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The Executive Officer
Environment, Natural Resources and Regional Development Committee
Parliament House
Spring Street
East Melbourne Vic 3002
enrrdc@parliament.vic.gov.au

**Inquiry into the control of invasive animals on crown land
Submission from the Australian Deer Association Inc.**

EXECUTIVE SUMMARY

The Australian Deer Association (ADA) is Australia's leading organisation representing the interests of deer hunters, managers and enthusiasts.

ADA members are engaged in deer control, management and monitoring activities with Government agencies in Victoria, Tasmania, South Australia, Western Australia and the Northern Territory, and with private landholders and Non-Government Organisations in all Australian states except the ACT.

In ADA's considerable experience with deer and deer management it has observed that effective management of wild deer in Victoria is inhibited by a lack of co-ordination, access, strategy, knowledge of how to best employ the human resource and physical resources such as specialised equipment. Fix these issues and the management of deer will significantly improve.

A position propagated by anti-hunting and anti-deer organisations and people is that wild deer are afforded protection from control by virtue of 'game' status is erroneous. Wild deer (other than hog deer) are unprotected on private land in Victoria and the other five species have a 365 day-a-year season and no bag limit. It is quite clear that 'game' classification is not an impediment to effective deer management in Victoria.

Reclassification of deer as a 'pest' species would create additional financial burdens on government and private land managers in terms of compliance for management of deer. As was seen by the nomination of sambar as a *Key Threatening Process (2007)*, if reclassification of deer to a declared pest species is not supported by a comprehensive management plan and resources to execute it, the status quo will remain and there will be no change to deer management in Victoria.

ASSESSMENT OF THE BIODIVERSITY OUTCOMES, COMMUNITY SAFETY AND LIMITATIONS OF THE TRIAL CONDUCTED BY PARKS VICTORIA ON CONTROL OF DEER POPULATIONS IN A NATIONAL PARK

We believe that all control programs should be underpinned by solid data to quantify the problem, a clear understanding of what needs to be achieved, appropriate resourcing to ensure that targets can be met, and continuous monitoring and review to ensure that programs are meeting expectations.

ADA's experience (outlined in the case studies below) is that the programs which enable the highest level of flexibility for volunteer hunters (whilst maintaining necessary controls) are the most effective.

The current game regulations provide adequate controls and additional oversight in many cases is unwarranted (e.g. in remote hunting areas) however in some cases

oversight and tight management is critical to ensuring program effectiveness and public safety.

Recreational hunting in Victoria has an exceptional safety record as is evidenced by data provided from the National Coroners Information System (NCIS).

CONSIDERATION OF THE APPLICATION OF THESE TYPES OF PROGRAMS FOR OTHER INVASIVE ANIMAL SPECIES IN PARTNERSHIP WITH CROWN LAND MANAGERS

Any abundant or overabundant vertebrate should be considered for sustainable control programs to protect biodiversity regardless of the legal status or indeed of perceived community attitudes towards the particular species of wildlife.

Conservation wildlife management initiatives should aim to address impacts and if those impacts are spread evenly between introduced animals such as deer and native animals such as kangaroos then treatment activities must be afforded to each species in equally.

ASSESSMENT OF THE RELATIVE COSTS AND BENEFITS, FINANCIAL OR OTHERWISE, OF OTHER FORMS OF PEST CONTROL IN NATIONAL PARKS

ADA has a longstanding position that public land should be open for recreational hunting in the absence of a good reason for exclusion.

There is no clear data to prove or disprove the contention that recreational hunting has a positive impact on biodiversity. There is an apparent correlation between the limitation of access for recreational deer hunters and the local overabundance of deer.

The administration of managed control programs comes at a cost to government and to the volunteer organisations involved. These costs could be significantly reduced if deer were controlled by opening areas to normal recreational hunting where there is no good reason not to do so and directing hunters to target deer in areas of overabundance.

Paid wildlife control measures can be very effective at protecting environmental assets however large scale control measures using contract shooters can be relatively expensive.

RECOMMENDATIONS

- There should be an assessment of public land in Victoria from which deer hunting is excluded, with a view to opening all land where there is no good reason to prohibit hunting.
- A state-wide strategy should be developed, adopted and properly resourced to sustainably manage wild deer populations in Victoria. Actions should focus on preventing the establishment of new populations of deer and on protecting high value environmental assets.

- The Game Management Authority should be tasked and resourced as the lead agency for the development and implementation of a Victorian Deer Management strategy.
- Existing and future deer (and other wildlife) management programs involving public land managers and volunteer recreational hunters should be assessed against a series of objective criteria and resourced appropriately. An example of criteria might be:
 - Is the problem clearly quantified?
 - Is there a clear understanding of what is required to address the problem?
 - Is the treatment possible/feasible through simply opening the area in question to recreational hunting?
 - Is there robust monitoring of all species of wildlife creating the undesired impact?
 - Is there robust monitoring of the environmental asset which is being impacted?
 - Is there adequate resourcing to achieve the desired outcomes?
 - Is there monitoring of volunteer and community sentiment?
- The Game Management Authority should be tasked and resourced as the lead agency for the planning and oversight of deer (and other wildlife) programs.
- The use of sound moderators should be made legal for recreational rifle shooters in Victoria.
- Necessary changes to regulation should be made to allow the processing of wild shot food for human and pet consumption on commercial premises.

INTRODUCTION

Established in Melbourne in 1969, the Australian Deer Association has established branches in every state and territory of Australia and in several overseas countries.

Wild deer have been established in Victoria since the early 1860s¹. Of the six species of wild deer in Australia, four – sambar, red deer, fallow and hog deer – have established self-maintaining populations in Victoria². Sambar have distributed more or less naturally from their initial releases in Westernport and the Dandenong ranges, and now occupy forested areas throughout the east of the state. There is a long established red deer herd in the Grampians area and satellite herds (the result of illegal releases, which, in Victoria, commonly occur from failed deer farms) throughout the state. Likewise, fallow deer are present in pockets across the state, largely as a result of escape from deer farms or from illegal releases. Hog deer have a small population in the coastal strip in the east of the state extending from around Tooradin to Lakes Entrance.

