Government of South Australia
Department of Primary Industries and Regions

Our ref: CORP F2023/000709
Receipt No: 18303326

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31 October 2023

The Hon Heidi Girolamo MLC
Member of the Legislative Council
Parliament House
ADELAIDE SA 5000

Dear Ms Girolamo

Determination under the *Freedom of Information Act 1991*

I refer to your application made under the *Freedom of Information Act 1991* which was received by the Department of Primary Industries and Regions (PIRSA) on 12 September 2023, seeking access to the following:

> *"Copies of all procedures and policies that regulate aerial culling programs including lapsed procedures and policies. Include dates that policies or procedures were changed."*
>
> Timeframe: 1/01/2023 to 12/09/2023

On 14 September 2023, PIRSA's Senior Freedom of Information Advisor contacted your office seeking clarification of your application. It was confirmed that your application is referring to all aerial culling teams.

Further contact was made with your office indicating that, pursuant to Section 18 of the Freedom of Information Act, to locate the documents being sought would result in a substantial and unreasonable diversion of agency resources. Accordingly, your application was refined as follows:

> *"Copies of all PIRSA procedures and policies that regulate aerial culling programs including lapsed procedures and policies. Include dates that policies or procedures were changed."*
>
> Timeframe: 1/01/2023 to 12/09/2023

On 5 October 2023, further contact was made with your office by PIRSA's Senior Freedom of Information Advisor seeking clarification as to whether attachments to the policy and procedure documents are in scope of your application. On 10 October 2023, it was confirmed by your office that attachments are included.

Your application was placed on hold for a period of five days while clarification was being sought. Accordingly, the new determination due date was 17 October 2023.

PIRSA's Senior Freedom of Information Advisor has asked your office if you would accept a short extension to the determination due date due to third party consultation required to be undertaken pursuant to Section 27 of the Freedom of Information Act. The amended due date sought was 31 October 2023.

Accordingly, the following determination has been finalised.

I have located twenty documents that are captured within the scope of your request.

Determination 1

I have determined that access to the following documents is **granted in full**:

Doc No.	Description of document	No. of Pages
2	Attachment to Document 1 - pestSMART National Code of Practice for the Effective and Humane Management of Feral and Wild Deer dated 31/1/2023	20
3	Attachment to Document 1 - pestSMART National Standard Operating Procedure: Aerial Shooting of Feral and Wild Deer dated 31/1/2023	13
9	Attachment to Document 1 - Heli Surveys COVID-19 Policy and Information dated 3/1/2022	6
15	Attachment to Document 1 - Map – Session 1, 3, 4	1
19	Standing Committee on Agriculture, Animal Health Committee – Model Code of Practice for the Welfare of Animals – Feral Livestock Animals – Destruction or Capture, Handling and Marketing - SCARM Report 34 Refer to following link: Scarm 34 Feral (csiro.au)	23

Determination 2

I have determined that access to the following document is **granted in part**:

Doc No.	Description of document	No. of Pages
20	PIRSA COP for managing feral deer and SOP for a trial of aerial shooting of feral deer with advanced technology dated 26/9/2022	31

The information removed from the above document is pursuant to Clause 4(1)(a) of Schedule 1 of the Freedom of Information Act which states:

> ***"4 - Documents affecting law enforcement and public safety***
> *(1) A document is an exempt document if it contains matter the disclosure of which could reasonably be expected—*
> *(a) to endanger the life or physical safety of any person;"*

The information removed from the above document consists of the details of firearms used for aerial culling operations.

Disclosure of this information could result in criminal activity by seeking to steal the firearms during an aerial culling operation. Accordingly, there is a high likelihood that such illegal activity would endanger the life or physical safety of the officers involved in the operations and members of the community.

Determination 3

I have determined that access to the following documents is **granted in part**:

Doc No.	Description of document	No. of Pages
1	PIRSA Thermal Assisted Aerial Cull (TACC) Aerial Operations Plan, Limestone Coast, 20/3/2023 to 6/4/2023	18
11	Attachment to Document 1 - PIRSA Thermal assisted aerial culling (TACC) of feral deer – Job Safety Analysis dated 28/2/2023	6
13	Attachment to Document 1 - PIRSA Aerial Shoot Briefing - 20/3/2023 to 6/4/2023	4
14	Attachment to Document 1 - PIRSA Autumn 2022 Thermally Assisted Aerial Cull – Debrief - 20/3/2023 to 6/4/2023	4
18	Attachment to Document 1 - Department for Environment and Water Aerial Shooting Operations Plan	12

The information removed from the above documents is pursuant to Clause 4(1)(a) and Clause 6(1) of Schedule 1 of the Freedom of Information Act.

The information removed pursuant to Clause 4(1)(a) consists of the following:

Document 1:

- locations and names of the base camps for aerial culling operations
- location details of roads and gates for aerial culling operations
- maps identifying property locations for aerial culling operations
- details of firearms used during aerial culling operations

Document 18:

- locations and names of the base camps for aerial culling operations
- location details of roads and gates for aerial culling operations
- details of firearms used during aerial culling operations

Publicising the locations where feral deer could occur could result in illegal hunters accessing properties to illegally hunt the feral deer that are on the properties.

Disclosure of details of the firearms used could result in criminal activity by seeking to steal the firearms during an aerial culling operation.

Accordingly, there is a high likelihood that such illegal activity would endanger the life or physical safety of the officers involved in the operations and members of the community.

Clause 6(1) states:

> ***"6 - Documents affecting personal affairs***
> *(1) A document is an exempt document if it contains matter the disclosure of which would involve the unreasonable disclosure of information concerning the personal affairs of any person (living or dead)."*

The information removed from Documents 1, 11, 13 and 18 pursuant to Clause 4(1)(a) and Clause 6(1) consists of the names of officers, contractors and witnesses related to aerial culling operations, their position titles, email addresses and mobile telephone numbers.

The information removed from Document 14 pursuant to Clause 4(1)(a) and Clause 6(1) consists of the name of an officer/witness relating to an aerial culling incident.

Exposing this information to illegal hunters could endanger the life or physical safety of the individuals concerned. Disclosure of this information would also be an unreasonable intrusion into the privacy rights of the individuals concerned.

The information removed from Document 1 pursuant to Clause 6(1) only consists of a mobile telephone number.

As a mobile telephone number allows a person to be contacted outside of business hours and is information that is not ordinarily available to the public, the information is taken to concern the personal affairs of an individual.

Accordingly, it is considered that disclosure of this information would be an unreasonable intrusion into the privacy rights of the individual concerned.

Please note that Attachment J, as listed on page 14 of Document 1, is not included in scope of your request as it is not a policy or procedure.

Determination 4

I have determined that access to the following documents is **refused**:

Doc No.	Description of document	No. of Pages
12	Attachment to Document 1 - Wildlife Resources - Aerial Shooting Program – Firearms - Go/No Go Checklist	2
16	Attachment to Document 1 - Overview Map – March 2023 Deer Operations - Session 1	1
17	Attachment to Document 1 - Draft Operations Map – Session 4	1

Access to the above documents is refused pursuant to Clause 4(1)(a) of Schedule 1 of the Freedom of Information Act.

Document 12:

The document contains details of firearms used during aerial culling operations.

Disclosure of these details could result in criminal activity by seeking to steal firearms during an aerial culling operation.

Accordingly, there is a high likelihood that such illegal activity would endanger the life or physical safety of the officers involved in the operations and members of the community.

Documents 16 and 17:

The documents consist of maps identifying property locations of aerial culling operations.

Publicising the locations where feral deer could occur could result in illegal hunters accessing properties to illegally hunt the feral deer that are on the properties.

Accordingly, there is a high likelihood that such illegal activity would endanger the life or physical safety of the officers involved in the operations and members of the community.

Determination 5

I have determined that access to the following documents is **refused**:

Doc No.	Description of document	No. of Pages
4	Attachment to Document 1 - Heli Surveys Flight Following Procedures – Version 6 - dated June 2022	3
5	Attachment to Document 1 - Heli Surveys Late or Missing Aircraft Procedure – Version 5 - dated July 2022	2
6	Attachment to Document 1 - Heli Surveys Emergency Response Plan – Version 9 - dated March 2022	29

Access to the above documents is refused pursuant to Clause 4(1)(a), Clause 6(1) and Clause 7(1)(c) of Schedule 1 of the Freedom of Information Act.

With respect to Document 4, pursuant to Clause 4(1)(a), to release flight following procedures could result in illegal hunters seeking to stop the aerial culling operations program. Accordingly, there is a high likelihood that disclosure of this information would endanger the life or physical safety of staff members and contractors of a company providing aerial culling operations.

The information refused pursuant to Clause 4(1)(a) and Clause 6(1) in Documents 4, 5 and 6 consists of the names, mobile and business telephone numbers of staff members of a company conducting aerial culling operations. These exemptions also apply to satellite phone numbers for Document 4.

Exposing these details to illegal hunters would pose a safety risk to the individuals concerned and be an unreasonable intrusion into the privacy rights of those individuals.

Clause 7(1)(c) states:

> *"**7 – Documents affecting business affairs***
> *(1) A document is an exempt document –*
> *(c) if it contains matter –*
> *(i) consisting of information (other than trade secrets or information referred to in paragraph (b)) concerning the business, professional, commercial or financial affairs of any agency or any other person; and*
> *(ii) the disclosure of which –*
> *(A) could reasonably be expected to have an adverse effect on those affairs or to prejudice the future supply of such information to the Government or to an agency; and*
> *(B) would, on balance, be contrary to the public interest"*

The documents contain the business affairs of a company.

In addressing the public interest test requirement for the Clause 7(1)(c) exemption, I have balanced the following factors:

In favour of the public interest:

- Meeting the objects of the Act favouring access to documents.
- Ensuring optimal use of public resources.
- High level of interest in the accountability of public office holders.
- The importance of transparency and openness and the interest that the public has in the decision-making processes of Government.
- High level of media and community interest in the subject matter.

Contrary to the public interest:

- Pursuant to Section 27 of the Freedom of Information Act, consultation was undertaken on Documents 5 and 6 with the third party concerned and consent was not provided to release the documents.
- Protecting the commercial and business interests of third parties.
- The recent age of the documents and the ongoing relevance of the matters was considered.
- Disclosure of this information would reveal detail which is considered commercially sensitive to the company concerned.

- The highly specialised work has been developed by the company through years of experience and disclosure would diminish the company's competitive edge when competing for work.
- If third parties cannot be assured of confidentiality by Government with respect to commercially sensitive information, this would have the potential to harm business relationships with Government and hamper future dealings with agencies for the betterment of South Australia.
- Disclosure of this information would be expected to prejudice the future supply of information to Government, as the level of trust in handling such information would be substantially diminished.

Having considered the various factors weighing for and against disclosure, I have determined that disclosure of these documents would, on balance, be contrary to the public interest.

Determination 6

I have determined that access to the following documents is **refused**:

Doc No.	Description of document	No. of Pages
7	Attachment to Document 1 - Heli Surveys Safe Work Method Statement – Thermally Assisted Aerial Culling Operations – Version 4 – Development/Review date 28/12/2021	20
8	Attachment to Document 1 - Heli Surveys Safe Work Method Statement – 2 Shooter TACC Operations – Version 2 - dated February 2023	4
10	Attachment to Document 1 - Heli Surveys – General Risk Register – Version 3 - dated June 2022	18

Access to the above documents is refused pursuant to Clause 7(1)(a), Clause 7(1)(b) and Clause 7(1)(c) of Schedule 1 of the Freedom of Information Act.

Clause 7(1)(a) states:

> ***"7—Documents affecting business affairs***
>
> *(1) A document is an exempt document—*
>
> *(a) if it contains matter the disclosure of which would disclose trade secrets of any agency or any other person;"*

Disclosure of these documents would disclose trade secrets of a business.

To release this information would damage the company's competitive ability when competing for work of a similar nature.

Clause 7(1)(b) states:

> ***"7—Documents affecting business affairs***
>
> *(1) A document is an exempt document—*
>
> *(b) if it contains matter –*
>
> *(i) consisting of information (other than trade secrets) that has a commercial value to any agency or other person; and*
>
> *(ii) the disclosure of which –*
>
> *(A) could reasonably be expected to destroy or diminish the commercial value of the information; and*
>
> (B) *would, on balance, be contrary to the public interest"*

In addressing the public interest test for the Clause 7(1)(b) exemption, I have balanced the following factors:

- Meeting the objects of the Act favouring access to documents.
- Ensuring optimal use of public resources.
- High level of interest in the accountability of public office holders.
- The importance of transparency and openness and the interest that the public has in the decision-making processes of Government.
- High level of media and community interest in the subject matter.

Contrary to the public interest:

- Pursuant to Section 27 of the Freedom of Information Act, consultation was undertaken with the third party concerned and consent was not provided to release the documents.
- Protecting the commercial interests of third parties.
- The recent age of the information was considered and the continuing relevance of the matters.
- The information has commercial value to the business as it is valuable for the purposes of carrying on the commercial activity.
- The information is valuable because it is essential to the profitability of a continuing business operation.
- The documents outline the company's risk management strategies for highly specialised work. Disclosure of this information would diminish the company's competitive edge when competing for work.
- The release of this information would destroy the commercial value of the highly specialised work that has been developed through years of experience.

Having considered the various factors weighing for and against disclosure, I have determined that disclosure of this information would, on balance, be contrary to the public interest.

With respect to Clause 7(1)(c), the documents contain the business affairs of a company.

In addressing the public interest test requirement for the Clause 7(1)(c) exemption, I have balanced the following factors:

In favour of the public interest:

- Meeting the objects of the Act favouring access to documents.
- Ensuring optimal use of public resources.
- High level of interest in the accountability of public office holders.
- The importance of transparency and openness and the interest that the public has in the decision-making processes of Government.
- High level of media and community interest in the subject matter.

Contrary to the public interest:

- Pursuant to Section 27 of the Freedom of Information Act, consultation was undertaken with the third party concerned and consent was not provided to release the documents.
- Protecting the commercial and business interests of third parties.
- The recent age of the documents and the ongoing relevance of the matters was considered.
- Disclosure of this information would reveal detail which is considered commercially sensitive to the company concerned.
- The highly specialised work has been developed by the company through years of experience and disclosure would diminish the company's competitive edge when competing for work.
- If third parties cannot be assured of confidentiality by Government with respect to commercially sensitive information, this would have the potential to harm business relationships with Government and hamper future dealings with agencies for the betterment of South Australia.
- Disclosure of this information would be expected to prejudice the future supply of information to Government, as the level of trust in handling such information would be substantially diminished.

Having considered the various factors weighing for and against disclosure, I have determined that disclosure of these documents would, on balance, be contrary to the public interest.

In addressing the second part of your application, with respect to Document 2, I am advised that the "National Code of Practice for the Effective and Humane Management of Feral and Wild Deer":

- has been in place since 30 January 2023;
- replaced the "National Code of Practice for Humane Destruction of Feral Livestock Animals" which was in place until 30 January 2023; and
- replaced the document titled "PIRSA COP for managing feral deer and SOP for a trial of aerial shooting of feral deer with advanced technology" (refer Document 20) which was in place until 30 January 2023.

If you are dissatisfied with this determination, you are entitled to exercise your right of review and appeal as outlined in the attached documentation Making a Freedom of Information Application | State Records of South Australia (archives.sa.gov.au), by completing the "FOI Application Form for Internal Review of a Determination" and returning the completed form to:

Freedom of Information Principal Officer
Department of Primary Industries and Regions
GPO Box 1671
ADELAIDE SA 5001

or via email PIRSA.FOI@sa.gov.au

In accordance with the requirements of Premier and Cabinet Circular PC045, details of your application, and the documents to which you are given access, will be published in PIRSA's disclosure log. A copy of PC045 can be found at http://dpc.sa.gov.au/__data/assets/pdf_file/0019/20818/PC045-Disclosure-Log-Policy.pdf

If you disagree with publication, please advise the undersigned in writing within fourteen calendar days from the date of this determination.

Should you require further information or clarification with respect to this matter, please contact Ms Lisa Farley, Senior Freedom of Information Advisor on 8429 0422 or email PIRSA.FOI@sa.gov.au.

Yours sincerely

Michelle Griffiths
Accredited Freedom of Information Officer
DEPARTMENT OF PRIMARY INDUSTRIES AND REGIONS

NATIONAL CODE OF PRACTICE FOR THE EFFECTIVE AND HUMANE MANAGEMENT OF FERAL AND WILD DEER

Information current as of 31 January 2023

Reference as:

Terrestrial Vertebrate Working Group. 2023. National Code of Practice for the Effective and Humane Management of Feral and Wild Deer. Australia.

Available for download at **pestsmart.org.au/toolkits/feral-deer/**

Associated documents (referred to as associated SOPs) relating to the National Code of Practice for the Effective and Humane Management of Feral and Wild Deer include:

- National Standard Operating Procedure: Aerial Shooting for Feral and Wild Deer
- National Standard Operating Procedure: Ground Shooting for Feral and Wild Deer
- National Standard Operating Procedure: Trapping for Feral and Wild Deer

This document outlines best practice guidelines for the effective and humane management of feral and wild deer in Australia.

The Code of Practice (COP) outlines humane control strategies and their implementation while standard operating procedures (SOPs) describe control techniques, their application, and strategies to minimise any harmful impacts.

The national COP and SOPs comprise model guidelines that set minimum animal welfare standards. They do not override COPs and SOPs in jurisdictions where these documents have been developed, prior to or after the endorsement of these documents, to address specific management issues or to comply with relevant legislation. For example, the national-level COP and SOP for the management of feral and wild deer are not relevant in New South Wales, which currently has both state-level COP and SOPs in place (Sharp *et al*. 2022).

