Game and Feral Animal Legislation Amendment (Conservation Hunting) Bill 2025

Submission to an inquiry by the NSW Standing Committee on State Development

Invasive Species Council

August 2025

Document details

Invasive Species Council. 2025. Game and Feral Animal Legislation Amendment (Conservation Hunting) Bill 2025: Submission to an inquiry by the NSW Standing Committee on State Development. Invasive Species Council. August 2025

About the Invasive Species Council

The Invasive Species Council was formed in 2002 to advocate for stronger laws, policies and programs to keep Australian biodiversity safe from invasive plants, animals, pathogens and other invaders. It is a not-for-profit charitable organisation, funded predominantly by donations from supporters and philanthropic organisations.

Inquiries

Invasive Species Council
Address: PO Box 818, Katoomba NSW 2780, Australia
ABN: 27 101 522 829
Web: invasives.org.au
Email: contact@invasives.org.au

Contents

SUMMARY

The NSW Parliament should reject the Game and Feral Animal Legislation Amendment (Conservation Hunting) Bill 2025 for the following reasons:

1. The 'Conservation' Hunting Bill is based on a misleading premise that recreational hunting is effective for controlling invasive vertebrates. Recreational hunting is not effective, so does not count as conservation.
2. The Hunting Bill provides mechanisms and resources for recreational hunters to undermine effective control of invasive vertebrates, particularly on public lands.
3. The Hunting Bill carries significant governance and reputational risks for the NSW Government.

If recreational hunting was an effective way of managing invasive vertebrates, the Invasive Species Council would welcome this bill. **To understand why we oppose the bill, it is important to understand the differences between recreational hunting and volunteer shooting in coordinated control programs:**

- recreational hunting – an ad hoc activity focused on the pursuit of 'game' animals for reasons such as obtaining meat or trophies, the thrill of the chase, or being outdoors
- volunteer shooting – a directed activity to help achieve specified conservation outcomes as part of a coordinated control program.

The Hunting Bill concerns the first category and is not necessary or helpful for supporting the integrated use of skilled volunteer shooters in coordinated control programs.

It is also important to understand the history of the shooting lobby in NSW, and in other states, in undermining effective control of invasive species over at least the past two decades, including by:

- opposing the listing of deer as a pest animal in NSW, continuing to oppose pest declarations in Victoria and Tasmania, and opposing the SA deer eradication program
- through the Game Council and political advocacy, undermining effective control by government agencies of feral deer in NSW, allowing them to spread out of control
- seeking to undermine the social license for aerial shooting and baiting programs
- influencing the management of most state forests in NSW to restrict feral animal control, so that they effectively function as game parks for recreational hunters.

FALSE PREMISES: A bill based on biological fallacies

The NSW Government has published many guidelines on effective control of invasive species and has many experts to advise it, so is well aware that recreational hunting is not an effective control method. Ad hoc recreational hunting breaches every one of the following 6 principles for effective management, which are drawn from well recognised experts, including in the NSW Government.

1. **Effectiveness requires a plan focused on achieving defined conservation outcomes**
    - An effective control program is based on an evidence-based plan with clear outcome-focused goals and measurable objectives.

- Recreational hunting is mostly ad hoc, not guided by any plan or focused on defined and realistic outcomes.

2. **Effectiveness requires application of biology and ecology**
   - Effective population control requires the removal of invasive animals at a rate exceeding their capacity for population recovery. The potential for perverse ecological consequences such as predator release needs to be considered.
   - Recreational hunting is largely ineffective because too few animals are killed to exceed the potential for populations to quickly rebound.
3. **Effectiveness requires the use of effective methods and competent operators**
   - Effective control requires the integrated use of effective methods and operator skill is crucial. Population knockdown to substantially reduce densities typically requires the use of 'primary' techniques like aerial shooting and lethal baiting. Ground shooting is rated by the NSW Government as ineffective for controlling foxes, pigs, goats, and rabbits, and of limited or variable effectiveness for feral deer and cats.
   - Recreational hunters use ineffective control methods and their skill levels are highly variable. A global review of ground shooting found that coordinated operations using volunteer shooters or recreational hunters mostly failed to achieve their objectives while those using government or contracted shooters mostly succeeded.
4. **Effectiveness requires adequate resources and technical capacity**
   - Effective control relies on sufficient, long-term funding, the availability of effective control technologies and the advice of experts to design an effective program.
   - Recreational hunting is not designed or intended for efficient control. Public resources should not be wasted on ineffective programs or activities.
5. **Effectiveness requires monitoring, evaluation and adaptation**
   - An effective control program needs to demonstrate effectiveness by regular monitoring and evaluation of progress on objectives, not just control effort, and adapt if objectives are not being achieved.
   - Recreational hunting lacks measurable conservation objectives; simply tallying animals killed is not a meaningful measure of outcomes.
6. **Effectiveness should be coupled with a commitment to avoid or minimise animal suffering**
   - Effective management aims to minimise animal suffering, which is highly dependent on operator skill and the use of methods that substantially reduce population densities and therefore the number of animals that need to be killed over the long-term.
   - Recreational hunting, due to variable skill levels and ineffectiveness in reducing populations, sustains long-term culling and compromised animal welfare outcomes.

The ineffectiveness of recreational hunting for control is exemplified in state forests. The numbers of animals killed by recreational hunters across more than a million hectares of state forests – an average of about 15,000 animals of >10 species over the 3 years to mid-2024 – are too small to bring any conservation benefits.

The proposed label of 'conservation hunting' is inaccurate and offensive to experts and participants in genuine conservation efforts and control programs.

CONSERVATION RISKS: A bill to undermine effective control of invasive animals

Although some hunters are motivated to contribute to invasive animal control, other hunters are primarily interested in expanding and sustaining hunting opportunities and oppose effective control programs. The Hunting Bill will provide opportunities for the hunting lobby to undermine invasive vertebrate control, particularly on public land, using several levers of influence:

- **Elevated status and prominence for a minor recreational sector**: The Hunting Bill grants significant prominence and influence to recreational hunting, despite it being practiced by only 0.3% of the NSW population (based on the number of licenced hunters on public land). The proposed Conservation Hunting Authority would provide the hunting lobby with a misleading status as experts on conservation and invasive vertebrate control.
- **Creation of a propaganda platform for hunting**: The Hunting Bill mandates the promotion of recreational hunting as both a form of conservation and a cultural practice, with public funding for these functions coming from the Game and Pest Management Trust Fund.
- **Creation of a right to hunt:** This unwarranted co-option of the concept of cultural rights, combined with obligations on public land managers and an amendment of the Forestry Act to require promotion of hunting as a use of state forests, would elevate the interests of a small group of public land users over other users.
- **Pressure on public land managers to facilitate and favour hunting**: The Hunting Bill would impose obligations on most public sector land managers to proactively consider facilitating hunting and to consider the implications of their land management decisions for hunters – including control programs, which when effective reduce the availability of 'game' animals for hunting.

Elevating the influence of hunting groups is likely to undermine effective control of invasive animals. Granting the Hunting Authority the power to influence the management of public lands is likely to create impediments to effective control, propagate fallacies about control, risk the transformation of public lands into game reserves, and divert scarce public funding from effective control programs.

GOVERNANCE RISKS: A bill with reputational and legal pitfalls

The Hunting Bill will undermine the credibility of the NSW Government on invasive animal control, potentially promote potential breaches of the general biosecurity duty, and foster social conflict.

It conflicts with government policy and the advice of genuine government experts on invasive species management. If public land managers accept the Hunting Authority's advice that hunters are effective for invasive vertebrate control, they risk breaching their general biosecurity duty under the Biosecurity Act. The Bill is also likely to engender inequities and social conflict by elevating the 'rights' of hunters over other public land users and by applying the 'conservation hunting' label.

The Hunting Bill violates principles of effective regulation and conflicts with existing government policies. It violates NSW's 'Better Regulation principles' by failing to establish a credible need for government action and by failing to demonstrate that the bill is in the public interest. The Hunting Bill cannot solve the problem of conservation damage caused by invasive animals and its real objective is inconsistent with government objectives and policies.

RECOMMENDATIONS

1. In recognition of the substantial differences between recreational hunting of 'game' and effective control of invasive vertebrates, reject the inaccurate label of 'conservation' for recreational hunting licences or bodies.
2. Reject the proposal for a publicly funded or government-endorsed platform that enables hunting organisations to perpetuate false claims about invasive vertebrate management.
3. Promote the principles for effective management of invasive animals, codes of practice and standard operating procedures, and commit to funding only programs that meet these standards.
4. Reject any provisions that elevate the interests of recreational hunters over other users of public land. The NSW Government should not grant preferential rights or influence to a single, minority interest.
5. Remove any provisions that provide preferential rights or avenues for recreational hunters to influence public land management.
6. Reject the concept of a 'right to hunt'. This grants unwarranted influence to a minor recreational sector over the management of public lands and places an unnecessary burden on public land managers.
7. Ensure all decisions regarding invasive animal management on public lands are based on scientific evidence and expert advice from qualified conservation professionals, not recreational hunting lobbies.
8. Make explicit the obligations of public land managers for invasive species control – to satisfy the general biosecurity duty and to enable the NSW Government to meet conservation goals and targets. The obligations should include requirements for:
    a. mapping and reporting on invasive animal presence and density
    b. developing an invasive animal management strategy and outcome-focused control plans
    c. implementing control using the most effective and humane methods and monitoring
    d. publicly reporting on the outcomes of control programs.
9. Reject the Hunting Bill in entirety – and instead strengthen existing professional control programs that:
    a. comply with NSW's codes of practice and standard operating procedures
    b. operate within best-practice governance frameworks
    c. serve the public interest in environmental protection and public land management.

1. INTRODUCTION

Protecting native species and ecological communities from the threat of invasive animals is one of Australia's most difficult, expensive and important challenges – essential for stopping extinctions, species declines and landscape degradation. If recreational hunting was an effective way of managing invasive animals, the Invasive Species Council would welcome the Game and Feral Animal Legislation Amendment (Conservation Hunting) Bill 2025 (the 'Hunting Bill').

