million target could be misinterpreted as progress toward conserving threatened species, when the link between the two is not clear.

KEYWORDS
biodiversity conservation, environmental policy, evidence-based policy, extinction, feral cats, invasive species, pest management, threatened species conservation

1 | INTRODUCTION

Environmental policy often includes targets—time-bound goals for changes in biodiversity, threatening processes, and the impacts of conservation actions (Butchart, Di Marco, & Watson, 2016). Targets can aid in the communication of complex environmental issues and help to motivate and direct actions. In the midst of the sixth global mass extinction crisis, it is understandable that international organizations and governments want to be seen as proactive and supporting ambitious attempts to halt biodiversity loss and promote recovery (Campbell, Hagerman, & Gray, 2014; Doherty et al., 2018). Prominent global targets include the United Nations’ Sustainable Development Goals and the Convention on Biological Diversity’s Aichi Targets.

Despite the benefits of targets, they also have limitations. Targets have been criticized for being ambiguous, unambitious, underfunded, and difficult to measure progress toward (Butchart et al., 2016; Maxwell et al., 2015). Targets can also be politically motivated and have little or no scientific basis (Bille, Le Duc, & Mermet, 2010; Campbell et al., 2014).
Such targets are often less ambitious than evidence-based targets (Svancara, Scott, & Groves, 2005). For instance, Aichi Target 11 for protected areas was hotly debated by governments and nongovernment organizations based on scientific and political grounds before the final area-based targets of 17% of terrestrial and 10% of marine areas were agreed upon (Campbell et al., 2014). Because targets often feature in public policy and can be used in political campaigning, they are prone to misuse. Targets can imply governments are committed to conservation, despite lacking clear links to measurable, on-ground outcomes (Kearney & Farebrother, 2014; Russell-Smith et al., 2015; Sabalow, 2016). These challenges highlight the need for transparency in target setting to convey how targets are derived and measured, and what outcomes are expected.

A high-profile example that illustrates these issues is Australia's first Threatened Species Strategy, which was launched in July 2015. The 68-page document is described as an “approach of science, action and partnership [that] can be used to achieve the long-term goal of reversing species declines and supporting species recovery” (Department of the Environment, 2015). The strategy identified four priority action areas: (a) tackling feral cats, (b) safe havens for species most at risk, (c) improving habitat, and (d) emergency intervention to avert extinctions. These action areas were accompanied by a series of targets to be achieved by years 1, 3, and 5 of the strategy. The most well-publicized target has been the target to cull 2 million feral cats Felis catus by 2020. Other targets related to feral cats are eradication of feral cats from five islands, 10 feral cat-free mainland exclosures established, best practice feral cat control established across 10 million hectares of open landscapes, and best practice feral cat control implemented in 2 million hectares of Commonwealth land (Department of the Environment, 2015). The announcement and subsequent promotion of the culling target garnered considerable public interest and media attention—both in Australia and abroad—yet the scientific basis for the target and its implementation remain questionable.

We argue that the 2 million cat target has a weak scientific basis because: (1) there was no reliable estimate of the number of feral cats in Australia when the target was set; (2) it is extremely difficult to measure progress (number of cats killed) in a robust way; and (3) the culling target is not explicitly linked to direct conservation outcomes (e.g., measured increases in threatened species populations). The Australian Government's approach toward feral cat control has broader lessons and implications for conservation and pest management policy globally. Note that we use the word “cull” throughout this article, as this is the term used in the Threatened Species Strategy, although we acknowledge that the true meaning of cull relates to selective removal of individuals, rather than wholesale population reduction.

2 | HOW MANY MILLION?

When the Threatened Species Strategy targets were developed, there was no reliable estimate of the number of feral cats in Australia. Unverified continental-scale estimates reported in the literature ranged from 3.8 to 18.4 million cats (Hone & Buckmaster, 2014). Based on the land area of Australia, Hone and Buckmaster (2014) suggested that the commonly quoted estimate of ~5–18 million cats may have been extrapolated using density estimates from a single location. In 2017, empirical modeling using 91 density estimates from across the continent estimated that the true number of feral cats in Australia is likely considerably lower, ranging from ~2.1 to 6.3 million (Legge et al., 2017). In light of the revised and far more credible estimate, the proportion of Australia's cat population to be killed under the target increased more than twofold from ~11–40% (assuming a population of 5–18 million) to 32–95% (assuming a population of 2.1–6.3 million). Whether this affects the significance of the culling target is unclear because no publicly available rationale for the figure of 2 million is available. If the target was set to kill a specific proportion of the Australian cat population, then the target clearly requires revision based on the new and more credible population estimate.

3 | IS THE TARGET BEING MET?