Populations have increased notably in Victoria over the past twenty years or so. Sambar deer populations have dispersed and increased in the wake of a series of large alpine bushfires, commencing with the Caledonia fire in 1998. Sambar deer abundance is initially rapidly reduced by wildfire, as suitable habitat and food sources are depleted³. Within 16 months, sambar have typically re-occupied burnt areas and have taken advantage of the increased cover and food sources in the regrowth forest⁴. Red deer and fallow deer have also increased in numbers and distribution.

There is no definitive evidence either to support or to disprove the contention that normal recreational hunting plays a significant role in overabundant wildlife management⁵. However, the recreational deer harvest of 60,000 animals in 2015 must have an impact on the population, and should not be discounted simply because that impact is difficult to quantify.

Anecdotally, it is apparent that in areas where there is reasonable vehicular access and regular hunting pressure, issues typically associated with overabundant deer are reduced or absent. This is especially true in State Forest areas in Eastern Victoria where sambar are regularly hunted by crews using scent-trailing hounds.

In New Zealand, overabundant wildlife management programs have successfully operated, utilising a mix of recreational, commercial and aerial deer culling⁶. It should be noted that the terrain, dominant deer species and cultural attitude towards hunting are vastly different in New Zealand than they are in Australia.

¹ Bentley AR, 1998, *An Introduction to the deer of Australia*, Australian Deer Research Foundation Ltd, Melbourne

² Lindeman M and Forsyth D, 2008, *Agricultural impacts of wild deer in Victoria*, Arthur Rylah Institute for Environmental Research

³ Forsyth D, Gormley A, Woodford L and Fitzgerald T, October 2011, *Effects of the Black Saturday fires on Sambar Deer occupancy and abundance*, Department of Sustainability and Environment

⁴ Downes M, 1983, *Sambar in Victoria – The Forest Deer Project 1982*, Australian Deer Research Foundation Limited

⁵ Bengsen A and Sparkes J, February 2016, *Can recreational hunting contribute to pest mammal control on public land in Australia?*, Mammal Review (2016)

⁶ Husheer S and Robertson A, 2004, *High intensity deer culling increases growth of Mountain Beech seedlings in New Zealand*, CSIRO Wildlife Research Volume 32

An Australian review recently published by The Mammal Society contemplates the question "Can recreational hunting contribute to pest mammal control on public land in Australia?" It arrives at a conclusion that *"reliable information derived from scientific investigation of real-world situations is urgently needed to support the establishment of rational, agreed, and achievable management objectives. Until such information begins to become available, debate over the roles of recreational hunting as a means of pest management on public lands will continue to be dominated by untested hypotheses, selective half-truths and logical fallacies"*⁷. ADA supports and concurs with this conclusion.

ADA members are engaged in deer control, management and monitoring activities with Government agencies in Victoria, Tasmania, South Australia, Western Australia and the Northern Territory, and with private landholders and Non-Government Organisations in all Australian states except the ACT.

The effective management of wild deer in Victoria generally, is inhibited by a lack of co-ordination, access, strategy, knowledge of how to best employ the human resource, and physical resources such as specialised equipment. There are also a number of regulatory impediments to the effective management of wild deer in Victoria⁸.

It is important that effective management is viewed through the prism of addressing impacts rather than of numbers of animals taken. Reducing numbers is a means to achieving a more fundamental objective⁹. In some areas, a reduction of one or two deer may achieve significant biodiversity outcomes, whereas in other areas, it may be necessary to take a large number of deer to achieve the desired end.

The Victorian Generalised Invasion Curve is a useful tool for land managers considering appropriate responses to invasive animal populations¹⁰. An existing framework (The Invasive Plants and Animals Policy Framework) sets out the terms for a cohesive, whole of government response to invasive animals. In the foreword to that framework it states:

"The Victorian Government's approach will be to prevent the entry of new high risk IPA, eradicate those that are at an early stage of establishment and contain where possible species that are beyond eradication and take an asset-based approach to managing widespread invasive species. By working in partnership with relevant industry and communities, we can achieve this goal.

An important principle of this approach is that we will invest public money where it produces the most public benefit."

⁷ Bengsen A and Sparkes J, February 2016, *Can recreational hunting contribute to pest mammal control on public land in Australia?*, Mammal Review (2016)

⁸ Howlett B, 2016, *Effective management of overabundant wild deer, impediments from a policy, regulatory and stakeholder management perspective*, Proceedings from the Conservation through the sustainable use of wildlife conference 2016, University of Queensland

⁹ Decker D, Riley S and Siemer W, 2012, *Human dimensions of wildlife management*, JHU Press

¹⁰ Agriculture Victoria, July 2015, Invasive Plants and Animals Policy Framework, <<http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/protecting-victoria-from-pest-animals-and-weeds/invasive-plants-and-animals/invasive-plants-and-animals-policy-framework>>

GENERALISED INVASION CURVE SHOWING ACTIONS APPROPRIATE TO EACH STAGE

Version 1.0: 30 APR 2009

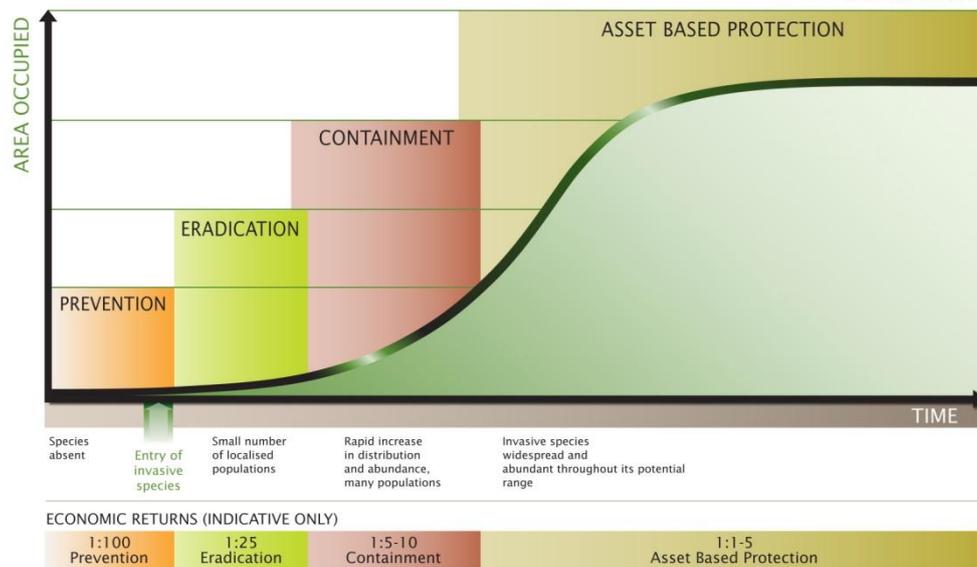


Figure 1 – Generalised Invasion Curve

Effective management should also include non-lethal options such as fencing and scent deterrents, as part of an integrated management strategy.