But the Hunting Bill is not focused on solving invasive species problems. It is intended to benefit and increase the influence of one recreational sector. It will grant those who represent recreational hunters – mainly the 0.3% of the NSW population licensed to hunt on public lands – an outsized, likely harmful, influence over the management of public land and invasive vertebrates.

As an advocacy organisation focused on protecting native biodiversity from invasive species, our primary concern is that the Hunting Bill will do the opposite of what its name implies and undermine conservation. In this submission we argue that the Hunting Bill should be rejected for at least the following reasons:

- The bill is based on a false premise: that recreational hunting is effective for control of invasive vertebrates and therefore counts as a conservation activity (section 2).
- The bill provides mechanisms and resources for recreational hunters to influence and undermine control programs, particularly on public lands (section 3).
- The bill carries significant governance and reputational risks for the NSW Government (section 4).

It is important to note that we distinguish in this submission between:

A. Recreational hunting – an ad hoc activity focused on the pursuit of 'game' animals for reasons including obtaining meat or trophies, the thrill of the chase, a reason to be in the outdoors. It can also be motivated by conservation or agricultural concerns, but motivations are distinct from outcomes.

B. Volunteer shooting – a directed activity intended to contribute to achieving specified conservation outcomes as part of a professional control program – for example, the supplementary pest control program in national parks operated by the National Parks and Wildlife Service [1].

The Hunting Bill is about the first category and is not needed for supporting the integrated use of skilled volunteer shooters in coordinated control programs, such as the NSW national parks program or South Australia's Bounceback program (Box 1).

Box 1. Volunteer shooting as a potential contribution to effective control programs

Where ground shooting is an effective method for invasive animal control – mainly as a supplement to other control methods such as aerial shooting and toxic baiting – skilled volunteer shootings can potentially play a valuable role. Unfortunately, the only published example we can find of this is the Bounceback program in South Australia.

In the Flinders Ranges, the Conservation and Wildlife Management Branch of the Sporting Shooters Association of Australia (SSAA) has contributed to effective programs to reduce feral

goat, fox and cat populations as part of Bounceback – a coordinated program run by the South Australian Government in partnership with the Arid Lands Natural Resource Management Board and numerous other organisations. The success of volunteer shooters has been attributed to 'high standards of training and field operations' [2].

The SSAA differs from some other hunting groups in recognising the difference between recreational hunting and effective control programs [3]:

- Skill: SSAA members who participate in the Farmer Assist program 'have all achieved a skill competency equivalent to professional shooter training'.
- Integration of control methods: The SSAA supports the integrated use of a variety of methods such as shooting, trapping and poison baiting to control invasive species populations.

2. FALSE PREMISES: A bill based on biological fallacies

The NSW Government well knows that recreational hunting is not an effective method of invasive animal control. It has published numerous documents outlining the requirements for effective management and specifying the limitations of ground shooting and recreational hunting [4–10]. It also employs numerous experts on controlling invasive animals who, if permitted to speak freely, would advise that the potential contribution of recreational hunting to invasive animal control is very limited.

Yet the NSW Government is supporting a bill based on the premise that ad hoc hunting is an effective method of control and therefore counts as 'conservation'. This is based on the biologically bogus claim that all it takes to control invasive animals is to kill some – and that every animal killed by a hunter is therefore a contribution to conservation.

In this section we explain what is needed for effective control of invasive vertebrates and how ad hoc hunting fails on every principle and criterion. Hunting fails because it is a fundamentally different activity from the control of invasive vertebrates for conservation, based on very different motivations (Box 2).

Box 2. Some motivational differences between recreational hunting and controlling invasive vertebrates

Although the same animals may be targeted, the activities are driven by different values, motivations and guiding principles, which lead to different outcomes.

The 'ethics' of a 'fair chase': The Victorian Game Authority says 'a true hunter makes every effort to ensure the contest is as fair as possible' – which means 'giving the game a sporting chance' to get away [11].

> The skills used by the recreational hunter to find the quarry, and how that quarry is killed, are more important than whether the quarry is killed [12].

This conflicts with effective management of invasive vertebrates, which is focused not on 'the chase' but on the most efficient and humane way to achieve threat reduction.

Invasive animals as a valued resource: 'Game' animals are valued as a resource – meat, trophies or a sporting challenge – whereas 'invasive' animals are regarded as a regrettable presence and a threat to what is valued.

Sustainable harvesting: For many hunters, maintaining 'healthy' populations of game animals to provide hunting opportunities represents sustainability:

> … we bagged four sows … All were of prime condition and all of them were in pig and close to dropping, so of course all were released for future research!!! [13]

In contrast, the sustainability goal for conservation is elimination or major reductions of invasive animal populations.

Acceptable methods: Those who want to sustain game populations for hunting or regard hunting atavistically as 'a way to connect with one's heritage as a predator' [14] are likely to oppose efficient control methods such as aerial shooting or baiting – as exemplified by this 2024 Victorian petition [15]:

> The petition of certain citizens of the State of Victoria draws to the attention of the Legislative Council that aerial culling of deer in areas that can be hunted by recreational hunters needs to end. … Aerial culling of deer … is being conducted in areas where recreational hunters have paid license fees to hunt deer. With fees set to increase, this is even more insulting as hunters are expected to pay more for less opportunities.

	Recreational hunting	Conservation control
Perception of animal	A resource – 'game' animal	A threat – 'invasive' animal
Main motivations	An outdoor experience, honing of skills, harvest of meat or trophies	Mitigation of threats to native wildlife and ecosystems
Long-term goal	Healthy 'game' populations	Elimination or reduction of invasive animal populations
Ethics	Fair chase – a test of skills	Effective and humane control

2.1 What is needed for effective management of invasive animals and why does recreational hunting fail?

Before about 1990, the main goal of invasive animal management in Australia was to kill as many as possible [4,16]. Despite decades of this, including laws compelling landowners and bounties to subsidise the killing, most invasive vertebrate threats remained potent or worsened [17].

In 1993, the Bureau of Rural Sciences published a review of pest management in Australia that precipitated a paradigm shift from 'just killing pests' to a strategic approach focused on reducing their damage to defined 'assets' and monitoring effectiveness against the objective [16,18].

But that old idea that invasive animal problems can be overcome simply by increasing the numbers killed remains pervasive in Australia – as demonstrated by the premise underpinning the Hunting Bill

and the surviving faith in bounties. It is hard for many people to believe that killing can be futile for controlling invasive animals or mitigating their threats.

There are 3 choices with invasive species management – do nothing, do something, or do something useful. A destined-to-fail 'do something' approach can be worse than the 'do nothing' option, because it leads to futile killing, pointless animal suffering, and wasted public and private resources. Yet it remains an all-too-common choice – made in ignorance of population biology or from political opportunism, or because the real goal is killing animals rather than reducing a threat.

Following are 6 overarching principles of effective management of invasive vertebrates – applicable to the dozen or so species typically targeted by recreational hunters. We have drawn the principles from several well-regarded publications born of decades of experience with invasive species biology and management – particularly the NSW Government's nationally endorsed codes of practice and standard operating procedures [19], Baysher 2017 [17], Hone 1999, 2010 [20,21], Bengsen et al. 2020 [9] and the National Parks and Wildlife Service *Feral Animal Management Strategy* 2025 [22].

Because the Hunting Bill is ostensibly aimed at improving conservation outcomes, our focus here is invasive animal control for conservation purposes. We mostly refer to 'invasive vertebrates' (rather than 'pests', which is more of an agricultural term) and frame effective management in terms of abatement of threats to biodiversity. But the principles are also applicable for programs focused on reducing agricultural damage. As noted in the introduction, the observations here about recreational hunting are not about skilled volunteer shooters who participate in coordinated effective control programs (Box 1).

Principle 1: Effectiveness requires a plan to achieve defined conservation outcomes

> *Rather than focussing on inputs, it is now realised that like most other aspects of agriculture or nature conservation, pest management needs to be carefully planned and coordinated with the aim of reducing to an acceptable level the damage due to pest animals i.e., the focus is on measurable economic and environmental outcomes.*
>
> NSW codes of practice and standard operating procedures [19]

1A. Develop a plan

Effective management needs a well-considered, evidence-based plan, with clear goals and measurable objectives. For NSW's national parks, the National Parks and Wildlife Service (NPWS) has a feral animal management strategy framework outlining long-term objectives and supported by implementation plans, standard operating procedures, protocols and other resources [22].

Recreational hunting is mostly ad hoc – not part of any program or guided by any conservation strategy or plan.

1B. Design a program to achieve defined conservation outcomes

Effective management requires a focus on achieving defined and realistic outcomes. Except on islands or within fences, eradication of well-established invasive vertebrates is rarely achievable [17]. The purpose of most invasive animal control therefore should be to prevent or reduce their threat to particular conservation entities or assets to an acceptable level [16]. National park control plans specify density-reduction targets or other impact-driven targets to mitigate damage and achieve

conservation outcomes [22]. Killing invasive animals should be regarded, and evaluated, as a potential means to achieve the outcomes, not as an end goal in itself.

Recreational hunting cannot legitimately be described as a 'conservation' activity unless it is genuinely contributing to a program designed to achieve a conservation outcome. By definition, recreational hunting is driven by a desire for the activity itself – whether because of the thrill of the chase, the potential to obtain meat or a trophy, or even a desire to contribute to conservation. But killing an invasive animal does not in itself count as conservation (for reasons described under principle 2).

1C. Ensure adequate duration and scale

Effective management typically requires a long-term or ongoing commitment, but the aim should be to reduce the level of intervention needed over time to maintain the desired outcome. Short-term programs are usually a waste of resources. A program should also operate at an appropriate spatial scale – whether that be a zone of protection around a threatened species population, an entire national park or region. It often requires cross-tenure control and the maintenance of buffer zones.

Recreational hunting is generally limited to small accessible areas. The duration relies on hunter motivation, which often declines as the population density or detectability of their hunting target declines [9].