This COP along with associated SOPs will be reviewed by the Terrestrial Vertebrate Working Group (TVWG) within 12 months of when they were endorsed, to manage any potential risks to operations throughout the country.

Jurisdictions conducting operations for feral and wild deer control are encouraged to submit reports to the TVWG secretariat for discussion at either the 12 monthly review, or sooner if there are urgent matters that need to be raised. The reports should include:

- whether the national COP and SOPs were implemented in their jurisdiction
- whether the national COP and SOPs were effective
- apparent mistakes or oversights in the national COP and SOPs
- unintended consequences or adverse events that occurred when implementing the national COP and SOPs
- new techniques or modifications to existing techniques as a result of research or registration

These reports will form the basis of reviews by the TVWG.

This revision of the COP for feral deer management builds on the extensive work conducted by NSW over several years (see Sharp et al. 2022), which provided the springboard for expansion to a national approach. Guidance, input and reviews were provided by the multi-jurisdictional membership of the TVWG. Consultation and input were also provided by the RSPCA, veterinary experts, contractors, and operational and policy government staff.

This document has been endorsed by the Environment and Invasives Committee.

Definitions and terms

Best practice management – structured, consistent, and adaptive approach to the humane management of pest animals aimed at achieving enduring and cost-effective outcomes. 'Best practice' is defined as the principles and techniques based on both scientific information and experience (e.g. Braysher 2017).

Euthanasia – meaning 'good death' when used in pest animal control terms; it refers to how the animal is killed rather than the reason for killing it (Morton 2010; American Veterinary Medical Association 2020).

Humane – The 'humaneness' of a pest animal control method refers to the overall welfare impact that the method has on an individual animal. A relatively more humane method will have less impact than a relatively less humane method (see PestSmart 2021).

Pest animal – native or introduced, wild or feral, non-human species of animal that is troublesome locally, or over a wide area, to one or more persons, either by being a health hazard, a general nuisance, or by destroying food, fibre, or natural resources.

Welfare – the physical and emotional state of an animal; pain and suffering are important aspects of poor welfare outcomes; assessing welfare of animals will consider their nutritional, environmental, health, behavioural, and mental needs (e.g., Broom 1999; Littin *et al.* 2004).

CONTENTS

PREFACE

The Code of Practice (COP) provides information and guidance to government agencies, land managers, and pest animal controllers who are managing feral and wild deer (hereafter 'feral deer') in Australia. The aim is for pest control programs to be conducted in a way that reduces feral deer impacts using the most humane, target-specific, and effective means as practicable.

Previously published COP and associated SOPs for feral deer management are available via the PestSmart website (https://www.pestsmart.org.au/). This revision of the COP for feral deer management builds on the extensive work conducted by NSW over several years (see Sharp *et al.* 2022), which provided the springboard for expansion to a national approach. This national COP and associated SOPs provide the most relevant and up-to-date information to support best practice approach to feral deer management for all regions.

This COP and associated SOPs also cover the activities of recreational or sporting shooters in some jurisdictions, but not in others, as specified by jurisdictional legislation. This COP also recognises that differences exist among jurisdictions in their approaches to managing feral deer. For example, access to suppressors for firearms varies among jurisdictions. Variations and modifications to pest control techniques among jurisdictions will be reflected in jurisdiction-specific COP and SOPs, which take precedence over the national versions.

INTRODUCTION

Pest animal management activities aim to minimise animal suffering while optimising the population impact of a pest control program. Minimising animal suffering is a priority regardless of the status given to a particular pest species or the extent of the damage or impact they create.

A **Code of Practice (COP)** provides overarching context for the management of feral and wild deer in Australia. The COP encompasses all aspects of controlling a pest animal species as determined by best practice principles, relevant biological information, guidance on choosing the most humane and appropriate pest control technique, and how to effectively implement management programs. This COP provides guidelines for feral deer management and is based on current knowledge and experience of feral deer control programs. Importantly, it includes information on relatively new control methods, based on current knowledge.

The **Standard Operating Procedures** (SOPs) associated with this COP will provide procedural details for pest animal control and ensures a humane approach (including the recognition of, and attention to, the welfare of animals directly or indirectly affected by pest control programs) is applied. SOPs are written for each pest control technique in a way that describes the procedures involved for specific control methods, as applied to a nominated pest animal species, and the relevant animal welfare issues. They provide a guide to support and improve pest control programs.

BEST PRACTICE IN PEST ANIMAL MANAGEMENT

From an animal welfare and management perspective it is desirable that pest control programs are efficient, effective, and coordinated. These attributes are required to reduce or eradicate pest populations and avoid the need for repeated large-scale killing for pest control. The approach to managing pest animals continues to evolve as lessons are learned and new tools and information become available. The emerging best-practice approach aims to reduce or eradicate pests based on measurable economic and environmental cues.

Pest animal control is one aspect of an integrated approach to the management of production and natural resource systems; management of other factors may be required to achieve a desired result. For example, lamb production may be affected by weed control and nutrition in addition to predators. When planning pest animal management, important steps to consider include identifying:

1. triggers for undertaking pest animal management. Are there community or political pressures to act or not act on pests, an expectation that pest animals should or should not be controlled? Pest control is unlikely to be effective unless strong local or broader will exists for action, including committing the necessary resources
2. the lead agency to take responsibility for bringing together and engaging with all stakeholders including other relevant government departments, animal welfare regulators, relevant community groups, landholders, shooting associations
3. the problem. Pest management is complex and understanding the nature of the problem is important for planning purposes. For example, the problem could be impacts on native plants or animals, agricultural productivity, or aesthetic impacts (e.g., landscaping). Many factors, in addition to pest control, will intersect with the problem
4. the area of concern. It can help to remove agency and property boundaries (nil tenure) so that the problem is viewed at the landscape-level, rather than at the level of individuals, groups, or agencies. Landscape-scale assessment is also required because

pest animals move large distances and can cross jurisdictions. Property and agency boundaries can be addressed when agreement is reached on the approach

5. management units for planning and prioritising efforts. Units will be determined by water bodies, mountain ranges, fences, habitat preferences, vegetation, resources, urban density, and other landscape features. While it is preferable to work in units that will restrict the movement of pests, it may not be practicable

Implementing effective and humane pest animal control programs requires a basic understanding of the ecology and biology of the targeted pest, other species that may be affected directly (non-target animals), or indirectly (e.g., prey species of pest carcasses) by a pest control program. Managers should make themselves aware of such information (see references at the end of this document for recommended reading). Pest animal control programs are usually not implemented until the impacts of the pest animal are no longer tolerated. However, pest animal control programs that are implemented prior to this point, when the population of the target pest are low, have a greater opportunity to be successful in eradication from that area. Proactively targeting pests with low population densities also reduces the overall number of animals controlled, compared to reactive controls, which is an important animal welfare consideration.

ANIMAL WELFARE AND HUMANENESS

The humaneness of a pest control technique is influenced by the experience and skills of the pest controller. Attention to detail is necessary for delivering effective programs with humane outcomes. Details should be followed for the timing and coordination of the pest control, bait delivery methods, lethal dose rates, and type or calibre of firearm and ammunition used in pest control programs. This COP and the associated SOPs provide a guide to the application of pest control methods, which will minimise and prevent the risk of negative welfare impacts for target and non-target animals.

Sharp and Saunders (2008; 2011) and PestSmart (2021) provide resources for assessing the relative humaneness of each pest animal control method. The assessment can be applied to any pest control technique. A 'humaneness assessment' can also be conducted to evaluate the impact of a pest control technique on individual animals; the humaneness assessment is based on:

1. Nutrition – water or food deprivation, malnutrition
2. Environmental – exposure to excessive heat or cold
3. Health – disease or physical injury
4. Behaviour – spatial or interactive restriction
5. Psychological – includes impacts from the first four domains (e.g., thirst, hunger, anxiety, fear, nausea, pain, boredom, depression, frustration, loneliness, distress) and any other cognitive awareness of external factors

Compromise in one or all the physical indicators (i.e., nutrition, environment, health, behaviour) is used to infer potential negative psychological impacts. The assessment can be applied to different methods and the outcomes used to inform management.

Another important animal welfare consideration when conducting pest control pest programs is to target the pest populations when they are small. This approach will reduce the overall number of animals destroyed in the pest control, compared to enacting programs only after the impacts become problematic. Most people consider the management of pest animals to be acceptable if the activities are humane and justified (e.g., Mellor & Littin 2004). Pest controllers also need to continuously

improve their approach to pest control, including trialling and updating techniques with new, increasingly humane, and cost-effective approaches as they emerge.

MANAGEMENT OF FERAL DEER

Background

Australia has wild populations of six deer species: fallow deer (*Dama dama*); red deer (*Cervus elaphus*); sambar deer (*C. unicolor*); rusa deer (*C. timorensis*); chital deer (*Axis axis*); hog deer (*A. porcinus*). These species differ in their habitat preferences, reproductive biology, population growth rates, group size, and movements (Forsyth *et al*. 2017). Different species, and assemblages of species, occur among the states and territories. Evidence of population growth exists for multiple species in many regions; for example, increases in distribution and abundance are reported for NSW, QLD, VIC, TAS, and SA. It is estimated that feral deer populations in Australia increased from a total of 200,000 in 2000 to 2 million in 2021.

Impacts from feral deer include damage to native plants, competition with native animals, economic losses to primary industries (crops, pastures, horticulture, plantations), and human safety risks from vehicle collisions. Further, feral deer are potential reservoirs and vectors of exotic animal diseases, such as foot-and-mouth disease.

Further information:

- PestSmart: https://pestsmart.org.au/resources/
- Invasive Species Council: https://invasives.org.au/our-work/feral-animals/feral-deer/

Primary and supplementary control techniques

Primary techniques are those used to achieve rapid population knockdowns over large areas in a cost-effective manner. Supplementary techniques help to suppress the population in the longer term.

Aerial shooting of feral deer is a primary technique as it removes many animals quickly over large areas. Ground shooting of feral deer can also be a primary control technique when it is conducted as part of a coordinated and intensive program. Supplementary techniques include trapping and opportunistic shooting.

Spatial scale is important and will influence pest control planning and technique selection. To achieve cost efficiencies the area of pest control will usually comprise many adjoining land managers. This network is particularly important for highly mobile pests, such as feral deer.

Poorly executed pest control programs can become on-going operations that are ineffective, do little to achieve long-term beneficial outcomes, and require more animals to be killed. Common reasons for poorly executed programs include an insufficient intensity of the pest control activities using primary techniques and programs being conducted on small spatial scales of controls, leaving safe havens from which pests can breed and reinvade the control zones.

A rotation of primary and supplementary techniques may also be important. Pest animals can become familiar with particular technique (e.g., spotlight aversion), which may require use of another method (e.g., aerial shooting). Another factor to consider is the timing of pest controls; operations should exploit biological weaknesses of pest animals (e.g., a period of food and water stress, or before young are born to remove a generation). Controls may also align with the need for primary production assets to be protected when it is most vulnerable (e.g. targeting controls to minimise impacts at harvest time).

Humaneness of control techniques

Shooting

Ground shooting

Shooting is a humane pest control method when it is carried out by competent and responsible shooters. The correct combination of firearm, ammunition, and shot placement are necessary. The target animal must be within range and seen clearly – thermal and night-vision scopes can improve visibility. Wounded animals must be promptly located and euthanised. Head shots are preferred for shot placement, when conditions allow (e.g., stillness of target; DeNicola *et al*. 2019).

Dependent young should be euthanised quickly if the mother is shot. To avoid poor welfare outcomes, the intensity of shooting programs may increase before fawns are born or occur after they are weaned. This approach is not possible in all cases, particularly for species of deer without synchronised, seasonal breeding.

Rifles are the most common firearm used in ground shooting because they allow for an accurate shot over a greater distance compared to other firearm types. However, shotguns are also used in some circumstances (e.g., for feral deer caught in a trap).

In urban and peri urban areas, tranquilising darts with satellite tracking capacity can be used to sedate and locate the animal for effective removal. Sedation must only be used under the guidance of veterinarian. Hampton *et al*. (2019) has conducted a review of chemical restraints and dosage amounts for deer species in Australia. When a feral deer is anesthetised, a captive bolt may be used in urban areas where firearm restrictions apply. Carcasses of feral deer tranquilised prior to being shot are disposed of, through burial or incineration, to eliminate the risk of secondary impacts to non-target animals.

Aerial shooting

All aerial shooting programs must adhere to jurisdictional requirements, including agency SOPs and the requirements of the Civil Aviation Safety Authority (CASA 2020). Pilots and shooters undertaking aerial programs must be assessed as competent by an appropriate accreditation process relevant to the jurisdiction.

Aerial shooting of feral deer from a helicopter is a humane pest control method when:

- it is conducted by highly skilled and experienced shooters and pilots for the aerial shooting operation being undertaken
- pursuit times are minimised
- the correct firearm, ammunition, and shot placement are used
- wounded animals are promptly located and euthanised
- correct procedures are applied such as implementing a ‘flyback’ to confirm kill
- a minimum 2 shots per animal policy with the aim of ensuring a quick death

Aerial shooting programs allow for the delivery of multiple shots in quick succession to ensure a rapid death. Hampton *et al.* (2021) found that operations that mandate multiple shots per target, as well as fly-back procedures, will maximise welfare outcomes. Shots to the head can be difficult and so chest shots are typically used as well. Head shots may be taken when conditions are ideal. Aiming for other parts of the body must not be undertaken.

Rifles and shotguns are both used in aerial shooting operations, for feral deer, in Australia (PIRSA 2022; Hampton *et al*. 2021) and New Zealand (Forsyth *et al*. 2013). Both types of firearms bring different capabilities to an aerial shooting operation. Recent experience in aerial shooting programs, for feral deer, indicates that the ability to safely carry a rifle and a shotgun, allowing the shooter(s) to change guns based on the terrain and conditions, can be beneficial (PIRSA 2022).

Aerial shooting programs can use thermal equipment to enhance the detectability of feral deer and reduce risks to non-target animals (Cox *et al.* in preparation). Thermal equipment also improves the visibility of shot deer, including under vegetated canopies, enabling delivery of rapid follow-up shots as part of a minimum two shot policy and fly back procedures. The use of thermal equipment also provides immediate and detailed motion and heat signals to confirm death. Thermal equipment can be used by the shooter and/or a dedicated thermal operator.

A minimum of two shots per animal, one being a chest (heart-lung) shot, is required for aerial shooting programs. In some programs, two people are required to verbally confirm the death of each animal before moving to the next target. A confirmation of death is based on seeing no visible signs of life, such as attempting to lift head, any coordinated body movement, and eye blinking or breathing.

Trapping

Traps can be important for controlling deer in urban areas, where firearms may not be permitted or safe, and in rural areas. Clover traps can be used for trapping individual feral deer, and larger traps (corral and paddock) can be used for trapping groups of deer. Deer caught in a trap may injure themselves if they make frantic attempts to escape. Non-target animals that are caught in traps can be released unharmed; however, some animals, such as kangaroos, may suffer from capture myopathy.

Clover traps are small (around 2 m × 1 m and 1.5 m in height) and are constructed with a metal or wooden box frame with nylon netting sides and a door that slides closed when triggered. Corral and paddock traps are large (area of 0.04-4.00 ha or 400-40,000 m^2) and can be permanent or portable with hessian or shade cloth sides. The door is triggered either by remote device or trip wire; a one-way entrance can also be used. Drop net traps comprise a large square of nylon netting (about 10 cm mesh) suspended on poles by pulleys, which release the net when triggered.

Trapped animals can suffer from exposure, thirst, starvation, shock, capture myopathy, and predation; to avoid these impacts, traps should be protected from weather and inspected daily. Trapped animals must have access to water and feed when in corral and paddock traps for more than 24 hours. Traps should be established away from the view of people to prevent deer being spooked from people and their pets (e.g. dogs) that may approach the trap. Trapped animals should be approached quietly to minimise panic, stress, and risk of injury. Trapped deer should be culled as quickly and humanely as possible with a shot to the brain from a suitable firearm or by a captive bolt if firearm restrictions apply. If there are multiple animals in a trap tranquilising darts can be used to sedate the animals prior to culling under the direction of a veterinarian. Other options to reduce stress, if multiple animals are within a trap can be found in the associated SOP. If lactating females are caught in a trap dependent fawns should be killed quickly and humanely. Non-target animals should be released at the trap site unless they are injured, in which case veterinary treatment may be required. Severely injured non-target animals should be destroyed quickly and humanely.

The animal welfare outcomes of trapped deer are still poorly understood; ongoing reporting and review is required to continue to hone a best-practice approach (e.g. Hampton *et al.* 2019).

Exclusion fencing

Exclusion fencing is typically a humane, non-lethal alternative to lethal pest control. The high costs of establishing and maintaining deer-proof fences limits this technique to areas that have a significant and persistent deer problem or for the protection of small, valuable conservation or primary production assets. Exclusion fencing is an effective barrier to deer, but it can impact non-target animals by altering movement and foraging patterns and causing entanglement and electrocution. It can also create a hazard to native animals in the event of a bushfire (e.g., Long & Robley 2004).

Lethal baiting

In some jurisdictions, pesticide control trials for feral deer are underway. Pesticides are currently only approved for use on feral deer under Minor Use and Research Permits from the Australian Pesticides and Veterinary Medicines Authority. Research in New Zealand and Australia has identified several potential pesticides, which may have future application for feral deer management. Prior to any widespread baiting, pesticides will be required to be both target specific and produce consistent and humane results.