Effective management is not constrained by the legal status of deer. Wild deer in Victoria are managed as a game species under the auspices of the Wildlife (Game) Regulations 2012¹¹ – on public land where deer hunting is permitted, wild deer (other than hog deer) can be hunted up to 365 days a year with no bag limit¹².

A number of groups advocate for wild deer to be classified as pests instead of game animals. The typical rationale for this is that wild deer are somehow afforded protection from control by virtue of game status.

Wild deer (other than hog deer) are unprotected on private land in Victoria under a Governor in Council Order¹³. With the exception of some necessary animal welfare constraints, this order enables private land owners and managers to control wild deer populations on their property as they see fit. Public land managers also have mechanisms to allow them to control wild deer outside of the game regulations. Prohibitions on spotlighting on public land are maintained in the interests of public safety and would not conceivably be removed if deer were to be re-classified.

Whilst a number of groups have an ideologically-based preference for wild deer to be reclassified as a pest animal, there is no evidence from other jurisdictions to suggest that doing so would aid in management efforts. Pest declarations in South Australia and Queensland have apparently had no impact on the rate of increase of deer populations. Nearly a decade after the removal of game status for wild deer

¹¹ Wildlife (Game) Regulations 2012

¹² Game Management Authority Website, Deer, <<http://www.gma.vic.gov.au/hunting/deer>>

¹³ Game Management Authority, July 2014, Fact Sheet – Control of deer on private property, <http://www.gma.vic.gov.au/_data/assets/pdf_file/0020/316316/Private-property-June-2014-artwork.pdf>

in Queensland, the populations of the four well established wild deer species in that state (red deer, rusa, chital and fallow) are all significantly higher than when they were afforded game status¹⁴.

A shift to pest status would disenfranchise Victoria's hunting community and undermine the game licensing system and the successful RESPECT campaign¹⁵ that has been developed in partnership by Government agencies, recreational hunting organisations and industry.

A paper presented to the recent Conservation through the Sustainable Use of Wildlife Conference in Brisbane outlined the difficulties in collecting valuable data on hunter effort and success in all of the Australian jurisdictions where wild deer are not afforded game status¹⁶. In preparing the paper, the authors conducted surveys of Government departments engaged in deer and hunter management across Australia. The paper's co-author, Ellen Freeman, stated: "The survey results, with the exception of the Northern Territory, showed that wild deer are presenting increasing management issues and there is considerable scope for government departments to have greater engagement with recreational hunters".

A number of Government and Non-Government agencies (Parks Victoria, Catchment Management Authorities, Landcare etc..) conduct 'deer forums' across Victoria, typically in response to concerns from regional communities that are experiencing an increase in contact with wild deer¹⁷. Invariably well intentioned, the quality of information and discussion at these forums is widely variable and they suffer from a lack of strategy and co-ordination. There is a danger that these forums will inadvertently exacerbate the level of misinformation about wild deer management in the community. These programs would benefit from co-ordination and oversight to ensure the consistency and quality of information. Given the divergent range of stakeholders and needs, the Game Management Authority is the agency best placed to co-ordinate these forums.

There are some excellent and relevant resources available for communities that have been developed by community groups. An example of this is the Information Pack compiled by the Upper Murray Landcare group¹⁸. It would be valuable for standardised information in this vein to be available state-wide.

Recreational hunters killed more than 57,000 wild deer in Victoria in 2014¹⁹, an increase from just over 50,000 in 2013²⁰. It is expected that this number will increase to around 70,000 in the next published report. The increase in recreational harvest

¹⁴ McGhie C, 2016, *Sustainable use of wild deer under current Queensland legislation – is it achievable?*, Research into deer genetics and environment.

¹⁵ Game Management Authority, 2014, *Responsible hunting flyer*, <http://www.gma.vic.gov.au/__data/assets/pdf_file/0006/315267/A4-hunting-ad-updated-250116.pdf>

¹⁶ Freeman E and Finch N, 2016, *Regulatory control of deer in Australia*, Central Queensland University

¹⁷ Sullivan K, April 2016, *Exploding Sambar deer population have Victorian farm under siege*, The Weekly Times, <<http://www.weeklytimesnow.com.au/news/national/exploding-sambar-deer-population-have-victorian-farm-under-siege/news-story/8c557dc93bf74d50415b6a00d4faac11>>

¹⁸ Krusche D, April 2016, *Group strikes on feral deer*, The Border Mail, <<http://www.bordermail.com.au/story/3863444/group-strikes-on-feral-deer/>>

¹⁹ Moloney PD and Turnbull JD, 2015, *Estimates of harvest for deer, duck and quail in Victoria: results from surveys of Victorian game Licence holders in 2014*, Game Management Authority

²⁰ Moloney PD and Turnbull JD, 2013, *Estimates of harvest for deer, duck and quail in Victoria: results from surveys of Victorian game Licence holders in 2013*, Arthur Rylah Institute for Environmental Research

correlates to the increase in licensed deer hunters, with the average harvest per hunter not increasing markedly in recent years.

Animal welfare is an important consideration for hunters. Licensed game hunters are aware of, and bound by, the Code of Practice for the Welfare of Animals in Hunting and the Prevention of Cruelty to Animals Act. The Victorian Hunting Guide, which is issued to all licensed hunters, clearly outlines hunters' obligations. Further to legal obligations, hunters take pride in effecting a swift and humane death for their quarry with a 'one shot kill' being the desired conclusion of a hunt. Game hunters regularly practise their marksmanship and have a deep understanding of their quarry's anatomy and the best shot placement to effect a humane death.

Victoria has a long history of access to public land for recreational deer hunting; deer have been hunted on public land in Victoria since at least the late 1870s²¹, and have been widely hunted in the East of the State since the 1950s²².

Game hunting in Victoria has a unique, egalitarian culture. Hunters from across Australia and from overseas regularly travel to Victoria²³ to enjoy the public land access to sambar deer, which are a highly prized game animal. Game licensing in Victoria is affordable and enables equitable access to participants like few other places on earth²⁴.