Principle 2: Effectiveness requires application of biology and ecology

> *Operations that fail to remove animals from a population faster than they are replaced by births and immigration cannot achieve more than a trivial and short-lived reduction in population density.*
>
> Bengsen et al. 2020 [9]

2A. Base target removal rates of invasive animals on biology

Effective management of an invasive animal needs to be based on population ecology – (a) the level of population reduction needed to achieve a defined conservation outcome (in some cases almost total suppression is needed [23,24]) and (b) the level of removal needed to achieve that threshold level of population reduction [25]. Population reduction is possible only when animals are removed at a rate exceeding their capacity for population growth – by reproduction, immigration and increased survival. This can require killing more than half or three-quarters or more of an invasive animal population annually (Figure 1) [20,21]. Invasive animal populations often have a large 'doomed surplus' – young that die due to starvation, for example – which means the killing of some – often the young, inexperienced animals – enables the survival of others that would have otherwise died [26].

Recreational hunting is mostly ineffective, because too few animals are killed to exceed the potential for populations to rebound by increased survival, reproduction and immigration. The relatively small number of invasive animals killed by hunters in NSW state forests exemplifies the ineffectiveness (Table 2, Table 3). To achieve a reduction in fox populations requires the annual removal of probably at least two-thirds (Figure 1), yet over the past 3 years hunters across more than a million hectares of state forest have killed a mere 1,400 a year (Table 2).

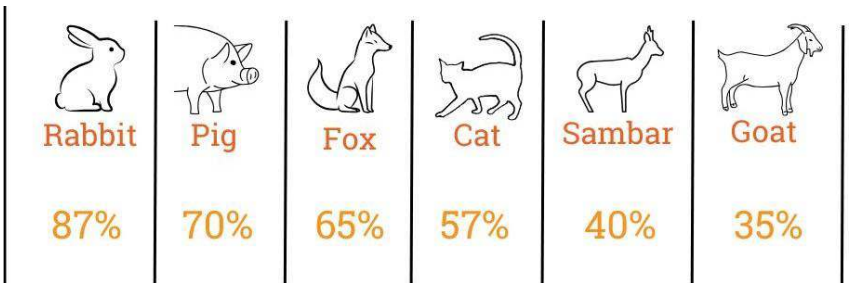

Figure 1. Estimated proportions that may need to be killed annually to prevent population growth

Sources: Hone 1999, 2010 [20,21]

2B. Take an ecological systems approach

Effective management has an ecological foundation, recognising that invasive species are part of complex systems with multiple, often interacting threats. It requires consideration of threats other than the invasive species under control – threats that may prevent achievement of the intended outcome – and the potential for unintended consequences, such as competitive or predatory release of other invasive species when one is controlled [17].

Recreational hunting does not involve consideration of ecological barriers to or consequences of invasive animal control.

2C. Design for long-term success by reducing the need for intensive culling

Effective management should be designed to limit the need for intensive culling over time and therefore minimise the number of invasive animals killed. Investing more resources at the start of a program to achieve a large initial population knock-down means fewer resources should then be needed to maintain the population at a low density [9,27]. This 'front-loading' approach minimises total killing over time while optimising conservation outcomes. Models are available to help planners evaluate management options to guide the allocation of effort and resources for best long-term outcomes [28].

Recreational hunting typically sustains long-term culling of animals with little or no potential for achieving significant population suppression. Hunter motivation typically wanes as an invasive animal population wanes.

2D. Maximise efficiency through strategic timing of control

Effective management requires responsiveness to opportunity – so as to exploit times when invasive animal populations are low or particularly vulnerable. This may be seasonal – e.g. during breeding seasons when animals are concentrated – or during drought or after fires when populations are stressed or reduced [27]. This may require flexible funding arrangements.

Recreational hunting occurs according to the preference of hunters, not when it is most efficient for population reduction.

2E. Be ambitious (or experimental) but accept biological reality

Effective management requires accepting sometimes that it is not feasible to reduce an invasive animal population. This should not be an excuse for low ambition, but it is better to not start or continue a program destined to fail – whether from lack of resources, support or available control techniques.

Recreational hunting occurs regardless of effectiveness, with claims of effectiveness based on the false premise that killing even one invasive animal is inherently beneficial for conservation.

Principle 3: Effectiveness requires the use of effective methods and competent operators

> *The techniques used within a control program need to … lead to a maximum population reduction which often requires reducing pest animal densities to low levels over a large scale and maintaining this level of population suppression indefinitely. This leads to a situation where the need for ongoing control is minimised and rates of re-invasion reduced.*
>
> NSW codes of practice and standard operating procedures [4]

3A. Deploy effective and integrated control methods

Effective management requires use of effective control methods deployed singly or multiply, in an integrated way, to maximise population reduction. Primary techniques – mainly aerial shooting and lethal baiting – can achieve rapid population knockdown over large areas, while supplementary less-effective techniques may maintain suppression once densities are reduced [19]. Ground shooting 'is an inherently inefficient method of achieving initial knock-down' [9] and typically, it should only be deployed in a coordinated program as a supplement to more effective methods. Rotation of methods may be needed – for example, when invasive animals adapt to particular techniques (e.g. bait aversion).

Recreational hunting is generally ineffective because of the limited efficacy of ground shooting – rated by the NSW Government as ineffective for controlling foxes, pigs, goats and rabbits, and with limited or variable effectiveness for feral deer and cats (Table 4, section 2.3). Some recreational hunters also oppose the use of effective methods such as aerial shooting and toxic baiting (Box 2).

3B. Ensure operator competency and ethics

Effective management relies heavily on the skill and commitment of the operators [9,19]. A global review of ground shooting found the one factor correlated with whether control operations achieved their stated objective was the type of shooter used – those using government or contracted shooters mostly succeeded but not those using volunteer shooters or recreational hunters [9].

Recreational hunters have highly variable skills and motivations. Unlike a driving licence, a hunting licence is issued with no requirement for a shooter to prove competency. A proportion of hunters are highly skilled – a survey of licenced deer hunters in NSW revealed that just 10% were responsible for 50% of the take – but others are poorly skilled. Almost half (46%) the licenced deer hunters surveyed in 2018 did not kill any deer [29]. In NSW state forests from 2021–22 to 2023–24, it took an average 3 days of hunting for one invasive animal to be killed (Table 3) [30].

3C. Follow best practice guidelines

Effective management requires adherence to standard operating procedures and codes of practice. These guidelines have been developed for most invasive vertebrate species [19]. Programs that breach these guidelines can become ‘sustained culling operations’ that fail to achieve beneficial outcomes and cause significant animal suffering [4].

Recreational hunting is inconsistent with standard operating procedures and codes of practice in several ways – including the limited effectiveness of ground shooting as a method, the variable skill levels of hunters, and the lack of integration within a coordinated program.

Principle 4: Effectiveness requires adequate resources and technical capacity

> *Several studies have reported a history of insufficiently resourced and ineffectual attempts to manage populations.*
>
> Bengsen et al. 2020 [9]

4A. Match funding to program objectives

Effective management requires sufficient funding. Lack of this is one of the most common causes of program failure – worse than not trying because it wastes resources, kills animals futilely and threatens the social licence for control programs. Funders should account for the increasing costs of control as population density declines [9].

Recreational hunters like to claim they offer a free control service, but it doesn't count as a service if it is not effective. For this reason, bounties are a waste of public funding.

4B. Build technical and logistical capacity to aid efficiency

Effective management requires access to expertise, equipment and support systems to maximise efficiency [REF]. This may require hiring contractors and working with research institutions or government agencies.

Recreational hunters, mostly in pursuit of memorable experiences, meat or trophies, are not focused on efficiency and, for safety reasons, are often not permitted to use equipment that aids efficiency.

4C. Do not waste public resources on ineffective programs or activities

Effective management is undermined when governments fund ineffective programs that waste scarce public resources and perpetuate poor practices. Governments should transparently allocate public resources to programs likely to achieve the most beneficial public good outcomes. The cost-effectiveness of different control methods and strategies should be regularly evaluated.

Recreational hunting should not be subsidised from conservation or biosecurity programs, for it is not a useful or optimal use of scarce public funding for control of invasive vertebrates.

Principle 5: Effectiveness requires monitoring, evaluation and adaptation

5A. Monitor and evaluate progress based on program objectives

Effective management requires regular monitoring and evaluation. Monitoring should be designed to measure progress on management objectives rather than simply tracking control effort (e.g. number of animals killed). When this is not possible, measuring the reduction in abundance of the targeted animal can be a useful proxy if the relationship between abundance and damage is known [17]. Monitoring data should be used to refine understanding of population dynamics, control effectiveness and cost-efficiency, and modify approaches to improve outcomes [9,17].

Recreational hunting lacks measurable conservation objectives. The tallying of animals killed is not a meaningful measure of conservation outcomes, particularly when there is no baseline population data.

5B. Report transparently on program outcomes

Effective management should involve regular, transparent reporting, which demonstrates a commitment to continuous improvement, builds trust with stakeholders and contributes to professional learning. Acknowledge both successes and failures and contribute to the broader knowledge base for invasive species management.

Recreational hunters do not measure or report on conservation outcomes.

Principle 6: Effectiveness should be coupled with a commitment to avoid or minimise animal suffering

> *From an animal welfare perspective, it is highly desirable that pest animal control programs are efficient, effective and sustained so that pest populations are reduced to low levels and not allowed to recover, thereby avoiding the need for repeated large-scale killing.*
>
> NSW codes of practice and standard operating procedures 2022 [4]

6A. Minimise animal suffering

Effective management needs to focus on minimising the suffering of animals, whether native or not – for the sake of the animals themselves and to maintain the social acceptability of control programs and techniques. The humaneness of any technique is 'is highly dependent on the way the technique is applied and on the skill of the operator involved' [4]. Ground shooting can be a 'humane method' but only when [6]:

> … it is carried out by competent, accurate and responsible shooters; the correct combination of firearm and ammunition and optimum shot placement are used; the target animal can be clearly seen and is within range; and all wounded animals are promptly located and euthanased humanely.

It is important also to search for and humanely euthanase young after their mother is shot [6].

When multiple effective control options exist, methods should be selected that minimise animal suffering – based on advice in the NSW Government's codes of practice and standard operating procedures [19]. Sometimes, conservation requires a trade-off with animal welfare – for example, in the use of 1080 baits to protect endangered species from foxes when there are no effective replacements [31]. For both animal welfare and conservation, governments should invest as a priority in research on humane and effective methods.