Summary

The key attributes of each pest control technique are summarised in Table 1.

Table 1 Humaneness, efficacy, cost-effectiveness, and target specificity of pest control methods (Sharp *et al*. 2022)

Method	Humaneness[1]	Efficacy	Cost-effectiveness	Specificity	Comments
Aerial shooting *Primary*	Acceptable Score: 4C (chest)	Effective	Cost-effective. More cost-effective if deer density is high	Target specific	Suitable over large spatial scales and in inaccessible country. Most effective way of achieving quick, large-scale shooting
Ground shooting *Primary*	Acceptable Score: 3A (head), 3D (chest)	Effective in low density areas	Cost-effective at low densities	Target specific	Differences in the behaviour of deer species makes some difficult to locate and shoot. Only suitable over small spatial scales
Exclusion fencing *Supplementary*	Acceptable Score: N/A	Limited	Expensive	Target specific in certain situations	Useful for protection of threatened species or high value crops. Expensive over large spatial scales
Trapping (clover traps) *Supplementary*	Acceptable Score: N/A	Not effective	Not cost-effective	May catch non-target animals	Variations in trap suitability between species. Not practical over large spatial scales. Can be used to remove problem animals
Trapping (corral and paddock traps) *Supplementary*	Acceptable Score: N/A	Effective in some situations	Cost-effective in some situations	May catch non-target animals	Variations in trap suitability between species. Can be used to remove large groups of animals
Lethal baiting *Not available*	Unknown, in trials Score: N/A	Unknown	Unknown	Depends on toxin and delivery method	No pesticides are registered for use

[1] Assessments conducted using a model to assess the relative humaneness of pest animal control methods (Sharp and Saunders 2011). Humaneness score (AB) consists of Part A - welfare impact prior to death, scale of 1 – 8, less suffering to more suffering and Part B - mode of death, scale of A – H, less suffering to more suffering. For assessment worksheets and matrix of relative humaneness scores see: Feral / wild deer control methods humaneness matrix - PestSmart

RELEVANT LEGISLATION

Vertebrate pest controllers should familiarise themselves with relevant Commonwealth, state, or territory legislation (Table 2).

Table 2 The most relevant legislation for each jurisdiction and strategic plans for the management of feral deer.

Legislation	Intent relating to feral deer
Commonwealth	
Environmental Protection and Biodiversity Conservation Act 1999	Deer are included under the EPBC Act-listed Key Threatening Process (KTP) 'novel biota and their impacts on biodiversity' due to competition, herbivory and habitat degradation impacts. A process is considered a KTP, and eligible for listing under the EPBC Act, if it threatens or may threaten the survival, abundance or evolutionary development of a native species or ecological community https://www.environment.gov.au/biodiversity/threatened/key-threatening-processes/novel-biota-impact-on-biodiversity
South Australia	
Landscape South Australia Act 2019 *Landscape South Australia Regulations 2020*	Declarations and control notices (under regulations) and the Declared Animal Policy – Feral deer (2021) for feral deer specify it is an offence to release deer into the wild; fencing and tagging standards are required for keeping of domestic deer; and land managers are required to destroy all feral deer on their land https://www.pir.sa.gov.au/biosecurity/weeds_and_pest_animals/animal_pests_in_south_australia/established_pest_animals/feral_deer
Animal Welfare Act 1985 *Animal Welfare Regulations 2012*	Prohibits cruelty to all animals; ensures animals are controlled in a humane way

New South Wales	
NSW Biosecurity Act 2016 *Biosecurity Regulation 2017*	Invasive species management is a shared responsibility for all community members. For feral deer, landowners (both private and public) are required to control feral deer to the extent necessary to minimise the risk of any negative impacts on their lands or that of their neighbours. Priority areas to reduce the impacts of feral deer are guided by the NSW Biosecurity Strategy 2013-2021 https://www.dpi.nsw.gov.au/biosecurity/managing-biosecurity/nsw-biosecurity-strategy-2021 and regional strategic pest animal management https://www.lls.nsw.gov.au/help-and-advice/pests,-weeds-and-diseases/pest-control/pest-species-control/wild-deer
Game and Feral Animal Control Act 2002	On specified public lands, deer may be hunted under a licence and with written permission issued by Department of Primary Industries NSW (via online booking system) Private land hunters, with permission to hunt from a landholder or occupier, do not require a game hunting licence, but do need a firearm licence (where firearms are used)
Threatened Species Conservation Act 1995	Feral deer (all species) are listed as a Key Threatening Process for herbivory and environmental degradation
Prevention of Cruelty to Animals Act 1979 *Prevention of Cruelty to Animals Regulation 2012*	Prohibits cruelty to all animals; ensures animals are controlled in a humane way
Western Australia	
Biosecurity and Agriculture Management Act 2007 *Biosecurity and Agriculture Management Regulations 2013* *Biosecurity and Agriculture Management (Identification and Movement of Stock and Apiaries) Regulations 2013*	All deer species are declared pests in WA. While fallow and red deer (including wapiti and elk) may be kept under a permit, all other species of deer are prohibited organisms. Fallow and red deer are assigned a Control Category of C3 - Management, requiring landholders control them on their property to alleviate their harmful impacts. It is an offence to release deer into the wild; fencing and identification standards are required to be met for keeping of deer. Land managers are required to recover escaped deer
Animal Welfare Act 2002 *Animal Welfare (General) Regulations 2003*	Prohibits cruelty to all animals; ensures animals are controlled in a humane way

Victoria	
Flora and Fauna Guarantee Act 1988	Sambar deer are listed as a Potentially Threatening Process for the reduction in biodiversity and survival of native plant taxa and ecological communities
Wildlife Act 1975	Hog, red, sambar, fallow, rusa, chital, sika and wapiti deer are defined as protected wildlife. Six species (hog, red, sambar, fallow, rusa, chital) are also declared game species for the purpose of the *Wildlife (Game) Regulations 2012.* Deer (excluding hog deer) demonstrably causing damage on private property are subject to an 'unprotection order' and can be destroyed without a licence or permit in accordance with specified conditions. Similarly, an authorisation order under the Wildlife Act enables public land managers, police officers and veterinarians to control deer when causing damage on public land in certain circumstances and in accordance with specified conditions. All other deer control activities not authorised under the 'unprotection order' and public land authorisation order require an Authority to Control Wildlife Permit.
Wildlife (Game) Regulations 2012	Deer declared to be game can be hunted under a licence where harvest method is specified (e.g. firearms, hounds). Year-long hunting season and unrestricted bag limit for all game deer species, except hog deer (one month season, limit of one male and one female). Other restrictions may apply on public land
Catchment and Land Protection Act 1994	All deer except chital, hog, red, wapiti, sika, sika–red deer hybrids, fallow, rusa and sambar, are listed as prohibited pest animals.
National Parks Act 1975	Exotic animals (including deer) in National and State parks, Wilderness Parks, and other reserves, must be exterminated or controlled
Prevention of Cruelty to Animals Act 1986 *Prevention of Cruelty to Animals Regulations 2019*	Prohibits cruelty to all animals; ensures animals are controlled in a humane way

Queensland	
Biosecurity Act 2014	Unless kept in a deer-proof enclosure, chital, fallow, red, rusa and hog deer are restricted invasive animals and are subject to control. They must not be, moved, fed, given away, sold, or released into the environment. All other deer species are prohibited matter subject to an eradication program if they are considered a significant biosecurity threat. It is an offence to deal with prohibited matter or fail to report its presence. Prohibited matter permits are available for a limited number of purposes. This Act requires everyone to take all reasonable and practical steps to minimise the risks associated with invasive plants and animals under their control (a general biosecurity obligation)
Animal Care and Protection Act 2001 *Animal Care and Protection Regulation 2012*	Prohibits cruelty to all animals; ensures animals are controlled in a humane way
Nature Conservation Act 1992	Applies (primarily) to National Parks, and also other classes of protected areas. National Parks are to be managed "to provide, to the greatest possible extent, for the permanent preservation of the area's natural condition and the protection of the area's cultural resources and values" including the management of non-native species. Activities related to the management of non-native species, including deer, must have written approval of the Chief Executive.
Forestry Act 1959	Applies (primarily) to State forests, and also other classes of protected forest areas. State forests are to be managed for "the permanent reservation of such areas for the purpose of producing timber and associated products in perpetuity and of protecting a watershed therein" including the management of pest species. Activities related to the management of pest species, including deer, must have written approval of the Chief Executive.
Australian Capital Territory	
Pest Plants and Animals Act 2005	*Cervus, Dama, Axis* and *Rusa* deer are listed as pests on the Pest Plants and Animals (Pest Animals) Declaration 2005 list No obligations exist for land managers to undertake control programs for feral deer
Nature Conservation Act 2014	No deer species can be kept as livestock without a licence
Animal Welfare Act 1992 *Animal Welfare Regulations 2001*	Prohibits cruelty to all animals; ensures animals are controlled in a humane way

Tasmania	
Vermin Control Act 2000	A Wild Fallow Deer Management Plan for Tasmania highlights a need to minimise impacts of deer in areas with significant natural values and in peri-urban areas, as well as manage impacts of deer where distributions are growing. https://dpipwe.tas.gov.au/agriculture/game-services-tasmania/wild-fallow-deer-management-plan
Nature Conservation Act 2002	Feral deer are classified as Wildlife under the *Nature Conservation Act 2002* and partly protected wildlife under the *Wildlife (General) Regulations 2010*
Wildlife (General) Regulations 2010	Fallow deer may be hunted under a licence in specified autumn hunting season (1-month antlered males, 2-month antlerless deer). Each hunter has a bag limit of 1 male and 1 antlerless deer or 2 antlerless deer. First-year males are protected and cannot be taken. Only rifle hunting is permitted. A Crop Protection Permit (CPP) is required for controlling problem deer (any sex/age) on private land where commercial crops are produced. CPP for adult male deer require a site visit by the State Department to assess damage. CPP generally not issued for antlerless deer between November to March when females are pregnant or have dependent young
Animal Welfare Act 1993 *Animal Welfare (General) Regulations 2013*	Prohibits cruelty to all animals; ensures animals are controlled in a humane way
Northern Territory	
Territory Parks and Wildlife Conservation Act 2006	Feral deer are classified as a pest (feral – prohibited entrant)
Animal Welfare Act 1999 *Animal Protection Act 2018* *Animal Welfare Regulations 2000*	Prohibits cruelty to all animals; ensures animals are controlled in a humane way

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NATIONAL STANDARD OPERATING PROCEDURE: AERIAL SHOOTING OF FERAL AND WILD DEER

Information current as of 31 January 2023

Reference as:

Terrestrial Vertebrate Working Group. 2023. National Standard Operating Procedure: Aerial Shooting of Feral and Wild Deer. Australia.

Available for download at **pestsmart.org.au/toolkits/feral-deer/**

Associated documents (referred to as associated COP and SOPs) relating to the National Standard Operating Procedure: Aerial Shooting of Feral and Wild Deer, include:

- National Code of Practice for the Effective and Humane Management of Feral and Wild Deer
- National Standard Operating Procedure: Ground Shooting for Feral and Wild Deer
- National Standard Operating Procedure: Trapping for Feral and Wild Deer

This document outlines best practice guidelines for the effective and humane management of feral and wild deer in Australia.

The Code of Practice (COP) outlines humane control strategies and their implementation while standard operating procedures (SOPs) describe control techniques, their application, and strategies to minimise any harmful impacts.

The national COP and SOPs comprise model guidelines that set minimum animal welfare standards. They do not override COPs and SOPs in jurisdictions where these documents have been developed, prior to or after the endorsement of these documents, to address specific management issues or to comply with relevant legislation. For example, the national-level COP and SOP for the management of feral and wild deer are not relevant in New South Wales, which currently has both state-level COP and SOPs in place (Sharp et al, 2022).

This SOP along with associated COP and SOPs will be reviewed by the Terrestrial Vertebrate Working Group (TVWG) within 12 months when they were endorsed, to manage any potential risks to operations throughout the country.

Jurisdictions conducting operations for feral and wild deer control are encouraged to submit reports to the TVWG secretariat for discussion at either the 12 monthly review, or sooner if there are urgent matters that need to be raised. The reports should include:

- whether the national COP and SOPs were implemented in their jurisdiction
- whether the national COP and SOPs was effective
- apparent mistakes or oversights in the national COP and SOPs
- unintended consequences or adverse events that occurred when implementing the national COP and SOPs
- new techniques or modifications to existing techniques as a result of research or registration

These reports will form the basis of reviews by the TVWG.

This revision of the COP for feral deer management builds on the extensive work conducted by NSW over several years (see Sharp et al. 2022), which provided the springboard for expansion to a national approach. Guidance, input and reviews were provided by the multi-jurisdictional membership of the TVWG. Consultation and input was also provided by the RSPCA, veterinary experts, contractors, and operational and policy government staff.

This document has been endorsed by the Environment and Invasives Committee.

CONTENTS

PREFACE

This standard operating procedure (SOP) should be read in conjunction with the overarching Code of Practice for the Effective and Humane Management of Feral and Wild Deer, to ensure that the most appropriate pest control techniques are selected and deployed in combination with other techniques, to achieve rapid and sustained reduction of pest animal populations and impacts.

This SOP builds on the extensive work conducted by NSW over several years (see Sharp *et al.* 2022), which provided the springboard for expansion to a national approach. This national SOP and the associated COP and SOPs provide the most relevant and up-to-date information to support best practice approach to feral deer management for all regions.

This SOP and the associated COP and SOPs also cover the activities of recreational or sporting shooters in some jurisdictions, but not in others, as specified by jurisdictional legislation. This SOP also recognises that differences exist among jurisdictions in their approaches to managing feral deer. For example, access to suppressors for firearms varies among jurisdictions. Variations and modifications to pest control techniques among jurisdictions will be reflected in jurisdiction-specific COP and SOPs, which take precedence over the national versions.

BACKGROUND

Aerial shooting programs

Aerial shooting of feral deer from a helicopter is used over large spatial scales and in inaccessible areas. It is a cost-effective primary method of quickly reducing feral deer populations. At a minimum, teams involved in aerial culls from a helicopter require a shooter and a pilot. An observer may be included to look for and report hazards, ensure the helicopter does not leave the approved shooting area, identify targets for the pilot, and record locations, species, and numbers of animals killed. The pilot aligns the helicopter for the optimum shot, advises the shooter when it is safe to engage, confirms kills, and advises on requirements for additional shots for humaneness purposes. Pilots and shooters undertaking aerial shooting must be assessed as competent by an appropriate accreditation process relevant to the jurisdiction.

Aerial shooting is a humane method of killing feral deer when:

- it is carried out by experienced and skilled aerial shooters and pilots
- the animal can be clearly seen and is within range of the firearm
- appropriate firearm and ammunition are used
- shots are placed in either the head (brain) or chest (heart-lung)
- using a minimum of 2 shots per animal policy
- wounded animals are promptly located and killed
- appropriate flyback procedures are applied.

The type of helicopter used in aerial shooting is dependent on jurisdictional requirements, operators, the programs being undertaken, the terrain, equipment being used and number of people in the helicopter. Crew configurations in aerial shooting operations will vary depending on the jurisdiction, equipment being used, target deer species, and the number of shooters.

Thermal imaging equipment can be used to increase the number of feral deer detected during aerial shooting programs. In areas of challenging terrain and dense vegetation, thermal imaging equipment is recommended because it can help maximise welfare outcomes for feral deer, which may be visually obscured after being shot. The thermal imagery easily reacquires the feral deer so a second shot can be taken, providing a quick humane death. This equipment can be used in aerial shooting programs through the addition of thermal equipment for the shooter, and/or through the addition of a dedicated thermal imager operator as additional crew in the helicopter. The increased rates of detection of feral deer and the distance at which feral deer can be detected at is dependent on the quality of thermal imaging equipment being used. Configuration of the crew with an additional thermal imager operator may be subject to jurisdictional requirements.

In Australia, both rifles and shotguns are used by contractors and government agencies in aerial shooting operations for feral deer. Shotguns are also routinely used on red deer in New Zealand with good welfare outcomes. Some aerial operations, in Australia, routinely carry two firearms, a rifle and shotgun, in aerial shooting operations for chital and fallow deer, enabling them to swap firearms.

Some aerial shooting operations use two shooters in the helicopter, allowing for two types of firearms (e.g. shotgun and rifle) to be used interchangeably. If using this arrangement, the two firearms are never used at the same time. Under the direction of the pilot, the presence of two shooters enables a rapid response when deer are found. For example, the pilot can advise one shooter to ‘hold fire’, turn the helicopter by 90 degrees, and advise the other shooter to engage their firearm.

Detailed investigations into maximising the efficiency of the aerial shooting operation and animal welfare outcomes will continue to feed a best practice approach to feral deer management in Australia.

APPLICATION

Aerial shooting programs

- Aerial shooting programs must comply with relevant Commonwealth, state, and territory legislation, policy, and guidelines specificallythe Civil Aviation Safety Regulations and subordinate documents.
- Helicopter operators must have approval from the Civil Aviation Safety Authority (CASA) to undertake aerial shooting operations and flying at low levels.
- Helicopter pilots must hold the appropriate licences and permits and be experienced in flying aerial operations as per CASA requirements including Part 138 (Aerial Work Operations) Manual of Standards 2020.
- Shooting of feral deer should only be performed by skilled operators who have the necessary ability and experience with firearms and who hold the appropriate licences and accreditation for the task as per CASA requirements including Part 138 (Aerial Work Operations) Manual of Standards 2020.
- Aerial shooting should only be used in a strategic manner as part of a coordinated program designed to achieve sustained effective control. A shooting operations plan must be prepared and approved by the relevant agency for each program.
- Storage, transportation, and use of firearms and ammunition must comply with the relevant legislation, policy, and guidelines.