Recreational hunting in Victoria has an exceptional safety record. In 2010, the Victorian Institute of Forensic Medicine conducted a review of external cause sporting-related fatalities listed on the National Coroners Information System (NCIS) database for the decade between 2000 and 2010. Hunting featured in less than 0.85% of incidents, and land users other than hunters did not feature in any of the hunting related fatalities²⁵.

Recreational hunting is an essential element of sustainable use. It is recognised internationally that wildlife conservation and management models based on hunting are the most sustainable and effective²⁶.

Hunting is an important social, cultural and economic activity. Hunting contributes in excess of \$439million annually to the Victorian economy²⁷.

Hunters as a cohort are generally reflective of society in general. Contrary to commonly held stereotypes, the 'average' Victorian hunter lives in metropolitan

²¹ Bentley AR, 1998, *An Introduction to the deer of Australia*, Australian Deer Research Foundation Ltd, Melbourne

²² Bentley AR, 1998, *An Introduction to the deer of Australia*, Australian Deer Research Foundation Ltd, Melbourne

²³ Deer Research Project, 2012, Summary of University of Queensland Hunter Survey – Responses to 20 July 2012, University of Queensland, <<http://ssaa.org.au/assets/news-resources/hunting/summary-of-university-of-queensland-hunter-survey.pdf>>

²⁴ October 2014, *Hunting and Game Management Action Plan*, Government of Victoria

²⁵ Crockett L, August 2010, *Australian External Cause Deaths While Engaged In Hunting Activities between 1 July 2000 – 1st August 2010*, Victorian Institute of Forensic Medicine

²⁶ Webb G, Cooney R, 16 July 2015, *Trophy hunting for conservation*, The Ethics Centre <[http://ethics.org.au/on-ethics/blog/july-2015-\(1\)/trophy-hunting-for-conservation](http://ethics.org.au/on-ethics/blog/july-2015-(1)/trophy-hunting-for-conservation)>

²⁷ Department of Environment and Primary Industries, 2014, *Estimating the economic impact of hunting in Victoria in 2013*

Melbourne, has a spouse and children, a tertiary education and earns higher than the average wage²⁸.

²⁸ McLennan C, June 2014, *Survey explodes myth hunters are all beer-swilling rednecks*, The Weekly Times <
<http://www.weeklytimesnow.com.au/news/national/survey-explodes-myth-hunters-are-all-beerswilling-rednecks/news-story/f2c7465c81473b25282967fb408a53c3>>

ASSESSMENT OF THE BIODIVERSITY OUTCOMES, COMMUNITY SAFETY AND LIMITATIONS OF THE TRIAL CONDUCTED BY PARKS VICTORIA ON CONTROL OF DEER POPULATIONS IN A NATIONAL PARK

ADA is currently involved in two trial programs (Alpine National Park/Bogong High Plains and Wilsons Promontory National Park) and three control programs (Yellingbo Flora and Fauna Reserve/Warramate Hills Nature Conservation Reserve/Dandenong Ranges National Park, Trevertons/Mitchell River NP, Red Bluff/Lakes Coastal Park) under the direction of Parks Victoria on Crown land²⁹. In addition, ADA has been involved for the past decade in deer monitoring programs at Suggan Buggan and Mount Buffalo, and conservation projects such as the revegetation of the Clydebank Morass State Game Reserve and deer exclusion fencing below Lake Mountain.

ADA is also involved in a number of deer control programs on private land in conjunction with Trust for Nature, Landcare Groups, Catchment Management Authorities and individual private landowners.

Biodiversity outcomes vary from program to program but tend to be greater on programs where there are fewer artificial constraints (access times, hunting areas, supervision, etc..) placed on the hunters involved.

We believe that all control programs (whether they are using volunteers or paid shooters) should be underpinned by solid data to quantify the problem, a clear understanding of what needs to be achieved, appropriate resourcing to ensure that targets can be met, and continuous monitoring and review to ensure that programs are meeting expectations. In almost all instances, this should include monitoring of vegetation, monitoring of deer abundance and, in the case of programs utilising volunteers, monitoring of volunteer sentiment. A "checklist" before commencing a program might be:

- Is the problem clearly quantified?
- Is there a clear understanding of what is required to address the problem?
- Is the treatment possible/feasible through simply opening the area in question to recreational hunting?
- Is there robust monitoring of all species of wildlife involved in the undesired impact?
- Is there robust monitoring of the environmental asset which is being impacted?
- Is there adequate resourcing to achieve the desired outcomes?
- Is there monitoring of volunteer and community sentiment?

Of the five programs that ADA is involved in with Parks Victoria, the three control programs broadly fit these criteria; the two trial programs do not.

The vast majority of Victoria's 36,000 licensed deer hunters are excluded from participation in programs by virtue of availability to commit to rosters, etc. There are

²⁹ Garlick S, 2016, *Can volunteer hunters provide a professional approach and desired outcomes for private landowners and public land managers*, Proceedings from the Conservation through the sustainable use of wildlife conference 2016, University of Queensland

around 300 active participants in co-ordinated wildlife management programs organised through hunting organisations – less than 1% of the hunters in the State. Hunting organisations are best placed to manage efforts and broader hunter education programs, owing to the multi-faceted and trust-based relationship with members. Government support is critical to maintaining and expanding these efforts.

Sound moderators are widely used internationally by hunters. Moderators reduce the noise emitted from rifles (they do not remove noise entirely), minimising the disturbance of wildlife and the ability of alert wildlife to assess the location of a shooter (consequently increasing the possibility of hunters having the opportunity to take multiple animals). Moderators also reduce 'felt recoil', leading to more accurate shot placement and faster recovery between shots. Moderators also reduce the likelihood of hearing loss for hunters, owing to the reduction in noise levels³⁰.

Another significant limitation to effective deer management programs is the relative lack of research into the habits, population dynamics, movement and distribution of wild deer in the Victorian context. It is not feasible to properly and proactively manage deer without a clear, well-resourced strategy supported by sound and relevant research.

Conservation wildlife management initiatives should aim to address actual, rather than perceived problems, and to reduce impacts, rather than simply focussing on the number of animals removed³¹.