Recreational hunting can cause minimal animal suffering when carried out by skilled, ethical shooters, but there are no competency requirements to gain a hunting licence, and skill levels and ethics are variable.

6B. Recognise the welfare-effectiveness connection

Effective management minimises total animal suffering over time by achieving meaningful population reductions of invasive animals that eliminate the need for repeated, large-scale culling. Incompetence and ineffectiveness perpetuate both conservation and animal welfare problems [19].

Recreational hunting, because it is mostly ineffective in reducing invasive animal populations, does not maximise animal welfare. Reducing invasive animal populations conflicts with the motivations of some hunters to maintain 'sustainable' populations of invasive animals and 'fair chase' ethics (Box 2).

Important questions to inform decision-makers about the differences between recreational and effective control of invasive vertebrates

1. Is recreational hunting consistent with the NSW Government's codes of practice and standard operating procedures for pest control?
2. Has the NSW Government undertaken any analysis of the effectiveness of recreational hunting for invasive vertebrate control, mindful of the distinction between recreational hunting and volunteer shooters participating in coordinated control programs?
3. What are the rules and principles that guide the use of 'highly skilled' volunteer shooters in the NSW Government's supplementary pest control program in national parks? What level of competence is required for participation in the program? How effective has the program been at achieving conservation outcomes?
4. Have NSW government experts on invasive vertebrate control been asked to provide any advice on the Hunting Bill or the proposed bounties regarding:
    a. the effectiveness of recreational hunting for invasive animal control for conservation outcomes
    b. whether promoting recreational hunting as a 'conservation' activity is consistent with the NSW codes of practice and standard operating procedures.

2.2 Is recreational hunting in NSW state forests achieving conservation outcomes?

2.2.1 Invasive animal control in state forests

The Forestry Corporation of NSW manages 2.2 million hectares of public land, mainly state forests, on behalf of the NSW Government. Despite this vast estate, including a million hectares under protection for conservation, the corporation publishes no strategies for invasive animal management and provides no meaningful information about invasive species threats, populations or management. The only available information about invasive vertebrate management in state forests is expenditure for fox and dingo control [32].

The recent release of the National Parks and Wildlife Service's 'Feral animal management strategy' – detailing the objectives and approaches for reducing the threat of invasive vertebrates in national parks – provides a telling contrast [22].

There is also much less spent on weed and pest management in native state forests (managed by the hardwoods division) than in national parks. The per-hectare expenditure by Forestry Corporation was only 11% of that by the National Parks and Wildlife Service, even though most native state forests are meant to be protected for conservation (Table 1).

There have been no published studies of the threats of invasive vertebrates in state forests or the effectiveness of management. But the Natural Resources Commission in its 2016 review of pest management noted that the amount spent on pest and weed control in state forests may be insufficient to meet the Forestry Corporation's general biosecurity obligations under the NSW

Biosecurity Act 2015. It also noted that deer management in state forests was 'uncoordinated' and 'opportunistic' and not occurring at all in some forests [33].

2.2.2 The influence of hunting in state forests on invasive animal control

Of the 441 state forests covering >400 hectares (totalling 2.1 million hectares) [34], the NSW Government redeclared 351 for hunting in January 2024, and 224 were open to hunting in August 2024 [30]. The area open to hunting is not specified, but likely exceeds a million hectares.

The only recreational hunting outcomes reported for NSW state forests – annual numbers of animals killed across all forests open to hunting (Table 2) – are meaningless for evaluating whether this contributes to invasive vertebrate control. Such numbers indicate nothing about changes in population density of the targeted species or the harm mitigated.

Despite the lack of data, the numbers of animals reported killed by recreational hunters – an annual average of about 15,000 animals of >10 species over the 3 years to mid-2024 – are so small compared to the likely numbers in state forests, it is safe to conclude that recreational hunting has brought no conservation benefits for NSW state forests (Table 2). The most common animals killed were pigs (4,300 on average) and rabbits (3,500 on average), making up about half the total. For both species, ground shooting is rated by the NSW Government as ineffective for population control [6,8] (Table 4).

Indicative of the limited effectiveness of recreational hunters, on average in 2023–24 it took about 3 hunting days to kill one animal, and each licenced hunter killed on average less than one animal a year (Table 3).

The limited invasive vertebrate control undertaken by Forestry Corporation, focused mainly on dingoes [32,35], suggests that the corporation may consider or accept recreational hunting as a substitute for coordinated control programs. We understand there has been an effective ban on aerial shooting in state forests for many years, with infrequent exceptions mainly in the western region, due to interventions by DPI's Game Unit on the basis of implications for hunter amenity.

But the Forestry Corporation understands that hunting is no substitute for proper programs, as it acknowledged in the 2016 NRC review of pest management [33]:

> … one obvious challenge [is] the difference between recreational aspects of hunting, e.g. selective taking of animals such as deer, and what is required to actually control pests, e.g. heavy culling.

The limited control of invasive animals in state forests and the failure of forest managers to use effective methods of control indicates that recreational hunting is an impediment to effective control rather than beneficial. The pressure on Forestry Corporation to maintain optimal hunting opportunities for recreational hunters highlights the risks of increasing access to other public lands and granting even more influence to hunters over public land management.

Table 1. Expenditure on invasive species control, including weeds, on NSW public lands, 2022–23

Public land type	Area (million ha)	Expenditure 2022–23 ($ million)	Average expenditure ($/hectare)
Native state forests (hardwoods division)	1.8	1.25	0.69
State forest plantations (softwoods division, noxious animal control only)	0.4	0.31	0.85
National parks	7.0	47.18	6.74
Crown land reserves managed by the NSW Government directly	1.0	3.8	3.80
LLS on travelling stock reserves	0.5	4.32	8.64

Sources: NSW Forestry Corporation 2024 [32], NSW Natural Resources Commission 2024 [36]

Table 2. Animals killed by recreational hunters in state forests, 2021–22 to 2023–24

Species	2021-22	2022-23	2023-24	Annual average	% total average killed
Pigs	3,893	4,054	4,982	4,310	28.2%
Rabbits	3,625	3,277	3,470	3,457	22.6%
Deer	2,487	3,137	3,417	3,014	19.7%
Goats	1,341	1,797	2,273	1,804	11.8%
Foxes	1,189	1,450	1,502	1,380	9.0%
Hares	903	650	790	781	5.1%
Cats	349	424	426	400	2.6%
Dogs/dingoes	127	169	188	161	1.1%
Totals	**13,914**	**14,958**	**17,048**	**15,307**	**100%**

Source: NSW Department of Primary Industries 2024 [30]

Table 3. Recreational hunting effort in NSW state forests

Year	Restricted license holders	Hunting days in state forest	State forest area open to hunting (ha)	Animals killed / licence holder	Animals killed / hunting day	Animals killed / hectare open to hunting
2023-24	23,916	68,076	Not publicly specified	0.7	0.35	No data
2022-23	25,674	61,265		0.58	0.24	No data

Source: NSW Department of Primary Industries 2024 [30]

Important questions to inform decision-makers about the management of invasive animals and the consequences of recreational hunting in state forests

1. What surveys of invasive animal populations, if any, have been conducted in state forests during the past 5 years, and what were the results?
2. What is the damage in state forests being caused by each invasive animal species targeted by hunters?
3. What invasive animal control operations has Forestry Corporation undertaken or commissioned in native state forests for conservation reasons over the past 5 years? For each operation:
    a. When and where did it occur and what species were targeted?
    b. What were the objectives and intended outcomes?
    c. What methods were used?
    d. What were the monitored outcomes and results?
    e. How much did the operation cost?
4. What monitoring of invasive animal populations and what control operations, if any, have occurred in state forest areas open to hunting, and what were the (a) intended outcomes and objectives and (b) monitored outcomes and results of each operation?
5. Have state forest managers been lobbied or advised by hunters, hunter groups or the DPI Game and Pest Management Management Unit to not undertake control operations, including by aerial shooting?
6. What area of state forest has been open to hunting per year over the past 5 years (average number of hectares each year)?
7. What is the area (minimum to maximum number of hectares) allocated to each hunter or hunting group?
8. Does the NSW Forestry Corporation consider recreational hunting to be an effective method for controlling invasive animals and, if so, what is the evidence informing this view?
9. How much has it cost the NSW Government over the past 5 years to (a) administer recreational hunting and (b) undertake enforcement for recreational hunting in NSW state forests?

2.3 Is ground shooting an effective control method?

> *Ground-shooting is an inherently inefficient method of achieving initial knock-down of a target population; numbers of animals killed per unit effort are often much lower than can be achieved using other control tools such as aerial shooting … or poison baiting …, and the area over which intensive control can be applied is often much smaller.*
>
> Bengsen et al. 2020 [9]

Ground shooting is rarely an effective method for controlling invasive animal populations, although sometimes useful as a supplementary technique. In all standard operating procedures for ground shooting, the NSW Government advises its use only 'in a strategic manner as part of a coordinated program designed to achieve sustained effective control' and only when 'performed by skilled operators' [19]. For the invasive animals most commonly targeted by recreational hunters, the NSW Government rates ground shooting as either not effective or of limited effectiveness (Table 4):

- not effective: foxes, rabbits, goats, pigs
- limited effectiveness: feral cats
- effective only in low-density areas: feral deer.

The methods rated by the NSW Government as effective for one or more species included lethal baiting, aerial shooting, mustering, trapping, warren ripping (rabbits) and Judas animals (Table 4).

A global review of the effectiveness of ground shooting based on 64 case studies (ranging from single properties to entire states) found that 'many shooting operations did not achieve a notable decrease in animal abundance or damage' [9]. Success largely depended on the skill of the shooters – 72% that used government agency or commercial wildlife-management contractors met their stated objectives, but only 30% that used unpaid recreational hunters or volunteers did so. The frequent failure of programs using recreational hunters was attributed to [9]:

- hunter motivations being unaligned with operational objectives – e.g. declining interest as the density of the target population declines, a focus on harvesting for meat or trophies rather than population reduction, or resistance to management objectives 'perceived to threaten their resource' or 'in conflict with their hunting ethic'
- variable levels of skill and motivation
- poorly conceived or funded programs being more likely to use volunteers.