- Aerial shooting may be affected by adverse weather conditions (e.g., strong wind, rain, low cloud).
- Shooter(s) must only engage under the direction of the pilot.
- Use of thermal equipment can increase visibility of target animals and effectiveness of program in particular in areas of dense vegetation and low light; to ensure maximum temperature differences, thermal equipment should be used in the few hours after dawn and before dusk, during autumn, winter, and spring.

ANIMAL WELFARE CONSIDERATIONS

Impact on feral deer

- Aerial shooting can be conducted with a high level of humaneness with the right skill and judgement of the shooter and observer/camera operator.
- Shooting must be conducted in a manner which maximises its effect, causing rapid death. This outcome requires appropriate use of firearms and ammunition.
- Head (brain) or chest (heart-lung) shots are to be used.
- A chest (heart-lung) shot causes tissue damage and death from haemorrhaging of major blood vessels. If the shot stops the heart functioning, the animal will rapidly lose consciousness. Correctly placed head shots cause brain functions to cease, insensibility is immediate (refer to Figure 1).
- A target animal is only shot when:
    - it is clearly visible
    - it is within effective range of shooter and the firearm and ammunition being used
    - a humane kill is probable.
- The pilot must offer the shooter the best opportunities for a humane kill. This support includes maintaining a stable shooting platform and ensuring the helicopter is aligned so that the shooter can maintain accuracy and to avoid non-lethal shots (e.g., to the spine or neck).
- If an animal is wounded, all reasonable effort must follow to ensure it is killed quickly and humanely. This follow-up is achieved by:
    - using a deliberate policy to accurately place multiple shots per animal, instead of a single shot
    - thermal cameras can help ensure no wounded animals remain in dense vegetation.
- If an animal is wounded and cannot be found to deliver a subsequent shot, all reasonable effort must follow to find and kill the injured animal quickly and humanely.
- Each shot animal must be considered dead by the shooter and the pilot or camera operator, and verbally announced as a ‘kill’ before shooting any other animal.
- The cost of ammunition, number of shots fired, and extra flying time must not deter shooters from applying the appropriate follow-up procedures.
- Aerial shooting should not be carried out if the nature of the terrain reduces accuracy or prevents the humane and prompt shooting of wounded animals.
- Thermal binoculars or cameras may assist with confirming insensibility and shot placement after an animal has collapsed.
- To minimise the risk of dependent fawns being missed, they should be targeted first.

- If female deer are shot, efforts should be made to find any dependent young and kill them quickly and humanely.
- Aerial shooting programs must be highly accountable. Apart from maintaining maximised animal welfare standards, records should be kept of number and location of animals killed, number of animals injured (not killed) and their outcome, hours flown, ammunition used, and other procedures.
- The use of suppressors or sound moderators, where jurisdictional legislation permits, can help to minimise disturbance to other feral deer in the area.

Impact on non-target animals

- Shooting is target specific and does not usually impact other species. However, a risk of injuring or killing non-target animals, including livestock, may occur if shots are taken before an animal has been positively identified. This risk is minimised by:
    - confirmation of target species must occur between at least two members of the flight crew before engaging the target.
- Sensitive livestock such as horses and pets may be frightened by gunshots, helicopter rotor noise, and downwash from the helicopter. These animals may injure themselves by running into fences or other obstacles. Pest programs should avoid shooting in areas where livestock occurs or organise their removal from the area prior to the shooting program.
- Thermal equipment may also improve detectability of animals, which may reduce pressure on non-target animals and livestock. The improved detectability using thermal equipment does vary with the quality of equipment being used.
- The use of suppressors or sound moderators, where jurisdictional legislation permits, can help to minimise disturbance to non-target animals in the area.

HEALTH AND SAFETY CONCERNS

- Aerial shooting operations must comply with the CASA requirements and jurisdictional work, health and safety legislation.
- Aerial shooting requires safety protocols to be strictly followed. Each team member must be trained and briefed on helicopter and firearm safety.
- The helicopter pilot must give a pre-flight briefing to all personnel to establish communication protocols including:
    - pre-shot manoeuvres
    - commands for firing
    - emergency procedures.
- Shooting from a helicopter can be hazardous, particularly in rugged areas. The combination of low-level flight, proximity to obstacles (trees, rocks, wires), and the use of firearms makes this activity high-risk. The risks are mitigated through:
    - adhering to an approved ‘aerial shooting safety management plan’ (ASSMP) or similar jurisdictional documents.
    - appropriate training and experience of all personnel (helicopter crew and shooter)
    - approval from landholders to undertake shooting on their property, reminders to landholders of when the shooting will occur, and notifying neighbours
    - mapping of shooting zone, buffers, and no-shoot zones
    - clear communication among flight crew

    - daily reviews of operations
    - risk assessments and operational reviews.
- Ejected ammunition must not interfere with the safe operation of the helicopter. Some jurisdictions require the fitting of a deflector plate or case catcher to the firearm.
- When not in use, firearms and ammunition must be securely stored in a manner that meets jurisdictional requirements.
- Firearms are not loaded until the helicopter is in the air and approval is given by the pilot.
- Approved helmets and hearing protection should be worn by the shooter and others in the helicopter.
- Safety glasses, or visors attached to the helmets, may be used to protect the eyes from gases and metal fragments.

EQUIPMENT REQUIRED

The following equipment is required for conducting aerial shooting operations.

Firearms and ammunition

- Firearms that will cause death of the target animals, such as rifles or shotguns will be used. The type of firearm used is at the discretion of the shooter and based on jurisdictional and operational requirements and deer species and sizes to be culled.
- The firearms must be used in accordance with CASA requirements including CASR Part 91 (general operating and flight rules), Part 92 (consignment and carriage of dangerous goods by air) and Part 138 (aerial work operations).
- Self-loading (semi-automatic) firearms are preferred, because they allow for rapid reengagement to deliver a second or subsequent follow-up shot to the target animal.
- Shotgun and rifle may be interchanged to allow for variability to suit the situation.
- When using a shotgun the minimum requirement is for a 18 inch barrel with ¾ - full choke.
- Firearms may be fitted with a red dot scope, appropriate low magnification telescopic sights, open/iron sights, red dot scope, or thermal scope.
- Shooters should select ammunition that best suits the species being targeted to achieve the humane kills. Recommended ammunition types and their capabilities are listed in Tables 1 and 2.
- Shooters should have a backup firearm on board the aircraft in case of firearm/ammunition malfunction and equipment to conduct repairs.
- The firearms need to be reliable, and well maintained.
- The accuracy and precision of firearms should be test fired before operations as well as checking the ejection of empty cartridge cases from the firearm is suitable for aerial operations.
- The shooters must ensure there is adequate amount of ammunition and loaded magazines prior to the commencement of each flight.

Table 1 Recommended minimum cartridge and distance requirements for rifles used in feral deer operations

Cartridge	Bullet weight (gr)	Max. distance (m)	Situation	Species
.308 Winchester	130	150	Open ground to dense vegetation	All species (individual animal sizes should be taken into consideration)
.308 Winchester	135			
.308 Winchester	150			
.308 Winchester	180			

Table 2 Recommended minimum cartridge and distance requirements for shotguns used in feral deer operations

Cartridge	Number of Pellets	load (gram)	Max. distance based on effective spread pattern of the projectile (m)	Situation	Species
Buckshot no. 00 (.33)	9	36-42	25	Open ground to lightly vegetated area	All Hog, Fallow, and Chital Deer Red or Rusa Deer to adult female size
Buckshot no. 00 (.33)	12				
Buckshot no. 1 (.30)	16				
Buckshot no. 2 (.27)	21				

Aircraft

- Aircraft used for aerial shooting should be manoeuvrable, fast, and responsive to allow quick follow-up of any wounded animals; it should also provide a stable platform for accurate shooting.
- Factors that may influence the type of aircraft being used in an aerial shooting operation include jurisdictional requirements, aircraft type capabilities, operational requirements, terrain, and number of personnel on board.
- GPS (global positioning systems) and computer mapping equipment with appropriate software may be used to assist in the accurate recording of information (e.g., where animals are shot, flight heights etc.) and to reduce the risk of shooting in off-target areas.

Other equipment

- Flight helmet (with intercom)
- Fire-resistant flight suit
- Safety harness
- Lace-up boots, gloves, and appropriate eye and hearing protection
- Survival kit (including a first aid kit)
- Emergency locating beacon
- Lockable ammunition box
- Suppressors/sound moderators where jurisdictional legislation permits
- Thermal cameras with a high refresh rate (>50 Hz); thermal binoculars/monocular with appropriate tether.

WEATHER CONDITIONS

- Weather conditions need to be checked, prior to take-off. Weather conditions are taken from the closest station to the intended working area or real-world observations from the flight crew and on-ground staff posted at the area of operation.
- The pilot has the final say in determining if it is safe to fly in the weather conditions.
- Thermal imaging is most effective under certain environmental/weather conditions.

PROCEDURES

- The pilot and shooters must only shoot feral deer on land where the land manager has given permission for shooting.
- Shooters must not shoot at an animal unless they are confident of a kill. Only chest (heart-lung) or head/brain shots must be used.
- When a target is positively identified, the pilot should position the helicopter as close as is safe to the target animal for a humane kill.
- The pilot should make the shooting platform as stable as possible.
- Where target animals are encountered in a mob, they should typically be shot from the back of the mob first. If this is not possible, the pilot and shooter need to communicate so they focus on the same animal Each animal must be shot at least twice, with at least one bullet placed in the heart/lung, before shooting other animals.
- The shooter must shoot an animal more than twice in the following circumstances:
    - where directed by the pilot
    - if the shooter considers it necessary
    - until a bullet is placed in the heart/lung of the animal
    - if the animal doesn't appear dead. Signs of life could include attempting to lift its head, any coordinated body movement, eye blinking or breathing.
- Each animal shot must be considered dead, with no signs of life, and verbally announced by two-crew as a "kill" before engaging another animal. Signs of life could include attempting to lift its head, any coordinated body movement, eye blinking or breathing.

- A flyback procedure is required after shooting a mob of feral deer. The procedure is to:
    - flyback over each animal shot
    - hover over each animal long enough to confirm that it has no sign of life
    - if the shooter or pilot have any doubt as to whether the animal is dead, the shooter is to shoot into the heart/lung area.
- If feral deer are detected in thick or tall timber making engagement difficult, pressure can be applied to move feral deer. Pursuit times and techniques used should considered to minimise the stress on target animals.

Target animal and shot placement

Aiming points for head and chest shots are as follows (illustrated in Figure 1)

Chest Shot

Side view

The firearm is aimed at the centre of a line encircling the minimum girth of the animal's chest, immediately behind the forelegs. The shot should be taken slightly to the rear of the shoulder blade (scapula). This angle is taken because the scapula and humerus provide partial protection of the heart from a direct side-on shot.

Head Shots

Poll position (rear view)

When aerial shooting, most head shots will be taken at this position as animals are running away from the helicopter. The firearm should be aimed at the back of the head at a point between the base of the ears and directed towards the mouth.

Temporal position (side view)

This shot is occasionally used where a second shot needs to be delivered to an injured animal that is lying on its side. The deer is shot from the side so that the bullet enters the skull at a point midway between the eye and the base of the ear.

Frontal position (front view)

This position is occasionally used when an animal faces the shooter. It should not be used for larger adult deer due to the heavier bone structure of the front of the skull. The shot is directed at a point of intersection of lines taken from the base of each ear to the opposite eye.

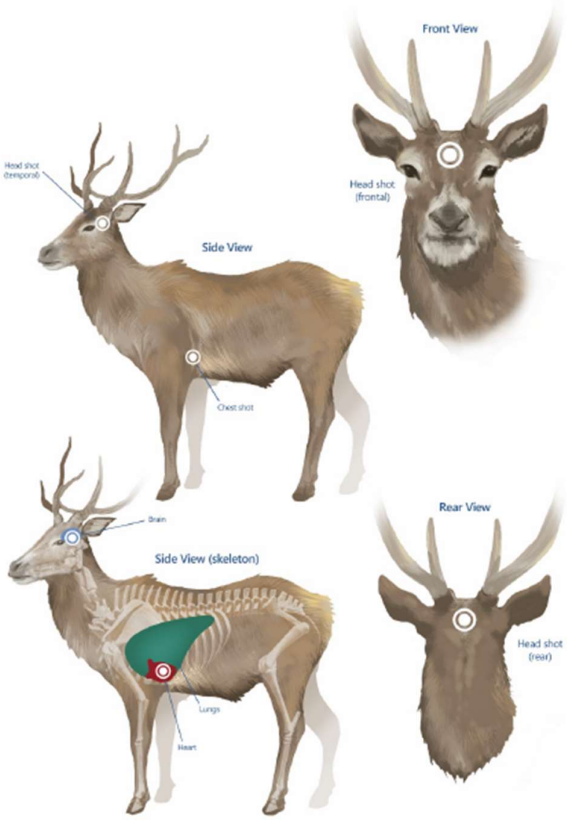


Figure 1 Shot placement for aerial shooting of deer.

Note that shooting an animal from above or below the horizontal level as depicted here will influence the direction of the bullet through the body. Adjustment to the point of aim on the external surface of the body may need to be made to ensure that the angled bullet path causes extensive (and therefore fatal) damage to the main organs in the target areas.

Heli Surveys COVID-19 Policy and Information

With the situation constantly changing, this information may be changed, altered or updated at any time. If there is any contradictory information between this document and official government advice, the latest government advice is to be followed.

Background

On 11 March 2020, the World Health Organization (WHO) declared COVID-19 a pandemic. Increasing cases of COVID-19 are now being confirmed in Australia. The situation is changing rapidly. You can access the latest information on COVID-19 from the Australian Government Department of Health here - https://www.health.gov.au

Passengers, contractor's, customers and visitors policy

ALL PASSENGERS, CONTRACTOR'S, CUSTOMERS AND VISITORS WHO HAS HAD COVID OR HAVE BEEN A CLOSE CONTACT AND NOT RECEIVED A NEGATIVE PCR TEST, OR ANYONE WHO HAS COVID 19 LIKE SYMPTOMS, WILL NOT BE ALLOWED TO BOARD AN AIRCRAFT, BE IN OR AROUND OUR HANGARS OR AT ANY OF OUR WORKSITES

We must ask each and every potential passenger or visitor if they have any COVID 19 like symptoms or are a close contact of a known case. This applies to:

- Any potential scenic flight passengers when making a booking and when arriving for the flight.
- Any (including regular) customers when booking a flight and arriving for that flight.
- When picking up any passengers from a remote location.
- Before arriving at a staging area and when arriving at that staging area.

No one is exempt from this policy

We must be aware of the impact to people's health and Heli Surveys business if one member of staff contracts COVID-19 and passess it on to others.

QR Code Check-In

It is mandatory that all customers and staff attending a Heli Surveys site/aircraft, Check-in via the Service NSW App using the QR Code that is displayed around the facilities. In instances where customers may go straight to an aircraft. QR Codes shall also be available in the aircraft (stored in the MR folder) and made available to passengers where operating or picking up away from base.

It is also encouraged that all staff and customers make use of the Service NSW App function to Check-Out when leaving a Heli Surveys site/aircraft. Note: The QR codes in use for the facilities and aircraft are now separate, to assist in minimising impacts on different operations.

Staff member being made aware they have COVID-19

You must self-isolate at home for 7 days from the date you got tested, even if you are fully vaccinated. Self-isolation means staying in your home or accommodation and remaining separated from others. Please see the NSW Health Self-Isolation Guideline for further information on how to self-isolate and what supports are available to you should you need them.

You must tell people you live with that you have COVID-19. Your household contacts must also self-isolate for 7 days.

You must also tell Heli Surveys management that you have tested positive for COVID-19. You will need to tell us the date of your test, the date you got sick (if you have symptoms), and the days you were at work whilst infectious. We will use this information to assess the risk to your fellow staff and customers. We will then inform them that they have been exposed to COVID-19, and what action they should take.

Heli Surveys will treat people that you spent time with from the 2 days before you started having symptoms or tested positive (whichever came first), as close contacts.

Policy on a "Close Contact" of someone with COVID-19

If a staff member is made aware they are a "close contact", please immediately notify management and let them know all other staff members whom you consider to be a close or casual contact.

If you are deemed to be a "close contact" (by NSW Government or Heli Surveys management) of someone who has tested positive for COVID-19 we will ask you to remove yourself from Heli Surveys operations and workplace(s), stop all physical interactions with any other Heli Surveys staff and take a Rapid Antigen Test (RAT) as soon as possible.

- If you test **Positive**, get a PCR test and isolate until you receive a negative result. If the PCR test is positive, follow the above "Staff member being made aware they have COVID-19" policy.
- If you test **Negative,** remain away from the Heli Surveys workplace(s) and staff and retake a RAT on day 6 after exposure. If this comes back negative and you have no symptoms, you may return to full duties. If you test positive on this post 6 day RAT, get a PCR test and isolate until you receive a negative result. If the PCR test is positive, follow the above "Staff member being made aware they have COVID-19" policy.
- If you have any COVID-19 **Symptoms** between day 1 and 6, get a PCR test and isolate until you receive a negative result. If the PCR test is positive, follow the above "Staff member being made aware they have COVID-19" policy.