A lack of monitoring and, in many cases, the unaddressed impacts of other overabundant vertebrates (eastern grey kangaroos, swamp wallabies, common wombat, pigs, goats, rabbits, etc.) will limit the ability of control programs to achieve desired outcomes.

Community sentiment, particularly with regards to native animals, influences the willingness of public land managers and governments to engage in lethal control initiatives. A pragmatic approach would see any overabundant vertebrate (native or exotic; protected or pest) managed sustainably to address undesired impacts on environmental assets.

A tendency towards risk aversion, particularly within government departments, also limits the effectiveness of control programs. ADA's experience (outlined in the case studies below) is that the programs which enable the highest level of flexibility for volunteer hunters (whilst maintaining necessary controls) are the most effective.

There are a number of regulatory constraints³² limiting the ability to sustainably use the carcasses of deer (and other wildlife) killed during control programs. The inability of hunters and land managers to have carcasses processed on commercial meat

³⁰ Mac Carthy, O'Neill and Cripps, 2011, *An Investigation into the use of sound moderators on firearms for game and feral management in New South Wales*, Game Council of New South Wales

³¹ Natural Resources Management Ministerial Council, 2007, *Australian Pest Animal Strategy*, Department of the Environment and Water Resources

³² Howlett B, 2016, *Effective management of overabundant wild deer, impediments from a policy, regulatory and stakeholder management perspective*, Proceedings from the Conservation through the sustainable use of wildlife conference 2016, University of Queensland

handling premises (either for human or animal consumption) results in an unwillingness of volunteer hunters to be involved in 'shoot to waste' operations, as it is often repugnant to their personal values and ethics. In jurisdictions such as New Zealand, the United States of America and the United Kingdom, game hunters are afforded the option of having their kill processed on commercial premises.

Recreational hunting in Victoria has an exceptional safety record³³; this is reflected in deer control programs. Co-ordinated programs under the control of Parks Victoria have additional, formalised safety controls (Safe Work Method Statements, Standard Operating Procedures, etc.,³⁴) to comply with the policies and procedures of Parks Victoria and with the Occupational Health and Safety Act 2004³⁵.

Spatial separation – the practice of deer hunters dispersing over a large geographic area, typically in forested terrain with natural barriers such as hills etc., combined with the fact that deer hunters fire relatively few shots at game (an average of 2-3 shots per year, per hunter in the field) and the fact that deer hunters aim at a specified area of their quarry (therefore, positively identifying their target), contribute to recreational hunting's exceptional safety record.

³³ Crockett L, August 2010, *Australian External Cause Deaths While Engaged In Hunting Activities between 1 July 2000 – 1st August 2010*, Victorian Institute of Forensic Medicine

³⁴ Parks Victoria, Australian Deer Association Inc and Sporting Shooters Association of Australia (Vic), 2016, *Standard Operating Procedures SOP 1 – SOP 9*

³⁵ Government of Victoria, 2004, *Occupational Health and Safety Act (2004)*

CASE STUDY: Yellingbo deer management program

A deer control program in the Yellingbo Nature Conservation reserve is ongoing to address the impacts of wild deer damage to immature trees.

The reserve provides a habitat to two endangered species – the Helmeted Honeyeater and the Leadbeater's Possum. The re-establishment of young trees is particularly critical to ensure adequate habitat for the Helmeted Honeyeater.

A deer control program involving volunteers from the ADA (and recently combining with volunteers from the Sporting Shooters Association of Australia) commenced in 2014 to reduce sambar and fallow deer populations in the reserve.

Yellingbo is a small reserve on a peri-urban interface and it is generally agreed that it would not be appropriate for normal recreational hunting although hunting does occur on the surrounding private property.

Population monitoring shows a marked reduction in wild deer abundance.

There is no robust monitoring of vegetation, although it is obvious that the immature trees are becoming established in the desired numbers.

Through the program, a working relationship has developed between the volunteer hunters and the local land managers including neighbouring private landowners. A number of processes and systems have been refined for carcass recovery and hunting methodology (including the use of thermal imaging equipment during night time operations).

Control operations are conducted away from weekends and holiday periods, and minimal manning of gates and signage, coupled with situational awareness from the hunters, have addressed community safety concerns. Parks Victoria's staff have also briefed adjoining landowners and local community organisations.

The operational requirement to have Parks Victoria staff present during all operations limits the days and times available to conduct programs, particularly in light of budgetary constraints. It is feasible for Parks Victoria to hand over operational control of shoots to trained and competent volunteer co-ordinators.

	YES	NO
Is the problem clearly quantified?	✓	
Is there a clear understanding of what is required to address the problem?	✓	
Is the treatment possible/feasible through simply opening the area in question to recreational hunting?		✓
Is there robust monitoring of all species of wildlife involved in the undesired impact?	✓	
Is there robust monitoring of the environmental asset which is being impacted?		✓
Is there adequate resourcing to achieve the desired outcomes?	✓	
Is there monitoring of volunteer and community sentiment?	✓	

CASE STUDY: Wilsons Promontory deer control trial

The first trial hog deer control program was conducted by Parks Victoria using volunteers from the ADA and SSAA, and support from the Game Management Authority and DELWP from 18-20 August 2015. The Park was closed to the public at the time, due to scheduled maintenance works³⁶.

A subsequent trial program was conducted from 13-15 May 2016; the Park remained open to the public during this program.

A third trial program was conducted from 23-25 August 2016. Again, the Park was again closed to the public for maintenance works.

Hog deer numbers have increased notably on Wilsons Promontory in recent years, subsequent to two major fire events in 2005 and 2009, which have resulted in both a dispersal of the deer and an increase in preferred habitat and food species post regeneration³⁷. It is contended that the rise in the hog deer population is having a negative impact on native vegetation and providing browsing competition with native species, notably the swamp wallaby, eastern grey kangaroo and the common wombat³⁸. It should be noted that neither eastern grey kangaroos nor common wombats are endemic (indigenous) to Wilsons Promontory; the resident kangaroos are descendants of nine animals which were released into the area in 1910 and 1912³⁹, and the common wombats are descendants of five animals which were released in 1910⁴⁰. It is possible that the sand dune country of Wilsons Promontory is not suited to support populations of kangaroos for any period of time.

It has also recently been confirmed that there is a population of sambar deer present in the Park.

The trial seeks to gauge the effectiveness of ground shooting using recreational hunters as a control measure for wild hog deer populations on Wilsons Promontory.