Table 4. Effectiveness of control techniques for species targeted by recreational hunters, as rated by the NSW Government in codes of practice and standard operating procedures

Species	Lethal baiting	Aerial shooting	Trapping	Ground shooting	Other
Feral cat [4]	No baits approved for use in NSW	Not feasible	Relatively ineffective	Limited effectiveness	
Feral deer [5]	No baits approved for use in NSW	Effective	Effective in certain situations (e.g. urban areas)	Effective only in low density areas	
Feral goat [7]	No baits approved for use in NSW	Effective	Effective (water trapping)	Not effective	Mustering – effective Judas goats – effective
Feral pig [6]	Effective	Effective	Effective in certain situations	Not effective	Judas pigs – effective
Fox [10]	Effective	Not feasible	Not effective	Not effective	Den fumigation – not effective
Rabbit [8]	Effective	Not feasible	Not effective	Not effective	Biocontrol – variable effectiveness Warren ripping – effective

Box 3. Advice in NSW Government codes of practice and standard operating procedures on ground shooting of invasive vertebrates targeted by recreational hunters

The NSW Government advises that ground shooting 'should only be used in a strategic manner as part of a coordinated program designed to achieve sustained effective control' [19].

Feral pigs [6]:

- often used as a secondary method after initial reduction of high density pig populations by aerial shooting and/or poisoning; only suitable for smaller scale operations
- intensive shooting may reduce local populations, but rarely effective for damage control and not suitable for long-term control
- should not be conducted prior to, or during, any other control program – can disrupt normal feral pig activity and may cause temporary dispersal.

Foxes [10]:

- in control programs, usually done at night from a vehicle with the aid of a spotlight or thermal detection device
- may reduce the local number of foxes or problem animals, but not effective in significantly reducing populations
- most likely to kill young, inexperienced foxes, which may result in enhanced breeding and survival of remaining foxes and increased immigration from other areas

Feral deer [5]:

- in control programs, usually done at night from a vehicle or foot, with the aid of spotlights or thermal imaging/night vision scopes
- can be effective when used intensively as part of a coordinated program; best suited to accessible areas where deer numbers are low

Feral goats [7]:

- only suitable for smaller scale operations in accessible areas with high feral goat populations; optimal during dry seasons or droughts, when goats are forced to congregate around water and feed.
- often used as a follow-up after initial reduction of numbers by mustering or aerial shooting

Rabbits [8]:

- in control programs, sometimes used as an adjunct to other control methods, usually at night with a spotlight
- may be useful when rabbit numbers are already low, but not effective in significantly reducing populations or maintaining them at low numbers.

Feral cats [4]:

- difficult because cats generally avoid human contact
- can only achieve localised and insignificant population reductions or remove problem animals.

Important questions to inform decision-makers about the effectiveness of ground shooting as a control method

1. How effective do NSW Government experts on invasive vertebrate control rate ground shooting as a control method for each invasive vertebrate species targeted by hunters?
2. In control programs conducted on national parks, what are the main methods used and how many animals of each species targeted are removed by each method? How are the methods of control selected for each program? In what circumstances is ground shooting regarded as effective?
3. What are the minimum standards required of ground shooters employed as staff or contractors by the NSW Government.

2.4 Should recreational hunting be labelled 'conservation hunting'?

A conservation label for recreational hunting is highly misleading. As outlined in the sections above, there are significant differences between recreational hunting and what is needed to reduce the threat of invasive vertebrates.

If effective control could be so easily achieved, Australia wouldn't have such damaging invasive problems. An analogy favoured by the former CEO of the Invasive Animals CRC Tony Peacock was that recreational hunting for feral animal control is like fighting bushfires with water pistols.

Recreational hunting meets none of the criteria for effective management of invasive vertebrates (section 2.1), noting the exclusion from this category of skilled hunters participating in coordinated control programs that abide by principles of effective management.

Even if some hunters are motivated by conservation concerns, recreational activity is ad hoc and not designed to achieve a conservation outcome. Claims that hunting in NSW's state forests is beneficial for conservation are contradicted by basic population biology. It is not credible that the annual killing of 15,000 or so animals of >10 species has achieved meaningful population reductions (Table 2). There is no way that the annual killing of 4,300 pigs, 3,500 rabbits, 3,000 deer, 1,800 goats, 1,500 foxes, 800 hares or 400 cats across more than 200 state forests would exceed the capacity of their populations to quickly rebound.

It is legitimate to label hunting as conservation only when, as the NSW Government's standard operating procedures specify, 'highly skilled and experienced' shooters contribute 'in a strategic manner as part of a coordinated program designed to achieve sustained effective control' [4–7,10]. Most hunters are not 'highly skilled', and the Hunting Bill is not needed to facilitate the integration of those who are skilled into control programs where this will contribute to achieving defined outcomes.

Hunting groups, particularly those that mischaracterise recreational hunting as pest control, should not be accorded any role to advise a NSW government minister or public land manager on invasive vertebrate management. Advice should be by experts – of which the NSW Government has many.

As well as the 'conservation' label being inaccurate, it will be offensive to many people in the conservation sector and to expert practitioners of invasive animal control. Instead of supporting this greenwashing, the NSW Government should consistently promote the principles of effective management, based on their existing codes of practice and standard operating procedures, and commit to fund only programs that meet these standards.

Important questions to inform decision-makers about whether 'conservation hunting' is an appropriate label for recreational hunting

1. Do NSW Government experts on control of invasive vertebrates regard recreational hunting as a genuine conservation activity?
2. Should government ministers and public land managers be subjected to advice on invasive vertebrate control by non-experts?
3. Has the NSW Government conducted any analysis of the consequences for mislabelling recreational hunting as conservation for their relationships with genuine conservationists?

RECOMMENDATIONS

R1. In recognition of the substantial differences between recreational hunting of 'game' and effective control of invasive vertebrates, reject the inaccurate label of 'conservation' for recreational hunting licences or bodies.

R2. Reject the proposal for a publicly funded or government-endorsed platform that enables hunting organisations to perpetuate false claims about invasive vertebrate management.

R3. Promote the principles for effective management of invasive animals, codes of practice and standard operating procedures, and commit to funding only programs that meet these standards.

3. CONSERVATION RISKS: A bill to undermine control of invasive animals

The most troubling features of the Hunting Bill are the enhanced opportunities it provides for the hunting lobby to undermine invasive animal control, particularly on public land. Through a hunter-dominated Hunting Authority, a right to hunt, publicly funded propaganda, increased access to public lands and obligations of public land managers, the Hunting Bill is intended to provide hunters with the means to shape the management of public lands and invasive vertebrates.

In this section, we describe the levers of influence provided by the Hunting Bill and the potential consequences of these for influencing the management of invasive vertebrates and public lands in NSW.

3.1 What levers does the Hunting Bill provide for increasing hunter influence over public land management?

3.1.1 Elevated status and prominence for a minor recreational sector

The Hunters Bill would grant great prominence and influence to the recreational pursuit favoured by a mere 25,821 people (97% male) – the average number of licenced hunters in 2024 [30]. Hunting is not a popular recreational activity – practiced by only 0.3% of the population (those with a restricted licence, which allows hunting on public land) – yet would be granted greater rights and prominence than other more popular recreations such as birdwatching, bushwalking, climbing, camping, bush regeneration or lawn bowls?

The main levers of influence for hunters proposed under the Hunting Bill include the following:

Elevating the status of hunting: The establishment of a 'Conservation Hunting Authority' would provide the hunting lobby with considerable status – greater than that afforded to the current Game and Pest Management Advisory Board – and an aura of expertise on conservation and invasive vertebrate control. Hunting groups will have control over the proposed hunting authority, with a 4-3 voting majority (unlike the current advisory board). The label of 'conservation' endows hunting with a loftier purpose than recreation.

Empowering hunter lobbying: The Hunting Bill would institutionalise recreational hunter advocacy at a high level by providing a formal channel for hunter-centric advice to reach the executive level of government, and public sector managers of land and invasive vertebrates,whether or not that advice is requested. The appointment of a Minister for Hunting, presumed under the Hunting Bill, would elevate the political profile and influence of one minor recreational sector over all others.

Creating a right to hunt: The co-option of the concept of cultural rights, by creating a statutory 'right to hunt' for recreational hunters, will send a potent message to public land managers and the public. It would mainly be implemented via statutory obligations on public land managers to consider the right to hunt in land management decisions. This would elevate the interests of a small group of public land users above other users. No other recreationists have been granted a formal right (absolute or not) to undertake their preferred activity on public land.

3.1.2 Creation of a propaganda platform for hunting

As part of a push to elevate recreational hunting as much more than a recreational activity, the Hunting Bill requires the promotion of recreational hunting both as a form of conservation and as a cultural practice (one in apparent need of preservation).

The main levers for these propaganda functions are the following:

Promoting hunting as conservation: As well as appending 'conservation' to the name of the Hunting Authority and hunting licences, the Hunting Bill specifies that the Hunting Authority will 'promote research into the benefits of hunting for conservation' and 'promote the objects of the Bill, which include recognising hunting as a way to encourage conservation' (section 9(1)). The Hunting Authority may receive public funding for the first function – from the Game and Pest Management Trust Fund (thus expanding the purposes of this fund).

Promoting hunting as a cultural practice: As well as establishing a right to hunt for cultural reasons, the Hunting Bill specifies that the Hunting Authority will 'promote research the benefits of hunting for … the preservation of cultural practices' and 'promote the objects of the Bill, which include recognising hunting as a way to … preserve the cultures of different groups' (section 9(1)). The Hunting Authority may receive public funding for the first function from the Game and Pest Management Trust Fund.

3.1.3 Pressure on public land managers to facilitate and favour hunting

The current Game and Feral Animal Control Act 2002 (section 20) says the responsible Minister for public land may make a declaration that game animals on that land may be hunted by duly licenced persons. The Hunting Bill replaces this one ministerial option with obligations imposed on public sector land managers to proactively consider facilitating hunting and to consider the effects of land management decisions on hunting. One fortunate exemption to these provisions is the national park estate (4B(3), 9A.3(3)).