Examples of when Heli Surveys management might deem someone a "close contact" and medium risk:

- A passenger on a crew transfer had COVID-19 and all doors were on (regardless of flight duration
- A passenger on a crew transfer had COVID-19 and the flight lasted longer than 10 minutes (regardless of whether face coverings were worn or combination of doors removed)

Policy on a "Casual Contact" of someone with COVID-19

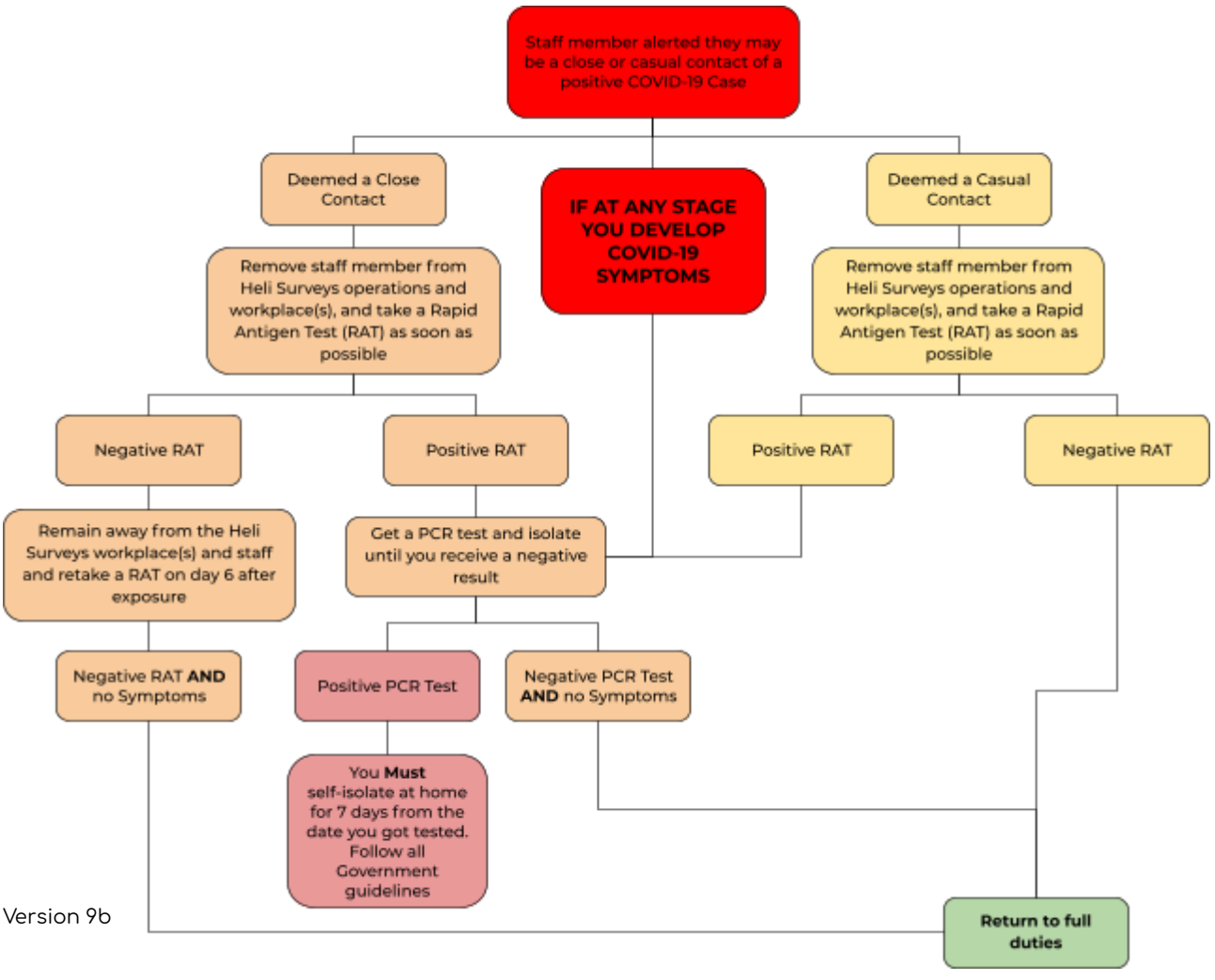
If Heli Surveys management, in consultation with the staff member, deems you to be a "casual contact" and the risk of you having COVID-19 is low, we will ask you to remove yourself from Heli Surveys operations and workplace(s), stop all physical interactions with any other Heli Surveys staff and take a Rapid Antigen Test (RAT) as soon as possible.

- If you test **Positive**, get a PCR test and isolate until you receive a negative result. If the PCR test is positive, follow the above "Staff member being made aware they have COVID-19" policy.
- If you test **Negative AND** you have no symptoms, you may return to full duties.
- If you have any COVID-19 **Symptoms**, get a PCR test and isolate until you receive a negative result. If the PCR test is positive, follow the above "Staff member being made aware they have COVID-19" policy.

Examples of when Heli Surveys management might deem someone a "casual contact" and low risk:

- Someone at a "toolbox talk" had COVID-19 while they were there, but no direct interaction was had.
- Someone at the hangar interacting with a delivery driver dropping off a package (who had COVID-19).
- A passenger on a crew transfer had COVID-19 at the time but all people were wearing face coverings, at least 1 door was removed (or slid back) and the flight lasted less than 10 minutes.

Covid Response Flow Chart



Masks

It is a NSW Government requirement that face masks or coverings be worn in many situations. In the workplace these situations for both staff and customers include:

A. In an aircraft conducting scenic and charter operations
B. In an aircraft conduction passenger and crew transfers i.e. transporting lifting crews around the area.

If any doors are removed, secure face coverings, such as buffs, shall be used instead of easily removable masks. This is to reduce the chance of a mask becoming loose and exiting the aircraft in flight.

Scenic Flights

Scenic flight operations, at our Jindabyne base, are able to recommence under the following conditions;

A. all those on the helicopter are required to wear a mask for the duration of the flight, unless a valid exemption is provided,
B. contact points are to be sanitised between each flight.

Where a voucher has been issued and due to the COVID-19 situation the customer is unable to use it, the expiry date may be extended by 12 months.

Wash Down

After all flights that have had passengers on board, regardless of their travel history, the following washdown procedure must be adhered to:

Clean with sanitister (or warm water and soap if sanitister not available)

- Headsets - Ear muffs, mic booms and muffs
- Passenger helmets - Ear muffs, mic booms and muffs
- Door handles
- Seat-belt buckles
- Flight controls, steering wheels, gear sticks
- Buttons, switches, touch screens etc..
- Fuel caps

Social distancing

The guidance from the Department of Health is to practice social distancing at all times, regardless of your health or travel history. For us in the workplace this means:

- Maintain adequate distance at morning toolbox talks
- Stop handshaking, clients will understand
- Hold essential meetings outside in the open air
- Promote good hand and sneeze/cough hygiene and use hand sanitisers/soap
- Take lunch outside rather than in the lunchroom if possible
- Clean and disinfect high touch surfaces regularly
- Consider opening windows, doors and hangar doors for maximum ventilation
- Limit food handling and sharing of food in the workplace

Hand Washing

Liquid Soap or sanitiser will be made available at all sinks and appropriate locations. It has been shown that soap is just as effective as reducing the spread of COVID-19 if proper handwashing technique is used. If available, hand sanitiser will be available on all aircraft and vehicles.

- Warm water should be used for all hand washing and all surfaces must come in contact with the soap.
- Hand washing should take at least 20 seconds.
- Wash palms, backs of hands, wrists, nails, between fingers, fingertips, thumbs.
- Disposable paper towels (if available) should be used to dry hands and to turn off taps to avoid recontamination.
- Nails should be clean and short

Flight/Crew Helmets

The sharing of helmets amongst staff is to be avoided. Where a staff member does not have their own flight helmet they are to select a company helmet, clean and sanitise it as required and utilise this as if it were their own. Usual crewmen (Jay, Christian, Tyronne, Matt etc..) are to be allocated with a company crewman helmet for the same purpose. Where previously customers had used a company crewman helmet, a company flight helmet will need to be provided to them. These must be returned and cleaned/sanitised after each use in readiness for the next customer.

Operations away from Jindabyne Base

Where operations are to be conducted away from Jindabyne Base, information should be sought as to the COVID hotspot status of that location. It may be necessary to reschedule operations to a time when the situation has improved.

Where overnighting is necessary in an area of heightened COVID status/awareness:

- Minimise public interaction where possible
- Utilise company caravan if practical and location allows
- Cook within the caravan or accomodation where available and if it allows reduced exposure to public
- Order take-away as a preference over dining in at restaurants
- Follow COVID checkin protocols for contact tracing.

It is also necessary to consider that you may be travelling into another state or area where you are considered to have travelled from an area (Jindabyne or NSW) with a threatening COVID status. You may be required to receive a negative COVID test, prior to departing. There may be additional stipulations by authorities and customers in relation to this travel. Please check with Management.

For any staff traveling to an important or high profile operation, we will require a negative COVID test result before entering that operational area.

Staff Sickness

Any staff who are feeling sick, or have any COVID 19 Symptoms, MUST stay home, self-isolate and seek a COVID Test and/or medical advice by calling their GP or call the Coronavirus Health Information Line - 1800 020 080

If due to symptoms or likely exposure you choose to, or are required to, self isolate you will be paid your full wage and this will not affect your annual leave entitlements in any way.

It is especially important, now more than ever, that you maintain good health and a strong immune system. Please try to ensure you are getting adequate amounts of sleep and eat a balanced diet.

Whilst not mandatory, it is highly recommended that all staff consider getting a COVID-19 vaccination, and boosters, to aid in minimising the risk of transmission in the workplace, and to reduce the risk of contracting COVID-19. If you have any concerns about getting the vaccine, please talk to your GP (and not FaceBook). Heli Surveys will cover any costs and time required for you to talk to a GP and/or get the vaccine.

Wages and leave entitlements

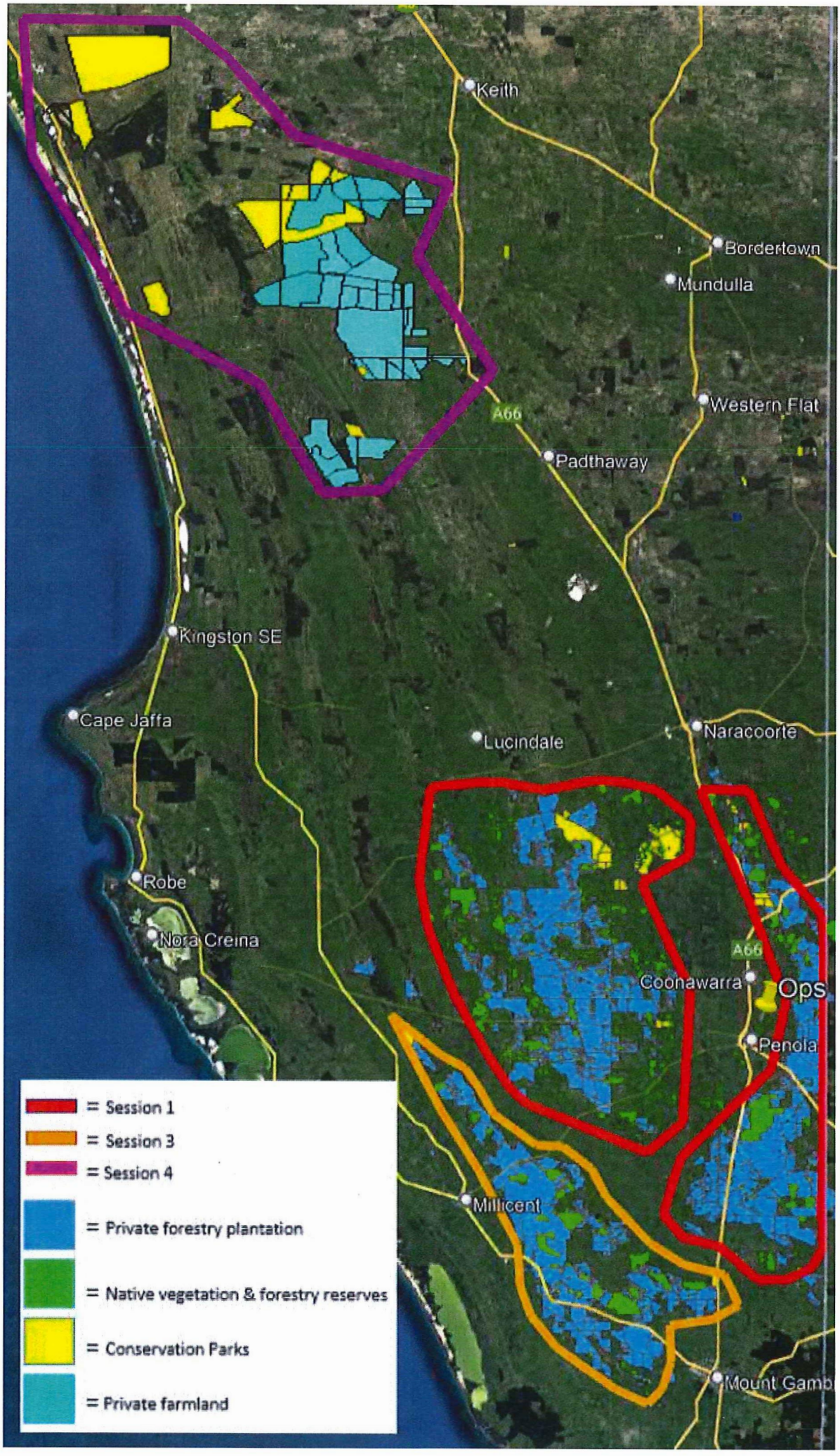
Heli Surveys will fully comply with all award and fair work requirements with regards to sick pay, leave, and other employee entitlements.

If restrictions and circumstances require it (i.e. complete lockdowns), Heli Surveys intends to continue to pay all permanent time staff, even if their entitlements are used up. Although there will be limits to this, our intention is to support all our staff as best we can, for as long as we can.

If you believe Heli Surveys is not complying with workplace entitlements and obligations, please let us know straight away.

We don't know what effects and how long this will last, if major lockdowns will be enforced or if the work we have booked in will be canceled/postponed. What we do know is that our staff is what makes us Heli Surveys. We want you to all feel confident that your welfare, both health and financially, is of the utmost importance to us.

We like to think the management of Heli Surveys is approachable and reasonable, please talk to any of us if you have concerns, questions, ideas or require further support during this uncertain time.


Keith
Bordertown
Mundulla
Western Flat
A66
Padthaway
Kingston SE
Cape Jaffa
Lucindale
Naracoorte
Robe
Nora Creina
A66
Coonawarra
Ops
Penola
Millicent
Mount Gamb
= Session 1
= Session 3
= Session 4
= Private forestry plantation
= Native vegetation & forestry reserves
= Conservation Parks
= Private farmland

Doc 20

PIRSA

PIRSA COP for managing feral deer and SOP for a trial of aerial shooting of feral deer with advanced technology

Use of TAAC, Clause 4(1)(a) , and a second marksman to improve outcomes of control operations

Government of South Australia
Department of Primary Industries and Regions

Information current as of 26 September 2022

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Contents

Preface

This Code of Practice (COP) and Standard Operating Procedure (SOP) provide current information and guidance to government agencies, land managers, and pest animal controllers involved in managing feral deer in SA. The aim is for control programs to be conducted in a way that reduces the negative impacts of feral deer using the most humane, target-specific, economic, and effective techniques available.

Previously published and endorsed COPs and SOPs for feral deer management are available via the PestSmart website (https://www.pestsmart.org.au/); they provide general guidance for national use, but some content is outdated. This revision of PIRSA-specific COP for feral deer management and SOP for trialling aerial shooting using advanced technology provide the most relevant and up-to-date information to support improvement of best practice pest animal management in SA.

Introduction

All pest animal management activities must aim to minimise animal suffering while optimising the population impact of a control program. Consideration of animal suffering should occur regardless of the status given to a particular pest species or the extent of the damage or impact they create. While the ecological and economic rationales for the control of pests such as feral deer are frequently documented, an ethical framework for their control should underpin the approach to management.

A **Code of Practice (COP)** provides overarching context for the management of feral deer in SA. The COP encompasses all aspects of controlling a pest animal species as determined by best practice principles, relevant biological information, guidance on choosing the most humane and appropriate control technique and how to effectively implement management programs. This COP provides state-wide guidance and is based on current knowledge and experience of feral deer control. It has been revised to include advances in knowledge and development of new control strategies and technologies, including Thermal Assisted Aerial Culls (TAAC).

Standard Operating Procedures (SOP) provide procedural details for each pest animal control option and ensure an ethical approach (including the recognition of, and attention to, the welfare of all animals directly or indirectly affected by control programs) is uniformly applied. SOPs are written for each control technique in a way that describes the procedures involved and animal welfare issues applicable; they provide a detailed guide to support and improve best practice control programs.

The SOP for a trial of aerial shooting of feral deer using advanced technology is required to increase the effectiveness of aerial controls for feral deer in South Australia. Use of the same approach and technology is currently being trialled by the ACT and Qld Governments and is routinely used in by the New Zealand Government and by contractors in NSW. Aerial programs for feral deer in some areas of SA, such as the Limestone Coast, have been conducted for 15 years, but the population has continued to increase dramatically. A new approach is needed. Advanced technologies provide new opportunities for lifting the effectiveness of control activities and improving animal welfare outcomes. This SOP covers the use of advances technologies in aerial control programs for feral deer, including:

- Thermal assisted aerial culling (TAAC)
- Use of a second marksman
- Use of Clause 4(1)(a) in addition to Clause 4(1)(a)

Definitions and terms

Best practice management – a structured, consistent, and adaptive approach to the humane management of pest animals aimed at achieving enduring and cost-effective outcomes. 'Best practice' is defined as the agreed principles and specific techniques at a particular time following consideration of scientific information and accumulated experience (e.g. Braysher 2017).