The Australian Government commissioned research into the national effort toward feral cat control, primarily to estimate the number of cats culled in Australia over a 12-month period (Garrard et al., 2017). As highlighted by Woinarski, Morris, and Ritchie (2015), and detailed in Garrard et al. (2017), a robust calculation of the number of feral cats culled over the entire Australian continent is incredibly challenging, if not unobtainable. Drawing on multiple data sources, it was conservatively estimated that 211,560 cats (95% confidence interval [CI] 135,522–287,598) were culled in Australia in 12 months in 2015–2016 (Garrard et al., 2017). The underlying assumptions used to calculate these figures are detailed in Garrard et al. (2017). This estimate has been used to report that the year 1 target to cull 150,000 cats was achieved (Commonwealth of Australia, 2016). However, responses to an online survey of individuals engaged in feral cat control suggested no substantial change in control efforts through time (Garrard et al., 2017). Hence, while the Government can claim that the year 1 target has been met, it seems likely it was routinely being met already, despite the Government's policy and additional investment. Correspondingly, it seems unlikely that meeting this target will result in demonstrative change in the condition of Australian ecosystems and threatened species (cf. “business as usual”). Substantial increases in control effort and efficacy will be needed if the year 3
and 5 targets of 1 and 2 million cats culled nationally are to be met.

Even if the culling targets are met, they may have little enduring impact on populations of cats or threatened species. A major challenge of controlling feral cat populations is their high reproductive rate and reinvasion potential (Jones & Coman, 1982; Lazenby, Mooney, & Dickman, 2014). Reducing the density of feral cat populations requires the annual removal of an estimated >57% (95% CI 24–93%) of the individuals in a population (Hone, Duncan, & Forsyth, 2010; Short & Turner, 2005). Therefore, in order for feral cat control to be effective, it needs to be intense, sustained over time, and conducted over large areas (Algar, Onus, & Hamilton, 2013; Leo, Anderson, Ha, Phillips, & Ha, 2018). Of the estimated 211,560 cats culled, 75% were attributed to shooting by farmers and hunters/shooters (Garrard et al., 2017). Although shooting (often paired with trapping) can impact local cat populations and significantly reduce closed populations on islands or within fenced reserves, immigration from unmanaged populations or stray cats reduces the impact of shooting on feral cat populations under most circumstances. Given the diffuse nature of shooting by farmers and hunters, it seems unlikely that the rate of culling or extent of cat population reduction could keep pace with rates of net immigration, compensatory breeding, and/or intrinsic rates of population growth (Lazenby et al., 2014; Marlow, Thomson, Rose, & Kok, 2016; Short & Turner, 2005). Broad scale, high-intensity poison baiting of cats has higher potential to facilitate threatened species recovery in unfenced landscapes (Algar et al., 2013; Comer et al., 2018), but this method accounted for just 1.1% of the reported control (Garrard et al., 2017). Thus, it is likely that most of the control effort was not at a high enough intensity to reduce feral cat populations to an extent where predation pressure was lowered enough to facilitate threatened species recovery.

An additional consideration is the complexity of relationships between predator and prey abundance. A reduction in cat numbers may not directly translate into reductions in predation rates, nor increases in prey populations (Spencer, Van Dyke, & Thompson, 2016, 2017), especially if control does not remove “problem” individuals that have a disproportionate impact on prey populations (Moseby, Peacock, & Read, 2015; but see Swan, Redpath, Bearhop, & McDonald, 2017). Finally, in order for cat control to directly benefit threatened species, it also needs to be concentrated on high-priority areas that contain—or could contain—populations of threatened species that are negatively affected by cats (Dickman, Denny, & Buckmaster, 2010). The degree to which the reported control efforts overlap with high-priority areas is unknown.

Other feral cat targets in the Threatened Species Strategy are more closely linked to direct conservation benefits, and progress is being made toward achieving them. The target to eradicate cats from five islands is on track, with eradication planned, in progress, or complete at Christmas, Dirk Hartog, French, Kangaroo, and Bruny Islands (Department of the Environment and Energy, 2017). New cat-free fenced exclosures are being established at Newhaven Sanctuary and Mulligans Flat, and the Government reports that progress has been made toward other exclosures, although it is unclear where these are and what has been done (Department of the Environment and Energy, 2017). Legge et al. (2018) reported that six additional future fenced areas are planned or underway (Mallee Cliffs, Mallee Refuge, Pilliga, Tiverton, Wandiyali-Environa, and Wild Deserts), but it is not known publicly if any of these are related to the Threatened Species Strategy. The year 1 target for 1 million hectares of best practice cat control was achieved, but further progress toward the year 3 and 5 targets of 5 and 10 million hectares has not yet been reported (Commonwealth of Australia, 2016; Department of the Environment and Energy, 2017). Likewise, progress toward the year 3 and 5 targets of best practice feral cat control on 1 and 2 million hectares of Commonwealth land has not yet been reported (Department of the Environment and Energy, 2017). Similar to the 2 million cat culling target, the degree to which meeting these area-based targets will benefit threatened species is unclear because no link has been made to the efficacy of these actions in terms of either reduced cat or increased threatened species population densities.