The main levers of influence over public land managers are the following:

Obliging public land managers to consider hunting: As well as prescribing a 'right to hunt', the Hunting Bill obliges most public sector land managers when making a land management decision to consider both (section 4B):

- the existing rights of individuals to hunt on the land
- whether or not it is practicable to facilitate hunting on the land.

This new obligation would result in increased pressure on land managers to allow hunting. Although the right is not absolute (section 4A(2)), the specified constraint to the right – 'decisions reasonably made under this Act or another law' – may leave open the potential for hunters to challenge and lobby against decisions perceived as not 'reasonably made'.

The Hunting Bill would increase the pressure on state forest managers to allow hunting by amending the objects of the Forestry Act to include 'promoting the use of the forestry area for hunting' (section 4.1[1]). The Forestry Act already contains an object 'to promote the recreational use of the forestry area' (section 59(1)(b)). This proposed object specific to hunting suggests that hunting should be prioritised over other recreational uses, none of which are specifically mentioned in the objects.

Creating a presumption of access to Crown lands: Unlike general provisions for 'public land' in the current Game and Feral Animal Control Act that rely on ad-hoc declarations, the Hunting Bill mandates the creation of a structured process for designation of lands for hunting within the Crown Land Management Act itself. The Hunting Bill would amend the Crown Land Management Act to create a presumption for hunting on certain types of crown lands of 400 hectares or more or adjoining already declared land, depending on whether there are prescribed uses of the land (section 9A.3). The Hunting Bill would immediately designate 23 parcels of crown land for hunting (listed in schedule 5A).

Facilitating a hunter-centric approach to public land management: The Hunting Bill provides several new avenues for hunters to influence land management to favour hunting, signifying a potential shift to a hunter-centric approach to managing public lands. The land management decisions subject to hunter influence would include those affecting the availability of 'game' animals – such as whether to implement control programs for invasive animals using baiting, aerial shooting or professional shooters, all of which are likely to be opposed by the hunter-dominated Hunting Authority. The Hunting Bill provides influence to recreational hunters far beyond that of any other users of public lands.

The Hunting Bill requires public sector land managers to consider the right to hunt when they make land management decisions (as noted above, section 4B). As well as bureaucratic burdens to satisfy these obligations, public land managers are likely to be subject to pressure to 'outsource' invasive vertebrate control to hunters.

This pressure would be compounded by one of the specified functions of the Hunting Authority being 'to liaise with public sector agencies on land management matters' (section 9(1)(c)) – a statutorily sanctioned lobbying opportunity for the Hunting Authority to pressure land managers to prioritise the interests of hunters.

The Hunting Bill requires forest managers to consult with the Hunting Authority when a management plan for a state forest or a working plan for a flora reserve is reviewed (schedule 4.1[2]) – a right to direct consultation accorded to no other sector or forest user group (not even Traditional Owners).

The Hunting Bill also provides the Hunting Authority with authority to give advice to (lobby) the so-called Minister for Hunting, Local Land Services, and 'other bodies the Authority considers relevant' on matters relevant to invasive animal management (section 9(1)(d-e)).

3.2 Should hunters be granted influence over the management of public lands and invasive vertebrates?

Other users of forestry and Crown lands in New South Wales will have reason to be angry at the inequitable prioritisation of hunter interests granted by the Hunting Bill.

But anyone who cares about the state of the NSW environment will have reason for anger and great concern about the multiple ways granted by the Hunting Bill for recreational hunters to adversely influence the management of public lands (other than most protected areas) and invasive vertebrates. The rights and influence granted to hunters are likely to be detrimental to conservation in the following ways.

Impediments to effective control of invasive vertebrates: Some recreational hunters and their representatives, including the Shooters Party, oppose the use of effective methods for controlling invasive species, particularly lethal baiting and aerial shooting (Box 2). The Hunting Bill will provide statutorily sanctioned opportunities for them to lobby public land managers, Local Land Services, and government ministers and executives to reject the use of effective control methods and professional operators – to avoid impacting on a right to hunt or reducing the availability of 'game'.

Land managers may be tempted to avoid the expense or management burden of effective control programs by the potential to use the apparently 'free' service of hunters, regardless of its ineffectiveness. Hunting can be used as an excuse to avoid responsibilities for invasive animal control.

Propagating fallacies about invasive vertebrate control: The Hunting Bill will lead to government-backed propagation of misleading information about recreational hunting as a viable method of invasive animal control. This will encourage public (and private) land managers to leave control to hunters. Passage of the Hunting Bill would inevitably put pressure on other state and territory governments to adopt similar, flawed approaches.

Transforming public lands into game reserves: State forests are already inadequately managed for invasive animal threats, with a lack of strategies, plans and reporting and managers often reluctant to use effective control methods (section 2.2). The existing deficiencies will be compounded by an increased influence of hunters over forest management provided for under the Hunting Bill – leading to growing invasive threats. There is a high risk of transforming public lands into de facto game reserves, where invasive animals are tolerated or encouraged to maintain hunting opportunities.

Risking the spread of invasive vertebrates: As the areas of public land available to hunters increases, so does the risk of a few maverick hunters shifting invasive animals to create new hunting grounds to supplement existing populations. Many feral deer populations in NSW are known to have been illegally established by hunters. A 2004 analysis found that more than half the feral deer herds in Australia appeared to have arisen from illegal translocations [37]. Genetic testing of feral pig populations in south-western Australia found that about 1 in 20 of the sampled pigs had been illegally shifted from populations 50 to >400 km distant [38].

Diverting scarce public funding from effective control programs: Regulation of hunting over larger areas of public land will require significant public funding, as will supporting the proposed functions of the Hunting Authority. This will divert resources that could otherwise be allocated to effective invasive animal control programs. The costs of hunting and diversion of public funds will further escalate when the NSW Government offers bounties for foxes, cats and pigs.

Important questions to inform decision-makers about the potential consequences of providing hunters with influence over the management of public lands

1. Should one recreational sector, with participation by 0.3% of the NSW population, be granted rights greater than any other recreational sector to influence the use and management of public lands? Have other public land users been consulted about this?
2. What are the 23 parcels of Crown land listed in schedule 5A, including their location, area, current uses, conservation values and invasive threats?
3. Does the NSW Government support the promotion of 'the benefits of hunting for conservation' (a proposed function of the hunting authority) when this contradicts the

advice of their own experts, codes of practices and standard operating procedures? Would there be any requirement for this promotion to be fact-checked by government experts?

4. Given it is in the interests of recreational hunters to have more rather than fewer invasive animals available for hunting, what are the risks of granting recreational hunters the right to influence public land management?
5. Has the NSW Government consulted with the managers of public land about whether they consider it beneficial to be advised and lobbied by recreational hunters about land management, and what were the results of that consultation?

Important questions to inform decision-makers about the funding implications of the Hunting Bill

1. Regarding the Game and Pest Management Trust Fund:
    a. How much money is currently held in the fund?
    b. How much income has been generated by hunting licence fees for each of the past 5 years?
    c. What have been the levels and sources of other income for each of the past 5 years?
    d. What have been the expenditure and categories of expenditure for each of the past 5 years?
    e. Who is responsible for managing and auditing the fund and what are the reporting requirements?
2. What are the estimated costs for establishing and maintaining the proposed conservation hunting authority and supporting its proposed functions? Where will this funding come from?
3. What are the current annual government costs – including regulation, management, compliance and enforcement – for enabling recreational hunting in state forests?
4. What are the estimated costs for expanding hunting access to the 23 parcels of Crown land listed in schedule 5A, including compliance and enforcement costs?

RECOMMENDATIONS

R4. Reject any provisions that elevate the interests of recreational hunters over other users of public land. The NSW Government should not grant preferential rights or influence to a single, minority interest.

R5. Remove any provisions that provide preferential rights or avenues for recreational hunters to influence public land management.

R6. Reject the concept of a 'right to hunt'. This grants unwarranted influence to a minor recreational sector over the management of public lands and places an unnecessary burden on public land managers.

R7. Ensure all decisions regarding invasive animal management on public lands are based on scientific evidence and expert advice from qualified conservation professionals, not recreational hunting lobbies.

4. GOVERNANCE RISKS: A bill with reputational and legal pitfalls

The Hunting Bill, premised on fallacies about the potential for recreational hunters to contribute to conservation simply by killing some invasive vertebrates, is the opposite of evidence-based policy-making. Here, we consider the potential for reputational damage and potential adverse legal consequences if the NSW Government supports the Hunting Bill.

4.1 Will the Hunting Bill foster consistency with laws, policies and standards?

Conflicting with government policy and undermining the credibility of government experts: The premises for the Hunting Bill directly conflict with numerous government documents and experts about what is required for effective management of invasive species. Government support for the bill undermines numerous genuine experts on invasive vertebrate control in DPI, NPWS and Local Land Services. There is no way to reconcile the NSW Government's support for the Hunting Bill and the notion of hunting as conservation with their own standards for invasive vertebrate control.

Engendering potential breaches of the general biosecurity duty: The Hunting Bill provides several ways for recreational hunters to influence public land management – by according the Hunting Authority expert status on invasive animal control, by labelling hunting a conservation activity and paying for it to be promoted as such, by requiring some public land managers to consult with the Hunting Authority over land management decisions and by facilitating the Hunting Authority to advise whomever they please in government on invasive vertebrate control, including experts such as Local Land Services. Because effective control means fewer invasive animals for hunting, some hunters, including the Shooters Party, oppose effective control methods such as lethal baiting and aerial shooting. If land managers accept the advice of the Hunting Authority that hunters are effective for invasive vertebrate control and other methods are not required, they run the risk of breaching their general biosecurity duty, which requires (section 22 of the Biosecurity Act):

> Any person who deals with biosecurity matter or a carrier and who knows, or ought reasonably to know, the biosecurity risk posed or likely to be posed by the biosecurity matter, carrier or dealing has a biosecurity duty to ensure that, so far as is reasonably practicable, the biosecurity risk is prevented, eliminated or minimised.