Euthanasia – meaning 'good death', when used in animal control terms; it refers to how the animal is killed rather than the reason for killing it (Morton 2010; AVMA 2020).

Humane – refers to an absence, or minimisation of pain, suffering and distress; an increasingly humane method of euthanasia will cause less pain, suffering, and distress than a less humane approach (RSPCA 2004). The humaneness of pest control needs to be considered for target and non-target animals.

Pest animal – native or introduced, wild or feral, non-human species of animal that is troublesome locally, or over a wide area, to one or more persons, either by being a health hazard, a general nuisance, or by destroying food, fibre, or natural resources.

Welfare – the physical and emotional state of an animal; pain and suffering are important aspects of poor welfare outcomes; assessing welfare of animals will consider their nutritional, environmental, health, behavioural, and mental needs (e.g., Broom 1999; Littin *et al.* 2004).

Best practice in pest animal management

From an animal welfare and management perspective, it is highly desirable that pest animal control programs are efficient, effective, and sustained. These attributes will dramatically reduce or eradicate pest populations and avoid the need for repeated large-scale killing for control. The approach to managing pest animals continues to evolve as lessons are learned and new tools and information becomes available. The emerging best-practice approach to pest management is a carefully planned and coordinated program, which aims to reduce or eradicate pests to a determined and acceptable level based on measurable economic and environmental cues.

Pest animal control will be one aspect of an integrated approach to the management of production and natural resource systems; management of other factors may be required to achieve a desired result. For example, lamb production may be impacted by weed control and nutrition in addition to predators. Unless pest animal control actions are well planned, collaborative, and coordinated at the right temporal and spatial scales, they are unlikely to deliver long term benefits. When planning pest animal management, important steps to consider include identifying:

1. triggers for undertaking pest animal management. Is there community or political pressure for action on pests, an expectation that pest animals should be controlled? Pest control is unlikely to be effective unless strong local or broader will exists for action, including committing the necessary resources.
2. lead agency to take responsibility for bringing together all stakeholders.
3. the problem. Pest management is complex and understanding the nature of the problem is important for planning purposes. For example, the problem could be impacts on native flora or fauna, agricultural productivity, or aesthetic impacts (e.g., landscaping). Many factors, in addition to pest control, will intersect with the problem.
4. the area of concern. It can help to remove agency and property boundaries (nil tenure) so that the problem is viewed at the landscape-level, rather than at the level of individuals, groups, or agencies. Landscape-scale assessment is also required because large pest animals can move large distances and cross multiple jurisdictions, even daily. Property and agency boundaries can be addressed afterwards when agreement is reached on the best approach.
5. management units for planning and prioritising efforts. Units will be determined by water bodies, mountain ranges, fences, habitat preferences, vegetation, resources, unban density, and other landscape features. While it is preferable to work in units that will restrict the movement of pests, it may not be practicable.

Implementing effective and humane pest animal control programs requires a basic understanding of the ecology and biology of the targeted pest, other species that may be affected directly (non-targets) or indirectly (e.g., prey species of pest carcasses) by a control program. Managers should take the time to make themselves aware of such information by reading the recommended texts included in this document.

Landscape SA Act 2019 and pest animal management

The *Landscape SA Act 2019* specifies the requirements of land managers to control declared introduced pest animals. These requirements include restrictions on the movement, selling, keeping, and releasing pest animals, as well as the requirement to control or destroy pest animals, notify, or confine declared animals. The Landscape SA (General) Regulations 2020 also requires land managers undertake specific measures relating to the captivity of animals (such as standards for fences or tags) and methods or manner of control (such as standards for baiting).

The largest populations of feral deer in South Australia are in the Limestone Coast Landscape region. In that region, the Limestone Coast Landscape Board has a position of seeking feral deer eradication, which is in line with the State Feral Deer Eradication Strategy. Feral deer control programs have been conducted in the Limestone Coast region since 2002, when the first program was conducted in Gum Lagoon CP with ADA members removing 23 deer. Ground programs remain in place with CWM Branch of SSAA on public land, but since 2008/9 the primary mode of culling has been aerial programs. Thermal Assisted Aerial Culls were trialled in 2021 with great success and the Board has invested in thermal binoculars, a hybrid approach that has increased efficiency of standard operations.

The Board has invested considerable levy funds, supported by various Australian Government programs, and culling techniques have advanced, but deer numbers have continued to increase and spread further across the region and state. The Board is expending considerable effort in “shutting the gate” on deer enclosures to prevent the supplementation of feral deer populations. There is a critical need to continue to innovate to increase the efficiency of aerial feral deer programs to increase our impact in reducing numbers and achieving our eradication target. This will require testing of new techniques, their assessment, and if appropriate, become the new standard by which we operate. This need is highlighted in the BDO Econsearch report which demonstrates the business as usual approach could cost the state in excess of $200m over the next decade. We have limited collective funds and improving efficiency of operations is critical towards achieving our goal of eradication.

The Board is keen to support new innovation that will increase the efficiency of operations. Clause 4(1)(a) Clause 4(1)(a) Clause 4(1)(a) A new SOP has been prepared for this program.

Animal welfare and humaneness

Pest animals cause significant damage and risks to the environment, agricultural production, and to public health. Annually, thousands of pest animals are trapped, poisoned, shot, or otherwise destroyed because of the harm they cause (e.g., Olsen 1998). Most people consider the management of pest animals to be acceptable, if management of the controls is humane and justified (e.g., Mellor & Littin 2004). However, pest controllers need to continuously improve their approach, including trialling and replacing techniques with new, more humane, alternatives as they are developed.

The humaneness of an individual pest control technique will be affected by the experience and skills of the controller. Attention to detail is necessary for delivering effective programs with humane outcomes. Details should be followed for the timing and coordination of the control, bait delivery methods, lethal dose rates, type or calibre of firearm and ammunition used in control programs. This COP and SOP will guide and standardise the way control methods are applied, which will minimise and prevent the risk of negative welfare impacts for target and non-target animals.

Sharp and Saunders (2008, 2011) and PestSmart (https://www.pestsmart.org.au) provide additional resources for assessing relative humaneness of pest animal control methods, which can then be applied to any control technique. A ‘humaneness assessment’ can be conducted to evaluate the impact of a control technique on individual animals; humaneness is assessed for the pest based on:

1: Nutrition – water or food deprivation, malnutrition

2: Environmental – exposure to excessive heat or cold

3: Health – disease or physical injury

4: Behaviour – spatial or interactive restriction

5: Psychological – includes impacts from the first four domains (e.g., thirst, hunger, anxiety, fear, nausea, pain, boredom, depression, frustration, loneliness, distress) and any other cognitive awareness of external challenges leading to negative affective states

Compromise in one or all the physical domains (i.e., nutrition, environment, health, behaviour) is used to infer potential negative psychological impacts. The assessment can be applied to a range of different methods and the outcomes used to inform decision making.

Management of feral deer

Background

Australia has wild populations of six deer species: fallow deer (*Dama dama*); red deer (*Cervus elaphus*); sambar deer (*C. unicolor*); rusa deer (*C. timorensis*); chital deer (*Axis axis*); hog deer (*A. porcinus*). The species differ in their habitat preferences, reproductive biology, population growth rates, group size, and movements (Forsyth *et al.* 2017); different species, and assemblages of species, occur among the states and territories. Evidence of dramatic population growth exists for multiple species in many regions; for example, increases in distribution and abundance are reported for NSW, Qld, Vic, Tas, and SA. Overall, it is estimated that the feral deer population of Australia has increased from 200,000 in 2000 to 1-2 million by 2021.

Impacts from feral deer include damage to native plant communities, competition with native wildlife, economic losses to primary industries (crops, pastures, horticulture, plantations), and human safety risks from vehicle collisions. Further, feral deer are potential reservoirs and vectors of serious livestock diseases, such as foot-and-mouth. Clear evidence of the adverse economic and environmental impacts of feral deer across Australia.

Further information:

- PestSmart: https://pestsmart.org.au/resources/
- Invasive Species Council: https://invasives.org.au/our-work/feral-animals/feral-deer/

Primary and supplementary control techniques

Pest control programs must be cost-effective, and the techniques should reduce impacts of pests. While isolated populations of pests may be eradicated, other areas will aim to reduce pest animal densities to low levels over a large area, which will minimise the need for ongoing controls and reduce rates of re-invasion. Smaller, follow-up control programs are also cheaper to implement. The control techniques are either primary or supplementary based on the status and progress of the control program.

Primary techniques are used to achieve rapid population knockdown over large areas in a cost-effective way; **supplementary techniques** occur afterwards and help to suppress the population in the longer term. Aerial shooting of feral deer is a primary technique – it removes many animals quickly over a large area. Ground shooting of feral deer can also be a primary control when it is conducted as part of a coordinated and intensive program. Supplementary techniques include trapping and opportunistic or infrequent shooting.

Regional variations will influence the control program and techniques used. For example, aerial shooting with traditional equipment needs good visibility and can be hindered by thick vegetation, whereas aerial shooting with thermal cameras is effective in densely vegetated areas. For effective control, regionally appropriate selection of at least one primary control technique and one supplementary control technique

should be utilised at a predetermined area and intensity that will suppress the population growth and drive population decline so that the numbers reach a manageable level for on-going maintenance.

Spatial scale is important and will influence control planning and technique selection. To achieve cost efficiencies the area of control will usually comprise a collaboration of many adjoining land managers. This network is particularly important for highly mobile pests, such as feral deer.

Poorly executed control programs can become sustained culling operations, which do little to achieve long-term beneficial outcomes, and require more animals to be killed. Common reasons for poorly executed programs include an insufficient intensity of control activities in the knockdown phase (primary techniques) and insufficient spatial scale of controls, which lead to not-control areas becoming safe havens and breeding areas for the pest. Unsuccessful programs can lead to sporadic implementation of crisis management programs where pest numbers have become unacceptable, but the outcome usually becomes sub-optimal.

A rotation of primary and supplementary techniques can also be important. Pest animals can become familiar to a particular technique (e.g., spotlight aversion) that may require switching to another lethal method (e.g., aerial shooting). Another factor to consider is timing of control operations; operations should exploit biological weakness of the pest animal (e.g., a period of food and water stress, or before young are born to remove a generation). Alternatively, application of control can align with the need for the commodity to be protected when it is most vulnerable (e.g. targeting controls to minimise impacts at harvest time).

Deer management methods

Integrated management using a range of control techniques produces the best results. The most used feral deer control techniques in Australia are ground and aerial shooting; trapping and exclusion fencing are employed to a lesser extent. Other techniques include repellents (including scare devices), fertility control, and poison baiting, but the effectiveness of these techniques is still poorly understood.

Humaneness of control techniques

Shooting

Ground shooting

Shooting is a humane control method when it is carried out by competent, accurate, and responsible shooters. The correct combination of firearm, ammunition, and optimum shot placement are necessary. The target animal must be within range and seen clearly – thermal and night-vision scopes will improve visibility. All wounded animals are promptly located and euthanised humanely. Head shots are the preferred shot placement, when prevailing conditions allow (e.g., stillness of target; DeNicola *et al*. 2019).

Dependent young should be euthanised quickly if their mother is shot to minimise negative welfare impacts. To avoid poor welfare outcomes, the intensity of shooting programs should increase before fawns are born or planned for after weaning. Shooting can also have negative effects on surviving animals in social groups. Skilled feral deer shooters recommend targeting the lead doe first to prevent the rest from running. This approach can enable the entire mob to be efficiently and quickly removed.

Aerial shooting

All aerial shooting programs must adhere to jurisdictional requirements, including agency SOPs, as well as with requirements of the Civil Aviation Safety Authority. Aerial shooting of feral deer from a helicopter is a humane control method when it is conducted by highly skilled and experienced shooters and pilots;

they use the correct firearm, ammunition and shot placement; and wounded animals are promptly located and euthanised. Thermal equipment improves visibility of shot deer, including under vegetated canopies, providing information on motion and heat signals used to confirm death.

With ground shooting, initial shots to the chest do not render the animal instantaneously insensible and time to death is slower, whereas a well-placed initial shot to the head to destroy the brain will result in instantaneous insensibility and quick death. With aerial shooting, chest shots are generally preferred for smaller species since the heart and lungs are the largest vital area and accurate shots to the head to destroy the brain can be difficult to achieve. This challenge is particularly the case for species (e.g., fallow and chital) that move quickly and erratically. Head shots should only be attempted when conditions are ideal to avoid wounding. Shooting at other parts of the body (outside of head and chest target zones) is unacceptable.

Compared with ground shooting, aerial shooting allows the delivery of multiple shots in quick succession to ensure a rapid death. Further, more opportunity exists for rapid follow-up shots to injured animals. A minimum of two shots per animal, one being a chest shot, is required. In some programs (e.g., TAAC in SA), two people verbally confirm the death of each animal.

Trapping

All traps have the potential to cause injury and distress, so should only be used when no practical alternative exists; for example, for in urban areas where firearms are not permitted or safe. Clover traps can be used for trapping individual feral deer, and larger traps (corral and paddock) are used for trapping groups of deer. Animals caught in a cage trap may experience significant injuries since they will make frantic attempts to escape. Importantly, non-target animals that are caught in cage traps can usually be released unharmed; small holes in the corners also allow many to escape.

Clover traps are small (around 2 m × 1 m and 1.5 m in height) and are constructed with a metal or wooden box frame with nylon netting sides and a door that slides closed when triggered by a trip cord. Corral traps are large (0.25-4.00 ha) and can be permanent or portable constructions with hessian or shade cloth sides. The door is triggered either by remote device or trip wire, a one-way entrance can also be used. Drop net traps comprise a large square of nylon netting (0.1 m mesh) suspended on poles by a system of pulleys that release the net when a trigger mechanism is activated. Drop nets have not been widely used in Australia because of the largely forested habitats where deer are problematic.

Trapped animals can suffer from exposure, thirst, starvation, shock, capture myopathy, and predation; to avoid these impacts, traps should be placed in a suitable area protected from weather and inspected daily. Deer must have access to water and feed when held in large paddock traps for more than 24 hours. Trapped animals should be approached carefully and quietly to minimise panic, further stress, and risk of injury. Trapped deer should be euthanised as quickly and humanely as possible with a single rifle shot to the brain. If lactating females are caught in a trap, efforts should be made to find dependent fawns and kill them quickly and humanely. Non-target animals should be released at the trap site; if they are injured then veterinary treatment should be sought. Severely injured non-target animals must be destroyed quickly and humanely.

Exclusion fencing

Use of exclusion fencing is generally regarded as a humane, non-lethal alternative to lethal control methods. However, the high costs of establishing and maintaining deer-proof enclosures (including, if necessary, removal of deer from within the enclosure), mostly limits this technique to areas that have a significant and persistent deer problem or for the protection of small, valuable conservation areas or primary production assets. Although exclusion fencing acts as a barrier to deer it can have negative effects

on non-target species by altering dispersion and foraging patterns and causing entanglement and electrocution. It can also create a significant hazard to wildlife in the event of a bushfire (e.g., Long & Robley 2004). Refer to the following RSPCA website for further perspectives on the humaneness of exclusion fencing.

Lethal baiting

No pesticides are approved for use in the control of feral deer in Australia. Recent research in New Zealand and Australia has identified several potential bait presentation techniques that may have future application for deer management. Prior to any approval or adoption of baiting as an additional control method the technique would be required to demonstrate a high level of target selectivity, be matched with an approved toxicant, and produce consistent and humane results during approved field research trials.

Table 1 Humaneness, efficacy, cost-effectiveness, and target specificity of control methods

Method	Humaneness[1]	Efficacy	Cost-effectiveness	Specificity	Comments
Aerial shooting *Primary*	Acceptable Score: 4C (chest)	Effective	Relatively cost-effective. More cost-effective when deer density is high	Target specific	Suitable for extensive areas and inaccessible country. Most effective way of achieving quick, large-scale culling if appropriately resourced
Ground shooting *Primary*	Acceptable Score: 3A (head), 3D (chest)	Effective but only in low density areas	Relatively cost-effective at low densities	Target specific	Species differences in difficulty to locate and shoot. Labour intensive, only suitable for smaller scale operations
Exclusion fencing *Supplementary*	Acceptable Score: N/A	Limited	Expensive	Can be in certain situations	Useful for protection of threatened species or high value crops. Expensive, therefore can be impractical for broad scale application
Trapping (clover traps) *Supplementary*	Acceptable Score: N/A	Not effective	Not cost-effective.	May catch non-target animals	Variations in trap suitability between species. Not practical for large scale control but can be used to remove problem animals in peri-urban settings
Trapping (corral and paddock traps) *Supplementary*	Acceptable Score: N/A	Can be effective in certain situations	Can be cost-effective in certain situations	May catch non-target animals	Variations in trap suitability between species. Used to capture larger groups of animals
Lethal baiting *Not available*	Acceptable Score: N/A	Unknown	Unknown	Depends on agent used	No products currently registered

[1] Assessments conducted using a model to assess the relative humaneness of pest animal control methods (Sharp and Saunders 2011). Humaneness score (AB) consists of Part A - welfare impact prior to death, scale of 1 – 8, less suffering to more suffering and Part B - mode of death, scale of A – H, less suffering to more suffering. For assessment worksheets and matrix of relative humaneness scores see: https://pestsmart.org.au/toolkit-resource/feral-wild-deer-control-methods-humaneness-matrix/

Relevant legislation

All vertebrate pest controllers should familiarise themselves with relevant aspects of the appropriate federal and state legislation. The table below lists relevant legislation.