It is too early to accurately measure any biodiversity outcomes from the Wilsons Promontory trial. It is unlikely that significant biodiversity gains will be realised unless a control program integrating other herbivores such as eastern grey kangaroos and common wombats is conducted.

Programs on Wilsons Promontory are limited by the level of control required by Parks Victoria.

³⁶ Parks Victoria, August 2015, *Protecting the health of Wilsons Prom* Media Release, <<http://parkweb.vic.gov.au/about-us/news/protecting-the-health-of-wilsons-prom>>

³⁷ Game Management Authority, November 2015, *18th-20th August 2015 Wilsons Promontory National Park Hog Deer Control Program*, <http://www.gma.vic.gov.au/_data/assets/pdf_file/0007/317437/WP-Control-Program-Report-Final.pdf>

³⁸ Game Management Authority, November 2015, *18th-20th August 2015 Wilsons Promontory National Park Hog Deer Control Program*, <http://www.gma.vic.gov.au/_data/assets/pdf_file/0007/317437/WP-Control-Program-Report-Final.pdf>

³⁹ Whelan J, January 2007, *Are kangaroos indigenous to Wilsons Promontory National Park?*, *The Victorian Naturalist*, Volume 125 – Issue 6 (December 2008)

⁴⁰ Garnet JR, May 2009, *A History of Wilsons Promontory*, Victorian National Parks Association

Wilson's Promontory National Park receives around 400,000 visitors a year⁴¹, with the bulk of visitors concentrated around Tidal River at the southern end of the park. It would not be feasible to open much of the southern areas of the park to recreational hunting in any form.

There are a number of sites towards the northern end of the park which would lend them well to balloted hunting – a highly controlled program and model used effectively on Blond Bay State Game Reserve and Boole Poole Peninsular for over 25 years. This would have multiple benefits: it would address any environmental concerns (particularly if hunters were required to take a female before taking a male animal), provide an adequate level of control (again as evidenced by the Blond Bay model) and provide an equality of opportunity for licensed hunters to participate. Such an approach would share the opportunity more equitably, ensure long term viability, and give an opportunity for cost recovery via utilising the ballot fee to cover administration, any scientific research costs and land manager oversight of the hunters and hunting area.

	YES	NO
Is the problem clearly quantified?		✓
Is there a clear understanding of what is required to address the problem?		✓
Is the treatment possible/feasible through simply opening the area in question to recreational hunting?	✓	
Is there robust monitoring of all species of wildlife involved in the undesired impact?		✓
Is there robust monitoring of the environmental asset which is being impacted?		✓
Is there adequate resourcing to achieve the desired outcomes?	✓	
Is there monitoring of volunteer and community sentiment?	✓	

⁴¹ 2010, *Tidal River – Strategic directions plan – 2010-2015*, Parks Victoria

CASE STUDY: Red Bluff Coastal Park deer control program

The Red Bluff Coastal Park is a small section of the Gippsland Lakes Coastal Park. The plant community at Red Bluff is Littoral Rainforest, which is listed as a nationally threatened ecological community under the Commonwealth's Environment Protection and Biodiversity Conservation Act 1999⁴².

A small number of sambar deer were damaging the plant community by creating game trails (breaks) in the thicket, and were also having a social impact on the nearby community courtesy of an increase in illegal hunting activity, notably spotlighting from public roads⁴³.

In 2014, a deer control program was developed by the Trust for Nature ranger, Brett Mills, in conjunction with Parks Victoria, using ADA volunteer recreational hunters (The ADA TfN Regional Deer Management Group). The estimated population of sambar deer in the reserve at the time was 10-12. Due to the small size of the reserve and its close vicinity to high use recreational and residential areas, it was determined that the safest option for the program would be using self-climbing high seats (shooting down from an elevated position to angle a bullet downwards into the ground, should the shot pass through an animal). Parks Victoria policies dictated that participants undertake working with heights training and operate in pairs, which placed a constraint on the number of volunteers available for the program. Appropriate sites to position the high seats and other factors (weather, etc.,) meant that programs were to be restricted to around 1% of the 100ha treatment area.

Deer control programs commenced in 2015, by which time deer numbers had fallen to an estimated 5-6. The reduction was attributed to increased human activity in the reserve and increased harvest on neighbouring private properties. Later in 2015, four more high-seat sites were approved, taking the potential control area to around 3% of the reserve. Over ten visits, the volunteer group were able to account for approximately 20% of the deer population in the reserve.

A proposal to improve efficiency and success by implementing other methods of hunting such as a 'passive drive' (unarmed hunters moving through the reserve in a line to 'push' deer towards a treatment area) or spotlighting, was rejected by Parks Victoria.

Only one visit has been conducted in 2016 owing to a number of factors – unsuitable wind direction, public and school holidays, availability of volunteers with the required training, etc. A recent estimate puts the deer population at 6, a slight increase over late 2015.

This program will likely continue to struggle to meet its objectives unless Parks Victoria approves the adoption of different methods of hunting.

⁴² 2009, *Littoral Rainforest and Coastal Vine Thickets of Eastern Australia*, Department of Environment, Water, Heritage and the Arts, < <https://www.environment.gov.au/system/files/resources/19747170-3fd3-4930-9ca5-6ca89508b571/files/littoral-rainforest.pdf>>

⁴³ Mills B, 2016, *Deer control program Red Bluff Coastal Park Interim Report*, Trust for Nature

	YES	NO
Is the problem clearly quantified?	✓	
Is there a clear understanding of what is required to address the problem?	✓	
Is the treatment possible/feasible through simply opening the area in question to recreational hunting?		✓
Is there robust monitoring of all species of wildlife involved in the undesired impact?	✓	
Is there robust monitoring of the environmental asset which is being impacted?	✓	
Is there adequate resourcing to achieve the desired outcomes?		✓
Is there monitoring of volunteer and community sentiment?	✓	

CASE STUDY: Mitchell River deer management program

The Mitchell River deer management program is conducted on the Trevertons block of the Mitchell River National Park. Trevertons is 300ha of former farming property in the Tabberabbera area of the Mitchell River National Park, which was acquired by the Victorian Government and placed under the stewardship of Parks Victoria in 2002⁴⁴. The management aim for Trevertons is to return the property back to native forest to restore biodiversity. A Green Fleet project has planted thousands of native seedlings across the site⁴⁵ and sambar deer were observed damaging the plants through browsing and antler rubbing.