The reluctance to employ effective control methods seems evident in the management of NSW state forests (section 2.2). The Natural Resources Commission has previously raised concerns that the level of control in state forests may be insufficient to meet the Forestry Corporation's general biosecurity duty [33].

Engendering inequities and social conflict: Other users of public lands will understandably be angered by the elevation of hunters over all other users of public land – including by the notion of a right to hunt, the requirement for public land managers to consider the rights of hunters and facilitate access, and by the granted rights for hunters to influence public land management. Also guaranteed

to anger many people is the label of 'conservation hunting', which is offensive to both genuine conservationists and those who conduct effective invasive vertebrate control.

4.2 Does the Hunting Bill satisfy government standards for evidence-based policy-making?

Violating NSW's Better Regulation principles: The NSW Government requires new and amending regulatory proposals to demonstrate compliance with its 'better regulation' principles [39]. The Hunting Bill breaches most of these principles. It meets the criteria for being a 'significant regulatory proposal' because it introduces a major new regulatory initiative; will have a significant impact on individuals, the community, or a sector of the community; and imposes significant costs. We focus here just on the first 2 principles.

Principle 1: The need for government action should be established. Government action should only occur where it is in the public interest, that is, where the benefits outweigh the costs.

Response: There has been no credible attempt to establish a need for the Hunting Bill or demonstrate that the Bill is in the public interest. The main rationales for the Bill are not consistent with principle 1:

> Second reading speech: [The bill] recognises the vital role of licensed conservation hunters in managing invasive species, protecting cultural traditions and strengthening regional economies. …the bill ensures hunting remains a regulated, ethical and effective tool for conservation … It affirms the right of all citizens—Indigenous and non-Indigenous—to hunt for cultural, recreational and environmental purposes …

- The Bill cannot solve the identified problem: The problem ostensibly being addressed by the Hunting Bill – conservation damage caused by invasive animals – cannot be solved by the proposed measures. Hunters *do not* play a vital role in managing invasive species; hunting *is not* an effective conservation tool – as NSW Government documents and experts make clear (see section 2).
- Lack of demonstrated need: The Bill *is not needed* to protect hunting as a tradition. Although practised by only a small proportion of the NSW population, it is not in danger of dying out. Nor is the Bill needed or likely to strengthen regional economies, for hunters already have access to a large area of public lands, exceeding a million hectares, as well as many private properties. No information has been provided to suggest that hunters have saturated the available lands.
- Not in the public interest: The Bill is opposed to the public interest for the many reasons outlined in section 3 and below, including that it is likely to undermine effective invasive animal control on public lands.

Principle 2: The objective of government action should be clear [clear, concise and specific; directly targeting the root cause of the problem; measurable; consistent with existing government objectives or policies]

Response: Given that the main ostensible objective of this legislation is conservation, the evidence in government documents contradicting the claimed value of recreational hunting for invasive

vertebrates control shows that the real objective of the legislation is not clear, not measurable, not targeting the root cause of a problem and not consistent with government objectives and policies.

Important questions to inform decision-makers about the governance and reputational risks of the Hunting Bill

1. How will the NSW Government ensure that the proposed conservation hunting authority does not publish documents and provide advice to public land managers that conflicts with the advice of government experts on invasive vertebrates control?
2. Does the current management of invasive vertebrates in state forests consistently comply with the general biosecurity duty, including in areas open to recreational hunting? What is the evidence of compliance?
3. Does the Hunting Bill comply with the NSW Government's 'better regulation' principles, including principle 1 that the need for government action should be established and regulation should only occur where it is in the public interest?

RECOMMENDATIONS

R8. Make explicit the obligations of public land managers for invasive vertebrates control – to satisfy the general biosecurity duty and to enable the NSW Government to meet conservation goals and targets. The obligations should include requirements for mapping and reporting on invasive animal presence and density, developing an invasive animal management strategy and outcome-focused control plans, implementing control using the most effective and humane methods and monitoring and publicly reporting on the outcomes of control.

R9. Reject the Hunting Bill in entirety – and instead strengthen existing professional control programs that:

A. have demonstrated effectiveness
B. operate within best practice governance frameworks
C. serve the public interest in environmental protection and public land management.

5. IMPORTANT QUESTIONS the Parliamentary Committee should ask

The following is a compilation of the questions in previous sections with some additional ones.

Questions about recreational hunting and invasive vertebrate control in NSW

1. Is recreational hunting consistent with the NSW Government's codes of practice and standard operating procedures for pest control?
2. Has the NSW Government undertaken any analysis of the effectiveness of recreational hunting for invasive vertebrate control, mindful of the distinction between recreational hunting and volunteer shooters participating in coordinated control programs?
3. Have NSW government experts on invasive vertebrate control been asked to provide any advice on the Hunting Bill or the proposed bounties regarding:
    a. the effectiveness of recreational hunting for invasive animal control for conservation outcomes?
    b. whether promoting recreational hunting as a 'conservation' activity is consistent with the NSW codes of practice and standard operating procedures?
4. Does the NSW Government support the promotion of 'the benefits of hunting for conservation' (a proposed function of the hunting authority) when this contradicts the advice of their own experts, codes of practices and standard operating procedures? Would there be any requirement for this promotion to be fact-checked by government experts?
5. What are the rules and principles that guide the use of 'highly skilled' volunteer shooters in the NSW Government's supplementary pest control program in national parks? What level of competence is required for participation in the program? How effective has the program been at achieving conservation outcomes?
6. What area (hectares) and percentage of the state forest estate are currently declared and open to licensed hunting?
7. How many invasive animals, broken down by species, were harvested in state forests by recreational hunters in 2024–25?
8. How many hunting days were reported for 2024–25?
9. For each of the state forests available for recreational hunting:
    a. What area (hectares) is available for hunting?
    b. What is the most up-to-date estimate of invasive animal numbers, broken down by species?
    c. How many invasive animals, broken down by species, were harvested in each of these forests in 2020–21, 2021–22, 2022–23, 2023–24 and 2024–25?
    d. How many reported hunting days were there in each of these forests in each of 2020–21, 2021–22, 2022–23, 2023–24 and 2024–25?
10. What is the minimum to maximum number of hectares allocated to each hunter or hunting group for licenced hunting?
11. Does the NSW Forestry Corporation consider recreational hunting to be an effective method for controlling invasive animals and, if so, what is the evidence informing this view?
12. How much has it cost the NSW Government over the past 5 years to (a) administer recreational hunting and (b) undertake enforcement for recreational hunting in NSW state

forests?

13. How effective do NSW Government experts on invasive vertebrate control rate ground shooting as a control method for each invasive vertebrate species targeted by hunters?
14. What are the implications of including camels in the list of game animals (Schedule 3)?
15. Hypothetical scenario - both under current circumstance and if the Hunting Bill is passed:

    Imagine Local Land Services want to conduct an aerial shooting operation to regionally eradicate an emerging population of feral deer and wanted to include a state forest designated for hunting in the area for the aerial shoot:

    a. Who would make the decision about whether or not to allow the aerial shooting operation to go ahead on the state forest land?
    b. What factors would be considered in this decision?
    c. What consultation would occur?
    d. What would the implications be if the Conservation Hunting Authority deemed that the aerial shooting would have an unacceptable impact on hunter amenity and should not go ahead?
    e. What would happen if Forestry Corp or the DPI decided that the aerial shooting operation could not go ahead, either on their own or on the basis of advice from the Conservation Hunting Authority?

Questions about invasive vertebrate control in state forests

16. What surveys of invasive animal populations, if any, have been conducted in state forests during the past 5 years, and what were the results?
17. What is the damage in state forests being caused by each invasive animal species targeted by hunters?
18. What invasive animal control operations has Forestry Corporation undertaken or commissioned in native state forests for conservation reasons over the past 5 years? For each operation:
    a. When and where did it occur and what species were targeted?
    b. What were the objectives and intended outcomes?
    c. What methods were used?
    d. What were the monitored outcomes and results?
    e. How much did the operation cost?
19. What monitoring of invasive animal populations and what control operations, if any, have occurred in state forest areas open to hunting, and what were the (a) intended outcomes and objectives and (b) monitored outcomes and results of each operation?
20. What was the expenditure for each of 2020–21, 2021–22, 2022–23, 2023–24 and 2024–25 by Forestry Corporation of NSW, broken down by administrative region, for each of:
    a. fox and dingo/dog control?
    b. deer control?
    c. pig control?
    d. goat control?
    e. other vertebrate pest control?
21. How many aerial shooting operations occurred on state forest lands in each of 2020-21, 2021-22, 2022-23, 2023-24 and 2024-25, broken down by administrative region?
22. In which state forests has aerial shooting occurred in the past 2 years?

23. How many requests were made to either Forestry Corporation or Forests NSW to participate in regional aerial shooting operations in each of 2020–21, 2021–22, 2022–23, 2023–24 and 2024–25, broken down by state forest?
24. How many requests to either Forestry Corporation or Forests NSW to participate in regional aerial shooting operations were approved, in each of 2020–21, 2021–22, 2022--23, 2023-24 and to date in 2024–25, broken down by state forest?
25. How many requests to either Forestry Corporation or Forests NSW to participate in regional aerial shooting operations were rejected, in each of 2020-21, 2021-22, 2022-23, 2023-24 and to date in 2024-25, broken down by state forest? Please include information as to who made each request and why each request was rejected.
26. What is the current process for approving aerial shooting operations in NSW State Forests?
27. What role does the DPI's Game Management Unit play in assessing applications to undertake pest control other than recreational shooting in state forests?
28. Have state forest managers been lobbied or advised by hunters, hunter groups or the DPI Game and Pest Management Management Unit to not undertake control operations, including by aerial shooting?
29. In control programs conducted on national parks, what are the main methods used and how many animals of each species targeted are removed by each method? How are the methods of control selected for each program? In what circumstances is ground shooting regarded as effective?
30. What are the minimum standards required of ground shooters employed as staff or contractors by the NSW Government?