Table 2 Relevant legislation for all jurisdictions

Legislation	Intent relating to feral deer
Commonwealth	
Biosecurity Act 2015	Australian Pest Animal Strategy (2017- 2027) outlines principles for the management of pest animals https://www.agriculture.gov.au/pests-diseases-weeds/pest-animals-and-weeds
Environmental Protection and Biodiversity Conservation Act 1999	Deer species are included in the Key Threatening Process (KTP) for novel biota, which highlights a need to manage their impacts on biodiversity https://www.environment.gov.au/biodiversity/threatened/key-threatening-processes/novel-biota-impact-on-biodiversity
South Australia	
Landscape South Australia Act 2019 *Landscape South Australia Regulations 2020*	Declarations and control notices (under regulations) for feral deer specify it is an offence to release deer into the wild; fencing and tagging standards are required for keeping of domestic deer; and land managers are required to destroy all feral deer on their land https://www.pir.sa.gov.au/biosecurity/weeds_and_pest_animals/animal_pests_in_south_australia/established_pest_animals/feral_deer
New South Wales	
NSW Biosecurity Act 2015 *Biosecurity Regulation 2017*	Invasive species management is a shared responsibility for all community members. For feral deer, landowners (both private and public) are required to control feral deer to the extent necessary to minimise the risk of any negative impacts on their lands or that of their neighbours. Priority areas to reduce the impacts of feral deer are guided by the NSW Biosecurity Strategy 2013-2021 https://www.dpi.nsw.gov.au/biosecurity/managing-biosecurity/nsw-biosecurity-strategy-2021 and regional strategic pest animal management https://www.lls.nsw.gov.au/help-and-advice/pests,-weeds-and-diseases/pest-control/pest-species-control/wild-deer
Game and Feral Animal Control Act 2002	On specified public lands, deer may be hunted under a licence and with written permission issued by Department of Primary Industries NSW (via online booking system) Private land hunters, with permission to hunt from a landholder or occupier, do not require a game hunting licence, but do need a firearm licence (where firearms are used)
Threatened Species Conservation Act 1995	Feral deer (all species) are listed as a Key Threatening Process for herbivory and environmental degradation
Western Australia	
Agricultural and Related Resources Protection Act 1976	Requirements exist for the keeping of fallow and red deer https://www.agric.wa.gov.au/livestock-management/fallow-and-red-deer-keeping-requirements

Biosecurity and Agricultural Management Act 2007	Fallow, red deer (including wapiti and elk) and rusa deer are declared pests (s22). Fallow and red deer are classified as C3, requiring landholders control them and keeping them is restricted. Rusa deer are classified as C1 requiring them to be excluded, and they cannot be kept. Fallow and red deer (including wapiti and elk) may be kept with a permit. All other species are prohibited from being kept in Western Australia
Victoria	
Flora and Fauna Guarantee Act 1988	Sambar deer are listed as a Potentially Threatening Process for the reduction in biodiversity and survival of native plant taxa and ecological communities
Wildlife Act 1975	Hog, red, sambar, fallow, rusa, chital, sika and wapiti deer are defined as protected wildlife. Six species (hog, red, sambar, fallow, rusa, chital) are further declared game species for the purpose of the *Wildlife (Game) Regulations 2012.* Deer causing damage on public land can be destroyed under an Authority to Control Wildlife Permit. Deer (excluding hog deer) demonstrably causing damage on private property are subject to an 'unprotection order' and can be destroyed without a licence or permit in accordance with specified conditions
Wildlife (Game) Regulations 2012	Deer declared to be game can be hunted under a licence where harvest method is specified (e.g. firearms, hounds). Year-long hunting season and unrestricted bag limit for all game deer species, except hog deer (one month season, limit of one male and one female). Other restrictions may apply on public land
Catchment and Land Protection Act 1994	All deer except chital, hog, red, wapiti, sika, sika–red deer hybrids, fallow, rusa and sambar, are listed as prohibited pest animals
National Parks Act 1975	Exotic fauna (including deer) in National and State parks, Wilderness Parks, and other reserves, must be exterminated or controlled
Queensland	
Biosecurity Act 2014	Unless kept in a deer-proof enclosure, chital, fallow, red, rusa and hog deer are restricted invasive animals and are subject to control. They must not be, moved, fed, given away, sold, or released into the environment. All other deer species are prohibited matter subject to an eradication program if they are considered a significant biosecurity threat. It is an offence to deal with prohibited matter or fail to report its presence. Prohibited matter permits are available for a limited number of purposes. This Act requires everyone to take all reasonable and practical steps to minimise the risks associated with invasive plants and animals under their control (a general biosecurity obligation)
Australian Capital Territory	
Pest Plants and Animals Act 2005	*Cervus, Dama, Axis* and *Rusa* deer are listed as pests on the Pest Plants and Animals (Pest Animals) Declaration 2005 list No obligations exist for land managers to undertake control programs for feral deer
Nature Conservation Act 2014	No deer species can be kept as livestock without a licence
Tasmania	
Vermin Control Act 2000	A Wild Fallow Deer Management Plan for Tasmania highlights a need to minimise impacts of deer in areas with significant natural values and in peri-urban areas, as well as manage

	impacts of deer where distributions are growing. https://dpipwe.tas.gov.au/agriculture/game-services-tasmania/wild-fallow-deer-management-plan
Nature Conservation Act 2002	Feral deer are classified as Wildlife under the *Nature Conservation Act 2002* and partly protected wildlife under the *Wildlife (General) Regulations 2010*
Wildlife (General) Regulations 2010	Fallow deer may be hunted under a licence in specified autumn hunting season (1 month antlered males, 2 months antlerless deer). Each hunter has a bag limit of 1 male and 1 antlerless deer or 2 antlerless deer. First-year males are protected and cannot be taken. Only rifle hunting is permitted. A crop protection permit (CPP) is required for controlling problem deer (or any sex or age) on private land where commercial crops are produced. CPPs for adult male deer require a site visit by the State Department to assess damage to land. CPP are generally not issued for antlerless deer between November to March when females are pregnant or have dependent young
Northern Territory	
Territory Parks and Wildlife Conservation Act 2006	Feral deer are classified as a pest (feral – prohibited entrant)

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Standard Operating Procedure: Trial of aerial shooting of feral deer with advanced technology

Background

The SOP for a trial of aerial shooting of feral deer using advanced technology is required to increase the effectiveness of aerial controls for feral deer in South Australia. Use of the same approach and technology is currently being trialled by the ACT and Qld Governments and is routinely used in by the New Zealand Government and by contractors in NSW. Aerial programs for feral deer in some areas of SA, such as the Limestone Coast, have been conducted for 15 years, but the population has continued to increase dramatically. A new approach is needed. Advanced technologies provide new opportunities for lifting the effectiveness of control activities and improving animal welfare outcomes. This SOP covers the use of advances technologies in aerial control programs for feral deer, including

- Thermal assisted aerial culling (TAAC)
- Use of a second marksman
- Use of Clause 4(1)(a)

Thermal Assisted Aerial Culling (TAAC) incorporates thermal imaging equipment to increase detection of target species in difficult or densely vegetated environments. This tool will be most useful in inaccessible areas and to manage low-density populations or remove animals remaining in the areas following other control programs. TAAC takes advantage of the heat signature of the target species to detect them in the landscape. To allow this capability, a thermal camera operator (or thermographer) is included in the helicopter crew alongside a marksman Clause 4(1)(a)

The thermographer guides the shot of the marksman using a high-powered laser. The marksman is also equipped with thermal optics allowing engagement of targets normally invisible to the naked eye. In this way, TAAC increases detection of target species. Teams involved in shooting in TAAC programs vary among jurisdictions. In South Australia, a formation comprising a pilot, two marksmen, and camera operator is being trialled (Figure 1).

A second marksman was identified as a means for increasing the efficiency of the operations. Clause 4(1)(a) Clause 4(1)(a)

Recent trials by the NZ, ACT and Qld Governments and by contractors in NSW demonstrates good animal welfare outcomes for feral goats (Sharp & Trudy 2005) and fallow deer (i.e., Hampton *et al.* 2022) targeted with Clause 4(1)(a) in aerial programs. Fallow deer are the key target species for controls in SA. Having two marksmen and more firearm options provides more opportunities for responding to conditions and increasing efficiencies. A trial by PIRSA in South Australia found that the number of feral deer controlled increased from 15 per hour with one marksman to 50 per hour with two.

This standard operating procedure (SOP) is a guide for a trial of advanced technology in aerial culling programs. It does not replace or override the legislation that applies in relevant state or territory jurisdictions. The SOP should only be used subject to applicable legal requirements.

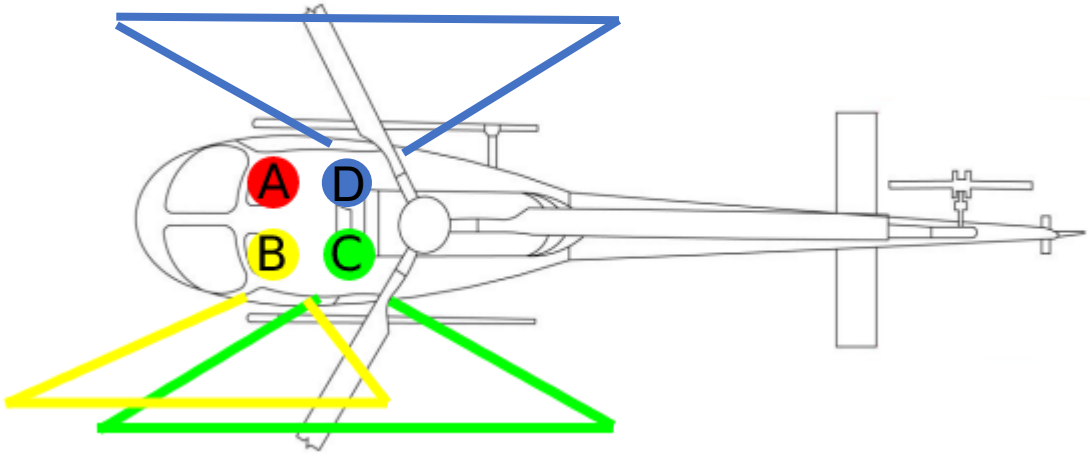


Figure 1 Helicopter layout for TAAC, Pilot (A), Marksman with Clause 4(1)(a) (B), Camera operator (C), Marksman with Clause 4(1)(a) (D). Yellow and blue shape indicate the field of view for the marksmen while the green shape shows field of view for the camera operator. Sometimes the firearms will be swapped between the positions shown for the marksmen in B and D.

Application of TAAC

- TAAC should be used in a strategic manner as part of a coordinated program designed to achieve sustained effective control
- TAAC can be used in a wide range of settings, including for knockdown in densely vegetated areas, mop up in low density pest areas, or for quick response to incursions
- TAAC programs in SA are typically planned between agencies including PIRSA, the landscape boards, and the National Parks & Wildlife Service. In the trial proposed in October 2022, the latter is not involved.
- Multiple aerial shooting programs over one area can be more effective than a single program
- All aerial shooting programs must comply with relevant federal and state legislation, policy, and guidelines
- Helicopter pilots must hold the appropriate licenses and permits and be experienced in aerial shooting operations
- Helicopter operators must have approval from the Civil Aviation Safety Authority to undertake aerial shooting operations and flying at low levels
- Shooting of feral animals will only be performed by competent, trained aerial marksmen who have been accredited for the task and who hold the appropriate licenses (e.g., Firearms licence with Category D endorsement, and aerial shooting)
- Marksmen should be well versed and competent at shooting with thermal optics as well as understand TAAC method
- Two marksmen should work in tandem to maximise the efficiency of the program
- Storage use and transportation of firearms and ammunition must comply with the relevant legislative requirements and departmental policy
- For safety reasons, shooting from a helicopter cannot be undertaken in adverse weather conditions (e.g., strong wind, rain, low cloud)
- For the thermal equipment to work effectively, the heat signature of the target animals must be significantly different to the temperature of the surrounding environment. As such, the best time of day for TAAC is early dawn and dusk, and the optimal time of year for TAAC is during winter to ensure maximum thermal effectiveness. During cool, overcast weather conditions TAAC can operate during the entire day

Animal Welfare Considerations

Impact on feral deer

- Aerial shooting can be conducted with a high level of humaneness with the right skill and judgement of the shooter and camera operator
- Shooting must be conducted in a manner which maximises its effect, causing rapid death. This outcome requires appropriate use of firearms and ammunition
- Only head (brain) or chest (heart-lung) shots are to be used.
- A chest shot causes massive tissue damage and death from haemorrhaging of major blood vessels. If the shot stops the heart functioning, the animal will rapidly lose consciousness. Correctly placed head shots cause brain functions to cease, and insensibility will be immediate.
- A target animal is only shot when:
    - it is clearly visible and recognised
    - it is within effective range of shooter and the firearm and ammunition being used
    - a humane kill is probable. If in doubt do NOT shoot
- The pilot must offer the shooter the best opportunities for a humane kill. This support includes maintaining a stable shooting platform and ensuring the helicopter is aligned so that the shooter can maintain accuracy and to avoid non-lethal shots (e.g., to the spine or neck)
- If an animal is wounded, prompt follow-up procedures must follow to ensure it is killed quickly and humanely. This follow-up is achieved by:
    - the thermal camera operator tracking wounded or stray targets, ensuring none remain
    - using a deliberate ‘overkill’ policy where multiple, accurately placed shots are used per animal, instead of a single shot
- As part of the overkill policy, each deer shot with a Clause 4(1)(a) also receives a Clause 4(1)(a) shot to the chest
- All animals are shot at least twice, with at least one shot placed in the heart/lung, before shooting further animals.
- Each shot animal must be considered dead by the shooter and the pilot or camera operator, and verbally announced as a ‘kill’ before shooting further animals.
- The cost of ammunition, number of shots fired, and extra flying time must not deter shooters from applying the appropriate follow-up procedures
- Aerial shooting should not be carried out if the nature of the terrain reduces accuracy resulting in too many wounding shots and prevents the humane and prompt despatch of wounded animals
- Where target animals are encountered in a group using thermal equipment, the smallest group that separates from the mob should be targeted first, because the ability to reacquire the larger mob later is easier with the thermal equipment, and the deer are likely to stay mobbed in larger groups
- Thermal binoculars or cameras assist with confirming insensibility and shot placement after an animal has collapsed
- To minimise the animal welfare implications of leaving dependent fawns to die, where possible they should be targeted first
- If lactating females are shot, reasonable efforts should be made to find dependent young and kill them quickly and humanely
- Aerial shooting programs by their nature must be highly accountable. Apart from maintaining absolute animal welfare standards, records should be kept of number and location of animals killed, hours flown, ammunition used and fly-back procedures

Impact on non-targeted animals

- Shooting is target specific and does not usually impact other species. However, a risk of injuring or killing non-target animals, including livestock, may occur if shots are taken before an animal has been positively identified
    - Confirmation of target species must occur between at least two members of the flight crew, usually the camera operator and marksman, before engaging the target
- Sensitive livestock such as horses and pets may be frightened by gunshots, helicopter rotor noise, and wind blasts from the helicopter. These animals may injure themselves by running into fences or other obstacles. Pest programs should avoid shooting in areas where livestock occurs or organise their removal from the area prior to the shooting program
- TAAC sometimes reduces the impact on non-target animals compared to normal aerial culling programs because the helicopter travels at a higher altitude when searching for targets. The thermal equipment enables greater detectability of animals, reducing pressure on non-target wildlife and livestock

Health and Safety Concerns

- The potentially hazardous nature of aerial shooting requires safety protocols to be followed. Each team member must be aware of, trained, and briefed on helicopter and firearm safety
- The helicopter pilot must give a thorough pre-flight briefing to all personnel to establish communication protocols among all involved, including pre-shot manoeuvres, commands for firing and emergency procedures
- Shooting from a helicopter can be hazardous, particularly in areas of rugged topography. The combination of low-level flight, proximity to obstacles (trees, rocks, wires), and use of firearms makes this activity high-risk. The risks are mitigated through:
    - an Aerial Shooting Operations Plan being developed and approved by the agencies involved
    - appropriate training and experience of all personnel (helicopter crew and marksman)
    - approval from landholders to undertake the culling on their property, reminders to landholders of when the culling will take place and notifying neighbours
    - appropriate mapping and crew briefings conducted by the project manager and pilot
    - operations reviewed and risk assessment undertaken
    - clear communication among all on-board staff
    - daily review of operations
- It is essential that ejected ammunition cases do not interfere with the safe operation of the helicopter. Some jurisdictions require fitting of a deflector plate to the firearm to ensure shells are ejected safely
- Firearm users must strictly observe all relevant safety guidelines relating to firearm ownership, possession, and use
- When not in use, firearms must be securely stored in a compartment that meets state legal requirements. Ammunition must be stored in a locked container separate from firearms
- Firearms not loaded until the helicopter is in the air and approval is given by the pilot; the breach is always empty; only loads a shell when trigger pulled
- Clause 4(1)(a)
- Adequate hearing protection should be worn by the shooter and others in the immediate vicinity of the shooter. Repeated exposure to firearm noise can cause irreversible hearing damage
- Safety glasses are recommended to protect the eyes from gases, metal fragments and other particles

Equipment Required

The following specialised equipment is required for conducting TAAC operations. This equipment is non-standard for conventional aerial culling. This list only includes equipment critical to TAAC, it does not include all equipment required for regular aerial shooting operations.