Trust for Nature ranger, Brett Mills, conducted an assessment of the property and confirmed that the area was suited to a program using ADA volunteer recreational hunters (The ADA TfN Regional Deer Management Group).

Three methods of deer control were implemented – sit and wait, spotlighting and hunting from high seats.

Deer management group members hunt the property on a roster system with broad oversight but minimal direction or supervision from Parks Victoria⁴⁶.

Control programs commenced on 10 May 2014 and over six operations that season a total of 14 deer were killed.

Over twelve visits in 2015, the group took a further 31 deer.

In six operations so far in 2016, 26 more deer have been taken⁴⁷.

Vegetation monitoring was established at the commencement of the program, with the average height of trees increasing by more than one metre over the program period⁴⁸.

The deer management group on this project have operated very effectively with good strategic leadership from the TfN ranger and few artificial restraints. The major impediments to success have been environmental factors such as the damage caused to trees by other wildlife (wild bulls and kangaroos⁴⁹); fortunately, this has not been serious enough to prevent the program from achieving its objectives.

The Mitchell River deer management program is an excellent example of an effective deer management program. There is a clearly defined purpose, robust monitoring, clear strategic leadership and minimal constraints placed on the volunteer hunters.

⁴⁴ Mills B and Allen K, July 2016, *Effectiveness of deer removal at Mitchell River National Park – Interim Report 2016*, Trust for Nature

⁴⁵ July 2013, *Greenfleet News*, Edition 22, <https://issuu.com/greenfleet/docs/greenfleet_newsletter-summer_2013-f>

⁴⁶ B Mills, January 2016, pers. comm.

⁴⁷ Mills B and Allen K, July 2016, *Effectiveness of deer removal at Mitchell River National Park – Interim Report 2016*, Trust for Nature

⁴⁸ Mills B and Allen K, July 2016, *Effectiveness of deer removal at Mitchell River National Park – Interim Report 2016*, Trust for Nature

⁴⁹ Mills B and Allen K, July 2016, *Effectiveness of deer removal at Mitchell River National Park – Interim Report 2016*, Trust for Nature

	YES	NO
Is the problem clearly quantified?	✓	
Is there a clear understanding of what is required to address the problem?	✓	
Is the treatment possible/feasible through simply opening the area in question to recreational hunting?*		✓
Is there robust monitoring of all species of wildlife involved in the undesired impact?	✓	
Is there robust monitoring of the environmental asset which is being impacted?	✓	
Is there adequate resourcing to achieve the desired outcomes?	✓	
Is there monitoring of volunteer and community sentiment?	✓	

*Once the re-vegetation objectives have been met this area would be suitable for normal recreational hunting.

CASE STUDY: Lake Mountain exclusion fencing – Non lethal deer control

In early April 2016, a group of volunteers from the ADA and the SSAA joined a ranger from Parks Victoria to hike up to an alpine bog and erect deer exclusion fencing.

The bog, below Lake Mountain in Victoria provides habitat for a threatened frog species⁵⁰.

The frog species was first discovered in this bog in 2009. It is important for two reasons: this species has suffered significant declines across its known distribution and this is the only known population to be free of the amphibian chytrid fungus⁵¹.

The amphibian chytrid fungus (*Batrachochytrium dendrobatidis*) causes the disease chytridiomycosis, which is responsible for world-wide declines in amphibians⁵², and is particularly detrimental in cool climates and conditions such as the alpine areas of south-eastern Australia.

Whilst deer numbers are relatively low in the area around the bog, researchers were concerned with sambar wallowing, due to the potential it has to destroy the bog and to the possibility that sambar could wallow in a nearby bog where the chytrid fungus is present and act as a vector for it. Initially, the researchers proposed a deer control program in the area, but it was pointed out by Parks Victoria rangers that fencing would be a far more practical and achievable means of addressing their concerns.

Parks Victoria assessed the area, ordered materials and arranged for a helicopter to shuttle them in. The ADA and SSAA volunteers then joined Parks Victoria Ranger, Danny Hudson, to hike up to the bog and erect the exclusion fencing.

⁵⁰ Flora and Fauna Guarantee Act 1988 (Victoria), April 2015 list

⁵¹ Hunter D, Pietsch R, Clemann N, Scroggie M, Hollis G and Marantelli G, *Prevalence of the Amphibian Chytrid Fungus (Batrachochytrium dendrobatidis) in Populations of Two Frog Species in the Australian Alps*, NSW Department of Environment & Climate Change, Arthur Rylah Institute for Environmental Research, Department of Sustainability and Environment and Amphibian Research Centre

⁵² (Commonwealth) Department of Environment and Energy, 2013, *Fact Sheet - Chytridiomycosis (amphibian chytrid fungus disease)*, < <https://www.environment.gov.au/biodiversity/invasive-species/publications/factsheet-chytridiomycosis-amphibian-chytrid-fungus-disease>>

CASE STUDY: Clydebank Morass State Game Reserve Re-vegetation – Volunteer hunter-led habitat restoration project

Clydebank Morass State Game Reserve, to the east of Sale, has been the site of a major ADA conservation initiative over the past decade with tens of thousands of seedling shrubs and trees planted to restore native vegetation to the area.

The reserve totals 1,200 hectares (about 3,000 acres) and extends along the southern bank of the Avon River and then follows the western shore of Lake Wellington south to where it links with the Heart and Dowds Morass State Game Reserves. While much of Clydebank Morass is wetland with open water and dense stands of reeds, it also contains large areas of higher ground that had been cleared of all native vegetation and farmed for well over a century.

Clydebank Morass is important to deer hunters as it is public land that carries a small population of hog deer that can be hunted during the April open season; a population that will increase if the extensive areas of grassland on the higher ground have more covering vegetation.

Over the past eleven winters, volunteers from ADA have gathered to plant seedlings and to protect them with guards against browsing pressure from kangaroos, wallabies, wombats, rabbits, hares and deer. Large areas have also been direct seeded after the dense mat of introduced grasses has been killed with glyphosate. Funding to purchase seed, seedlings, stakes and guards has come from a number of sources, including within ADA, plus state and federal programs, with great assistance from Parks Victoria (who manage the game reserves) and Greening Australia.