Questions regarding public land management

31. Should one recreational sector, with participation by 0.3% of the NSW population, be granted rights greater than any other recreational sector to influence the use and management of public lands? Have other public land users been consulted about this?
32. What are each of the 23 parcels of Crown land listed in schedule 5A? Where are they located, what is their purpose, and what is their size (hectares)?
33. Given it is in the interests of recreational hunters to have more rather than fewer invasive animals available for hunting, what are the risks of granting recreational hunters the right to influence public land management?
34. Has the NSW Government consulted with the managers of public land about whether they consider it beneficial to be advised and lobbied by recreational hunters about land management, and what were the results of that consultation?
35. What legal advice has the Government received about how the new right to hunt may impact on and conflict with other rights or amenities on public lands?
36. What will be required for a public land manager to discharge the obligations under 4B (1)? What consequences will potentially follow from a failure to properly discharge these obligations?
37. How much total land in hectares is currently covered as Land on which hunting is permitted—criteria compliant land under the new Part 9A of the Crown Lands Act?
38. How much land in hectares that is currently managed by local governments is covered as Land on which hunting is permitted—criteria compliant land under the new Part 9A of the Crown Lands Act?
39. How much land in hectares that is currently designated for environmental, environmental protection or nature conservation is covered as Land on which hunting is

permitted—criteria compliant land under the new Part 9A of the Crown Lands Act?

Questions regarding costs

40. Regarding the Game and Pest Management Trust Fund:
    a. How much money is currently held in the fund?
    b. How much income has been generated by hunting licence fees for each of the past 5 years?
    c. What have been the levels and sources of other income for each of the past 5 years?
    d. What have been the expenditure and categories of expenditure for each of the past 5 years?
    e. Who is responsible for managing and auditing the fund and what are the reporting requirements?
41. What are the estimated costs for establishing and maintaining the proposed conservation hunting authority and supporting its proposed functions? Where will this funding come from?
42. What are the current annual government costs – including regulation, management, compliance and enforcement – for enabling recreational hunting in state forests?
43. What are the estimated costs for expanding hunting access to the 23 parcels of Crown land listed in schedule 5A, including compliance and enforcement costs?

Other questions

44. What is the reason for the composition of the Conservation Hunting Authority, with hunting representatives outnumbering other representatives 4-3?
45. What does representing the interests of licensed game hunters entail under 9(1)(a)?
46. Why does the Environment Minister not have any representative on an authority intended to be about conservation?
47. Under section 9A.4, could the Minister at any time and without parliamentary oversight expand the categories of crown land on which hunting is permitted to include water catchments, road or rail corridors?

6. REFERENCES

1. NSW National Parks and Wildlife Service. Conservation: Supplementary pest control. In: NSW Government [Internet]. 2025. Available: https://www.nationalparks.nsw.gov.au/conservation-programs/supplementary-pest-control-program

2. Brandle R, Mooney T, de Preu N. Broad-scale feral predator and herbivore control for yellow-footed rock-wallabies: improved resilience for plants and animals= Bounceback. Recovering Australian threatened species: A book of hope; Garnett, S, Woinarski, J, Lindenmayer, D, Latch, P, Eds. 2018; 135–145.

3. SSAA. Position Statement. In: Sporting Shooters' Association of Australia [Internet]. Available: https://www.ssaa.org.au/resources/position-statement/

4. Sharp T, Cope H, Saunders G. New South Wales Code of Practice and Standard Operating Procedures for the Effective and Humane Management of Feral Cats. NSW Government Department of Primary Industries; 2022.

5. Sharp T, Cope H, Saunders G. New South Wales Code of Practice and Standard Operating Procedures for the Effective and Humane Management of Feral Deer. NSW Government Department of Primary Industries; 2022.

6. Sharp T, Cope H, Saunders G. New South Wales Code of Practice and Standard Operating Procedures for the Effective and Humane Management of Feral Pigs. NSW Government Department of Primary Industries; 2022.

7. Sharp T, Cope H, Saunders G. New South Wales Code of Practice and Standard Operating Procedures for the Effective and Humane Management of Feral Goats. NSW Government Department of Primary Industries; 2022.

8. Sharp T, Cope H, Saunders G. New South Wales Code of Practice and Standard Operating Procedures for the Effective and Humane Management of Rabbits. NSW Government Department of Primary Industries; 2022.

9. Bengsen AJ, Forsyth DM, Harris S, Latham ADM, McLeod SR, Pople A. A systematic review of ground-based shooting to control overabundant mammal populations. Wildlife Research. 2020;47: 197–207.

10. Sharp T, Cope H, Saunders G. New South Wales Code of Practice and Standard Operating Procedures for the Effective and Humane Management of Foxes. NSW Government Department of Primary Industries; 2022.

11. Game Management Authority. Ethical hunting. In: Victoria State Government [Internet]. 9 Dec 2019. Available: https://www.gma.vic.gov.au/hunting/deer/ethical-hunting

12. Hall G. Does recreational hunting have a role in conservation? School of Environmental and Rural Science, University of New England; 2012. Available: https://ssaa.org.au/assets/news-resources/hunting/does-recreational-hunting-have-a-role-in-conservation.pdf

13. Editorial. Wild Boar Australia. July 2004: 4.

14. Von Essen E. How wild boar hunting is becoming a battleground. Leisure Sciences. 2020;42: 552–569.

15. Bourman J. Tabled petition 8856 - Stop the aerial culling of deer. In: Parliament of Victoria [Internet]. 2024. Available: https://www.parliament.vic.gov.au/parliamentary-activity/tabled-petitions-search/tabled-petitions-details/8856

16. Braysher M, Buckmaster T, Saunders G, Krebs CJ. Principles underpinning best practice management of the damage due to pests in Australia. Proceedings of the vertebrate pest conference. 2012. Available: https://escholarship.org/uc/item/4df055d0

17. Braysher M. Managing Australia's Pest Animals: A Guide to Strategic Planning and Effective Management. CSIRO Publishing; 2017.

18. Hone J. Wildlife damage control. CSIRO publishing; 2007.

19. NSW Department of Primary Industries. NSW Codes of Practice and Standard Operating Procedures. In: NSW Government [Internet]. 2022. Available: https://www.dpi.nsw.gov.au/biosecurity/vertebrate-pests/publications/standard-operating-procedures

20. Hone J, Duncan RP, Forsyth DM. Estimates of maximum annual population growth rates (rm) of mammals and their application in wildlife management. Journal of Applied Ecology. 2010;47: 507–514.

21. Hone J. On rate of increase (r): patterns of variation in Australian mammals and the implications for wildlife management. Journal of Applied Ecology. 1999;36: 709–718.

22. National Parks and Wildlife Service. Feral animal management strategy. NSW Government Department of Climate Change, Energy, the Environment and Water; 2025. Available: https://www.environment.nsw.gov.au/sites/default/files/2025-07/feral-animal-management-strategy-250239.pdf

23. Norbury G, Wilson DJ, Clarke D, Hayman E, Smith J, Howard S. Density-impact functions for invasive house mouse (Mus musculus) effects on indigenous lizards and invertebrates. Biol Invasions. 2023;25: 801–815.

24. Mutze G, Cooke B, Jennings S. Estimating density-dependent impacts of European rabbits on Australian tree and shrub populations. Australian Journal of Botany. 2016;64: 142–152.

25. Norbury GL, Pech RP, Byrom AE, Innes J. Density-impact functions for terrestrial vertebrate pests and indigenous biota: guidelines for conservation managers. Biological Conservation. 2015;191: 409–420.

26. Banks PB. Predation by introduced foxes on native bush rats in Australia: do foxes take the doomed surplus? Journal of Applied Ecology. 1999;36: 1063–1071.

27. Clout MN, Williams PA. Invasive Species Management: A Handbook of Principles and Techniques. Oxford University Press; 2009.

28. Thompson BK, Olden JD, Converse SJ. Mechanistic invasive species management models and their application in conservation. Conservation Science and Practice. 2021;3: e533.

29. Comte S, Bengsen AJ, Botterill-James T, Brausch C, Bryant SL, Dickson CR, et al. Impacts of Recreational Hunting on an Introduced Population of Fallow Deer (*Dama dama*) in Tasmania, Australia. Eco Management Restoration. 2025;26: e70001.

30. Department of Primary Industries. Hunting. In: NSW Government [Internet]. 2024. Available: https://www.dpi.nsw.gov.au/about-us/publications/pdi/2024/hunting

31. Booth C. 1080: A weighty ethical dilemma. Invasive Species Council; 2020. Available: https://invasives.org.au/wp-content/uploads/2020/11/1080-Weighty-Ethical-Issue.pdf

32. Forestry Corporation. Sustainability Report 2023-24. State of New South Wales; 2024. Available: https://app.powerbi.com/view?r=eyJrIjoiOGZhNWZiMmQtZWY4Ny00YTBhLWJlYTYtYzQ0NDdjY2RmMjIyIiwidCI6IjdlODcyMjA5LWY3MGItNDU3OC1hNzk5LTA4YTdjZjAzODI3NSJ9

33. Natural Resources Commission. Shared problems, shared solutions. State-wide review of pest animal management. NSW Government; 2016. Available: https://www.nrc.nsw.gov.au/Pest%20animal%20review%20-%20Final%20report.pdf

34. Forestry Corporation. NSW State Forests. NSW Government; 2014. Available: https://www.forestrycorporation.com.au/__data/assets/pdf_file/0004/436189/List-of-State-Forests.pdf

35. NSW Department of Primary Industries. NSW Invasive Species Plan 2023-2028. 2023 Jan.

36. Natural Resources Commission. Reducing Risk, Securing the Future. NSW Government; 2024. Available: https://www.nrc.nsw.gov.au/Final%20report%20-%20NSW%20invasive%20species%20management%20review%20-%20November%202024.PDF

37. Moriarty A. The liberation, distribution, abundance and management of wild deer in Australia. Wildlife Research. 2004;31: 291–299.

38. Spencer PBS, Hampton JO. Illegal translocation and genetic structure of feral pigs in Western Australia. Journal of Wildlife Management. 2005;69: 377–384.

39. Treasury. NSW Government guide to better regulation. NSW Government; 2019. Available: https://www.productivity.nsw.gov.au/sites/default/files/2022-05/TPP19-01_Guide-to-Better-Regulation.pdf