One approach for developing meaningful targets is the SMART approach—targets that are Specific, Measurable, Ambitious but Achievable, Relevant, and Time-bound. The 2 million cat culling target fails on at least three of these criteria and we suggest the following improvements. First, if the overall goal of the target is to improve the plight of threatened species, then the indicators used to monitor progress toward that goal should relate to both (a) cat distribution, abundance, and density, and (b) the population size or conservation status of threatened species. This would make the target more measurable and relevant. Although the Strategy does have targets for improved population trajectories for 40 threatened bird and mammal species, no link is made between cat control effort and those population outcomes. Aside from the islands and fenced areas covered by the other targets, the culling target could also specify locations (e.g., high-priority conservation sites) where cats should be culled, which would make the target more specific and enable enhanced reporting against the threatened species population trajectory targets. The island eradication and cat-free exclosure targets are more closely aligned with the notion of SMART targets and more clearly linked to positive outcomes. Achieving those targets would make a small contribution to the overall culling target. The targets and actions of the Threatened Species Strategy could also be improved by acknowledging the role of nonlethal approaches for reducing cat impacts (Doherty & Ritchie, 2017), including reducing introduced rabbit populations (Pedler et al., 2016) and implementing appropriate
4 | WHY FOCUS ON CATS TO CONSERVE THREATENED SPECIES?

Similar to the Predator Free New Zealand initiative (Linklater & Steer, 2018), Australia’s Threatened Species Strategy has been criticized for its overwhelming focus on cats compared to other threatening processes that endanger large numbers of plant and animal species, especially habitat loss (Cresswell & Murphy, 2017; Evans et al., 2011). Although the strategy mentions feral cats more than 70 times, habitat loss and fragmentation are conspicuous by their near absence. Land clearing is a politically sensitive issue because significant economic interests (agriculture, urban development, and mining) are the main drivers of habitat loss (Curtis, Slay, Harris, Tyukavina, & Hansen, 2018; Evans, 2016; Reside et al., 2017). The Threatened Species Strategy does not explicitly address these threats, mentioning habitat loss just twice and land clearing not at all. This is concerning given Australia already has one of the world’s worst rates of land clearing, which has increased in some areas recently (Evans, 2016; Reside et al., 2017). A focus on feral cats is warranted (if the focal actions will be effective), but not in the absence of adequately addressing other key threats to biodiversity. A comprehensive, integrated approach toward threatened species conservation is essential, especially because habitat modification may interact with the presence of invasive predators (cats and foxes) to increase losses of native species (Didham, Tylianakis, Gemmell, Rand, & Ewers, 2007; Doherty, Dickman, Nimmo, & Ritchie, 2015).

It is possible that a focus on feral cats serves as a high-profile target that distracts attention away from more politically sensitive issues (e.g., climate change and habitat loss). Indeed, scientific technicality in public policy can mask what are actually ideologically based decisions (Campbell et al., 2014; Merry, 2011). The issues we describe above were known about before the targets were set, and notably Woinarski et al. (2015) explicitly recommended that a culling target should not be set. Of added concern is that the culling target also seems to ignore well established principles for pest animal management, including the need to monitor and measure the efficacy of control actions through time, especially with regards to the population responses of threatened species (Hone, 2007).

Despite the lack of a strong scientific foundation for the 2 million feral cat target, we do not entirely discount its value because targets can perform beneficial auxiliary functions, such as raising awareness, building partnerships, and increasing investment (Doherty et al., 2018). The focus on cats in the Threatened Species Strategy may have raised public awareness about the impacts of cats and instigated other actions, such as the declaration of feral cats as an established pest animal in the State of Victoria. Increased industry investment and the development of new technologies may also be partly due to the Government’s focus on feral cats. However, it is difficult to know which, if any, of these things arose as a result of the target, and which would have occurred in its absence.

Understanding how environmental targets relate to broader policy agendas and on-ground management will become increasingly important as further national (Environment and Climate Change Canada, 2016; Russell, Innes, Brown, & Byrom, 2015) and international targets are developed and implemented, including the Post-2020 Framework of the Convention on Biological Diversity (https://www.cbd.int/post2020/). The perception of frequent trade-offs between the economy and the environment may lead governments to create targets that give the impression of conservation action while avoiding other drivers of species’ decline whose management is more politically sensitive (Kearney & Farebrother, 2014; Russell-Smith et al., 2015; Sabalow, 2016).

With regards to feral cats, we are concerned that progress toward meeting the culling target will be mistakenly interpreted by the general public as equating to direct positive outcomes for threatened species conservation. Yet, the cat culling target is not a direct indicator of conservation action and success. Rather, it is a highly visible symbol of a broader campaign around feral cat research and management in Australia. This acute focus on feral cats may distract attention away from other key threats to biodiversity that have largely been overlooked in the Threatened Species Strategy, especially habitat loss.

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