Seedlings of native shrubs and trees are remarkably tough, and although some haven't made it due to drought, flood, blackberry spraying, wildlife, errant livestock and errant 4WDs, every area that has been planted has been successfully rehabilitated. However, it will take many years for these areas to return to something like their pre-European appearance – a wilderness of giant red gums, extensive paperbark thickets and an understory of native shrubs and grasses.

While it is early days yet and no dramatic increase in deer numbers is evident, a small number of deer continue to be shot in the reserve each year. The revegetation works have seen a dramatic improvement in the environment generally.

CONSIDERATION OF THE APPLICATION OF THESE TYPES OF PROGRAMS FOR OTHER INVASIVE ANIMAL SPECIES IN PARTNERSHIP WITH CROWN LAND MANAGERS

Conservation wildlife management initiatives should aim to address impacts⁵³. Any abundant or overabundant vertebrate should be considered for sustainable control programs to protect biodiversity, regardless of the legal status or indeed of perceived community attitudes towards the particular species of wildlife.

Local experience shows that control programs can be very effective on other species of wildlife on Crown land where normal recreational hunting is not feasible.

An example of this is the program operated by Parks Victoria and Sporting Shooters Association of Victoria volunteers, where rabbits are shot around the buildings at the historic Werribee Park.

⁵³ Natural Resources Management Ministerial Council, 2007, *Australian Pest Animal Strategy*, Department of the Environment and Water Resources

ASSESSMENT OF THE RELATIVE COSTS AND BENEFITS, FINANCIAL OR OTHERWISE, OF OTHER FORMS OF PEST CONTROL IN NATIONAL PARKS

ADA has a longstanding position that public land should be open for recreational hunting in the absence of a good reason for exclusion. The administration of managed control programs comes at a cost to government and to the volunteer organisations involved.

In the 2016 Victorian budget an allocation of \$75,000.00 per annum was made to assist ADA in the administration of deer management programs – the vast majority of this money is allocated to the administration (permits, rostering, oversight, and accreditation) of public land deer control programs. This expense could be significantly reduced if deer were controlled by opening areas to normal recreational hunting where there is no good reason not to do so.

Recreational hunters have a broad range of motivations. These are often mixed and occasionally contradictory. Motivations can range from simply going hunting to food harvest, conservation and damage mitigation⁵⁴.

The motivation of a hunter practising game management will be very similar to those required to manage overabundant wildlife; the aim of both is sustainability. In his landmark text on the matter, American Wildlife Biologist, Aldo Leopold, defined game management as *“the art of making land produce sustained annual crops of wild game for recreational use⁵⁵”*, whereas nearly a century later, another work by American wildlife biologists described the principles of overabundant wildlife management thus: *“Many of the ecological principles applied in managing “overabundant” populations are the same as those applied in managing positively valued wildlife. The focus is typically on the population ecology of the species of interest. At times there may be concern for whole ecosystems, but usually only as they provide support for the wildlife species of interest.⁵⁶”* In Sharon Levy's 2006 paper 'A Plague of Deer', another North American biologist, Don Waller, is quoted putting the practicalities of overabundant deer management into focus: *“We should be shooting does, not bucks... We should have longer hunting seasons and ask hunters to shoot more than one deer⁵⁷”*.

There is no clear data to prove or disprove the contention that recreational hunting has a positive impact on biodiversity. There is an apparent correlation in the forests of Eastern Victoria between the limitation of access for recreational deer hunters (either through land tenure or road closures) and the local overabundance of sambar deer.

Paid wildlife control measures can be very effective at protecting environmental assets. Large scale control measures can be relatively expensive.

⁵⁴ Deer Research Project, 2012, Summary of University of Queensland Hunter Survey – Responses to 20 July 2012, University of Queensland, <<http://ssaa.org.au/assets/news-resources/hunting/summary-of-university-of-queensland-hunter-survey.pdf>>

⁵⁵ Leopold A, 1933, *Game Management*, The University of Wisconsin Press

⁵⁶ Wagner F and Seal U, 1992, *Values, problems and methodologies in managing overabundant wildlife populations: an overview*, Wildlife 2001

⁵⁷ Levy S, September 2006, *A Plague of Deer*, BioScience Vol 56 No 9

Helicopter-based culling is untried on sambar in Victoria and is widely considered to not be feasible in heavily forested alpine terrain. It may be of use in large open areas, such as those typically associated with Alpine Bogs.

In New Zealand, where helicopters are widely used in a number of applications (tourism, forestry, aquaculture and horticulture), and, where helicopter-based culling was once commonplace, the practice is increasingly becoming economically unviable⁵⁸.

There is currently no poison registered for use on deer in Australia, and there are significant difficulties in developing a widely distributable, humane and species-specific biological control for wild deer.

⁵⁸ Warburton B, 2016, *Economic constraints of aerial commercial harvesting to control wild deer in New Zealand*, Presentation to the Conservation through the Sustainable Use of Wildlife Conference, University of Queensland

RECOMMENDATIONS

- There should be an assessment of public land in Victoria from which deer hunting is excluded, with a view to opening all land where there is no good reason to prohibit hunting.
- A state-wide strategy should be developed, adopted and properly resourced to sustainably manage wild deer populations in Victoria. Actions should focus on preventing the establishment of new populations of deer and on protecting high value environmental assets. The Game Management Authority employs specialist Game Managers and has a breadth of experience in game and hunting policy. It should be tasked and resourced as the lead agency for the development and implementation of such a strategy.
- Existing and future deer (and other wildlife) management programs involving public land managers and recreational hunters should be assessed against a series of objective criteria and resourced appropriately. An example of criteria might be:
 - Is the problem clearly quantified?
 - Is there a clear understanding of what is required to address the problem?
 - Is the treatment possible/feasible through simply opening the area in question to recreational hunting?
 - Is there robust monitoring of all species of wildlife involved in the undesired impact?
 - Is there robust monitoring of the environmental asset which is being impacted?
 - Is there adequate resourcing to achieve the desired outcomes?
 - Is there monitoring of volunteer and community sentiment?
- The Game Management Authority employs specialist Game Managers and has a breadth of experience in game and hunting policy. It should be tasked and resourced as the lead agency for the planning and oversight of deer (and other wildlife) programs.
- The use of sound moderators should be made legal for recreational rifle shooters in Victoria.
- Necessary changes to regulation should be made to allow the processing of wild shot food for human and pet consumption on commercial premises.