Firearms and ammunition

- Clause 4(1)(a)
- Specifying ammunition based on species alone rather than individual body mass is problematic. Shooters should select ammunition (from those specified) that best suits their situation, and which is justifiable on animal welfare grounds. This approach will apply to situations where multiple species are being controlled in one operation
- To provide a backup in case of firearm/ammunition malfunction, additional firearms may be carried by each shooter
- The accuracy and precision of firearms should be tested against inanimate targets before any shooting operation

Firearms should be:

- Reliable, well maintained, and capable of good accuracy
- Clause 4(1)(a)

Clause 4(1)(a)

Clause 4(1)(a)

Clause 4(1)(a)

Clause 4(1)(a)

Aircraft

- Aircraft used for aerial shooting should be manoeuvrable, fast, and responsive to allow quick follow-up of any wounded animals; it should also be stable for accurate shooting
- GPS (global positioning systems) and computer mapping equipment with appropriate software must be used to assist in the accurate recording of information (e.g., where animals are shot, flight heights) and to eliminate the risk of shooting in off-target areas

Other equipment

- Flight helmet (with intercom)
- Fire-resistant flight suit
- Safety harness
- Other personal protective equipment including lace-up boots, gloves and appropriate eye and hearing protection
- Survival kit (including a first aid kit)
- Emergency locating beacon
- Lockable firearm box
- Lockable ammunition box
- TAAC-specific equipment is listed in Table 5

Table 5 Equipment required for TAAC

Equipment Type	Specs and reason for Equipment
Firearm mountable thermal scope	A high quality, high refresh rate dedicated thermal scope must be attached to the firearm
High-quality thermal binoculars with on-body storage	High quality thermal binoculars with appropriate tether should be available

Weather Conditions

- TAAC can only occur under certain weather conditions for crew safety, effective aerial shooting, and thermal conditions
- Before any take off weather conditions need to be checked. Weather is taken from the closest weather station to the intended working area
- If weather exceeds the parameters in Table 6 the operation is not to proceed

Table 6 Weather parameters required for TAAC operation commencement

Weather condition	Working parameters	Monitored by
Wind	Up to 30knots (consistent) Up to 15-20knots if frequent gusts	Pilot - In consultation with marksman, as it cannot compromise animal welfare outcomes
Rainfall	Cannot be undertaken in rain	Pilot - In consultation with crew
Cloud/fog	Determined by CASA regulations	Pilot - In consultation with crew
Thermal	Thermal clarity decreases with increased temperatures and bright sunlight. If thermal clarity declines such that kangaroos and other abundant species cannot be clearly identified, it is assumed target species cannot be detected and operation is to cease	Thermal Camera Operator - In consultation with marksman

Procedures

Pre-flight procedures

Pre-flight check – Marksmen

- Thermal equipment is functioning, lens cleaned, batteries charged, and spares packed
- Binoculars are tethered to marksman or helicopter
- Firearms and loaded magazines placed in helicopter:
    - Firearms are clear and checked by pilot before approaching or loading onto aircraft
    - Secondary firearms clear and checked by pilot before approaching or loading onto aircraft
- If being worn – electronic thermal clothing is working correctly
- Communications check with flight crew
- Check functionality and accuracy of mapping and iPad
- Check that harness is comfortable and fitted

Pre-Flight check – Camera Operator

- Thermal equipment is functioning, lens cleaned and correctly connected to helicopter
- Harness and ezy-rig are comfortable and fitted
- Communications check with flight crew

Pre-flight check – Pilot

- Pre-flight machine check
- Check communications with flight crew
- Check communication devices are functioning correctly and charging
- Check operation map is up to date and working correctly

In-flight Procedures

Detection phase

- Camera operator and marksmen scanning area searching for heat signatures of feral deer
- If camera operator makes a detection, the laser is engaged, and a marksman investigates target with thermal binoculars. Target is either confirmed as feral deer or pilot is directed to the area for further investigation
- Confirmation of feral deer detection is achieved once camera operator and a marksman verbally confirm investigated subject is a feral deer(s)
- Pilot/camera operator notes feral deer location and observes surrounding area for hazards
- Pilot keeps aircraft position maximum effective range from deer to minimize target pressure:
    - Camera operator continues to monitor and track target location

Transition phase

- Pilot records feral deer detection in mapping software:
    - The quantity and age of feral deer are recorded
- The pilot checks the map to confirm feral deer are in approved control area (may also be checked by marksmen), pilot gives verbal confirmation that a marksman is clear to engage
- Marksmen transitions from detection to control phase
    - Thermal binoculars are securely stored
    - Firearm is selected

Control phase

- Camera operator and marksmen direct pilot for best angle of approach
- Maximum distance to effectively dispatch from target is maintained by pilot and direction by camera operator and marksmen:
    - Reducing pressure applied on target causes feral deer to not flee, making shots potentially easier, and reducing the chance of target pests scattering and being lost
- Targets should not be pushed into clearer terrain. Allowing reliance on the thermal equipment to direct shooting efforts through light foliage:
    - If feral deer are detected in extremely thick or tall timber making engagement difficult pressure can be applied to move feral deer into more suitable terrain
    - Once feral deer are in suitable terrain pressure is backed off by pilot to allow target to 'settle'
- A slow approach is taken when minimal pressure is applied as camera operator can track feral deer to ensure they are not lost
- Camera operator counts and reports number of feral deer controlled in group
- Marksmen dispatch detected feral deer, with an 'overkill' policy to ensure animals are dead

Re-acquire phase

- Under circumstances where an individual or mob has been lost during the dispatchment phase the camera operator verbally announces target has been lost
- Pilot engages a 'snail' manoeuvre and rotates around last detection area in an outwards spiral
- If feral deer are not detected, the pilot notes the area on the mapping software and the operation moves on from the area:
    - Putting excessive pressure on the area can result in educating feral deer of control technique as well as further disperse feral deer from the area, making detection more difficult in the future
- Best course of action is to return to the area in the following evening or next day. Once feral deer have settled

Cease of operation

- The flight crew will discuss operational conditions and issues, under normal conditions four factors can cause the operation to stop.
    - End of fuel time (AS350 Eurocopter approximately 3 hours)
    - Poor thermal conditions (once camera operator losses thermal clarity)
    - Poor weather conditions (determined by pilot under direction from Table 6)
    - Malfunction of firearms, essential equipment, or aircraft

Target animal and shot placement

Aiming points for head and chest shots are as follows (See also Figure 2)

Chest Shot

Side view

The firearm is aimed at the centre of a line encircling the minimum girth of the animal's chest, immediately behind the forelegs. The shot should be taken slightly to the rear of the shoulder blade (scapula). This angle is taken because the scapula and humerus provide partial protection of the heart from a direct side-on shot.

Head Shots

Poll position (rear view)

When aerial shooting, most head shots will be taken at this position as animals are running away from the helicopter. The firearm should be aimed at the back of the head at a point between the base of the ears and directed towards the mouth.

Temporal position (side view)

This shot is occasionally used where a second shot needs to be delivered to an injured animal that is lying on its side. The deer is shot from the side so that the bullet enters the skull at a point midway between the eye and the base of the ear.

Frontal position (front view)

This position is occasionally used when an animal faces the shooter. It should not be used for larger adult deer due to the heavier bone structure of the front of the skull. The shot is directed at a point of intersection of lines taken from the base of each ear to the opposite eye.

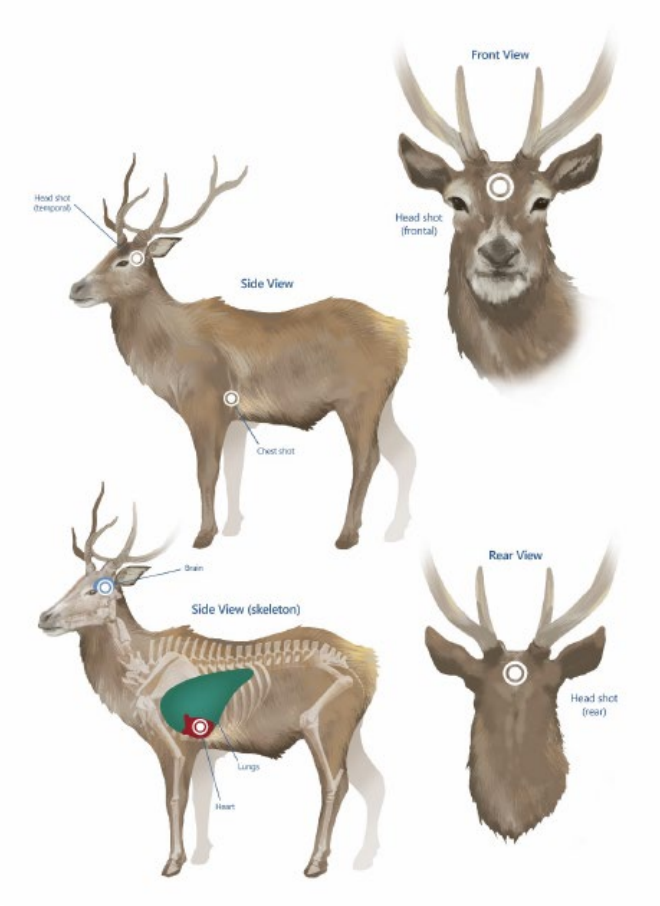


Figure 2 Shot placement for aerial shooting of deer.

Note that shooting an animal from above or below the horizontal level as depicted here will influence the direction of the bullet through the body. Adjustment to the point of aim on the external surface of the body may need to be made to ensure that the angled bullet path causes extensive (and therefore fatal) damage to the main organs in the target areas.

Post-flight procedure

End of flight check

- Firearms are unloaded, cleared, and checked with the pilot before departing the aircraft
- Thermal equipment is turned off and batteries placed on charger for next operation
- Scopes are cleaned
- Firearms are inspected to ensure no faults have occurred during operation
    - Firearms are cleaned if required
- Magazines are correctly and securely stored along with firearms
- Data recordings are checked and confirmed

Dynamic Risk Assessment

PIRSAFE WHS Safe Operating Procedures (SOP)

SOP title: Aerial culling feral deer with advanced technology .....

Risk assessment Objective Reference No: A5637541 .....

Division: Biosecurity .....

Site/workgroup: Invasive Species Unit .....

Task description: **using TAAC, shotgun, and second marksman in aerial culling of feral deer** .....

Associated job roles: State Feral Deer Coordinator .....

Recorded in Divisional Job Task Risk Register ❑

Recorded in Divisional WHS Training Needs Analysis (Objective Reference) ❑

SOP number: <insert ref. no. from local business division and/or workgroup/site *PIRSA WHS Document Control Register HR OHS&W F 001*>

Date of last revision: 30/09/22

Date for review: 30/09/23

Developed by (author/s): Annette Scanlon .....

Approved by: Brad Page, Chair, Waite Site WHS Committee

Reviewed by: Kate Fielder; Shannon Robertson, Members, Waite Site WHS Committee

Recorded training in *PIRSA WHS Safe Operating Procedures (SOPs) Sign Off Sheet* or *PIRSA OurDevelopment System*) ❑

ITEM NO	SEQUENCE OF JOB STEPS List the steps required to perform the task in the order they are carried out	POTENTIAL HAZARDS/RISKS OF EACH STEP Against each step list the hazards/ risks that could cause injury or damage to equipment or the environment	STANDARD OPERATING PROCEDURE How to do it	PROTECTIVE EQUIPMENT Please specify (refer below)
1.	**TAAC – use of thermal camera to detect and monitor feral pest species**	**Equipment failure, loss of time and resources**	• All equipment checked prior to flight • Cease of operation protocols includes for malfunction of essential equipment • All flight crew are licensed, skilled, and experienced	**3,4,5,6,7,11,13**
2.	**Second marksman with** Clause 4(1)(a) **to participate in culling activities**	**Complex communication environment could lead to confusion**	**Pre-flight check by pilot to cover:** • Pre-flight machine check	**13**

		and two shooters targeting the same animal, or both not shooting	• Check communications with flight crew • Check communication devices are functioning correctly and charging **In-flight protocols:** • pilot gives verbal confirmation to marksman to engage the target	
3.	**Use of** Clause 4(1)(a)	Clause 4(1)(a) **could deliver non-lethal shot to deer**	• Clause 4(1)(a) only used in 20-30 m range from target; not used on larger deer species (samba or rusa) • An overkill policy requires each deer shot with a Clause 4(1)(a) to also receive a Clause 4(1)(a) to the chest • The thermal camera enables confirmation of kill	**13**

Eye Protection	Breathing Protection	Head Protection	Hearing Protection	Hand Protection	Foot Protection	Protective Clothing	Face Protection	High Visibility	Dust Mask	Safety Harness	Life Jacket	Comply with Site Safety Rules
1	2	3	4	5	6	7	8	**9**	10	11	12	13
												

Department of Primary Industries and Regions (PIRSA)

Thermal Assisted Aerial Cull (TAAC)

AERIAL OPERATIONS PLAN

LIMESTONE COAST, 20 MARCH – 6 APRIL 2023

Recommendation / endorsement / approval

For approvals required for changes mid-operation, refer to mid-operation approvals table (page 10)

Prepared by	Signature	Recommended / not Recommended	Date
Clauses 4(1)(a), 6(1) Clauses 4(1)(a), 6(1) PIRSA Biosecurity			
Endorsed by	**Signature**	**Endorsed / not Endorsed**	**Date**
Clauses 4(1)(a), 6(1) A/GM, Invasive Species Unit PIRSA Biosecurity			
Approved by	**Signature**	**Approved / not Approved**	**Date**
Nathan Rhodes (Project Sponsor) Executive Director PIRSA Biosecurity			

Limestone Coast Landscape Board Approval:

Endorsed by	Signature	Endorsed / not Endorsed	Date
Clauses 4(1)(a), 6(1) General Manager Limestone Coast Landscape Board			

Forestry SA Approval:

Endorsed by	Signature	Endorsed / not Endorsed	Date
Julian Speed Chief Executive Forestry SA			

National Parks and Wildlife Service / Department for Environment and Water endorsement*:

Endorsed by	Signature	Endorsed / not Endorsed	Date
Clauses 4(1)(a), 6(1) Director, Regional Operations National Parks and Wildlife Service			

*Noting that operations over DEW managed lands and involvement of DEW Aerial Marksman Team are managed under a separately approved plan (Attachment R), and that when applicable DEW will be the responsible aerial shooting organisation, as required by the CASA Manual of Standards Part 138.

Project objective and description

The objective of this project is to implement a thermal assisted aerial cull (TAAC) to support localised eradication of feral deer in the Limestone Coast region.

Feral deer are pest animals declared under the *Landscape South Australia Act 2019* for destruction across the state. It is the landowner's responsibility to destroy all feral deer on their property. Landowners include private individuals, Government agencies, conservation agencies, and forestry groups. To assist landowners in meeting their obligations, PIRSA periodically conducts aerial culling operations in partnership with the SA landscape boards and these other Government agencies.

For further information and a detailed description of the TAAC method being employed in this operation, refer to the **National SOP for aerial shooting of feral deer** (Attachment B)**.**

Operations overview

Project Manager	Clauses 4(1)(a), 6(1) Clauses 4(1)(a), 6(1) (PIRSA) – Clause 4(1)(a), 6(1)
Project Officers	Clauses 4(1)(a), 6(1) Operations Manager (LCLB) – Clauses 4(1)(a), 6(1) Clauses 4(1)(a), 6(1) Clauses 4(1)(a), 6(1) (LCLB) – Clauses 4(1)(a), 6(1) Clauses 4(1)(a), 6(1) Senior Landscape Officer (LCLB) – Clauses 4(1)(a), 6(1)
Date of operations	20 March – 6 April 2023
Control area	This plan concerns **Sessions 1, 3** and **4** of a broader aerial control plan being coordinated on the Limestone Coast region, in collaboration with the Limestone Coast Landscape Board. A concurrent session (Session 2) is the subject of a separate operations plan. The control areas include: ○ **Session 1 (Mon 20 Mar to Sun 26 Mar)**: forestry and adjoining private land around the Wattle Range and Penola areas, including parks and native forest reserves. ○ **Session 3 (Mon 27 Mar to Fri 31 Mar)**: forestry and adjoining private land around Mount Gambier, including parks and native forest reserves. DEW lands are not included in this session. ○ **Session 4 (Sat 1 to Thur 6 Apr)**: Duck Island / Willoway / Glenstrae / thick vegetated private properties and parks in the Gum Lagoon area.
Operations base and Accommodation	Session 1 and 3: Clause 4(1)(a) Session 4: Clause 4(1)(a)
Target species	All species of feral deer (fallow, red, sambar, chital, rusa, hog)
	Excluded species: all other species
Aerial operator	Heli Surveys Pty Ltd
Aircraft	B2 Squirrel
Chief pilot	Clauses 4(1)(a), 6(1) (Heli Surveys) – Clauses 4(1)(a), 6(1)
Thermographer	Clauses 4(1)(a), 6(1) (Heli Surveys) – Clauses 4(1)(a), 6(1)
Chief marksman	Clauses 4(1)(a), 6(1) (Wildlife Resources Australia) – Clauses 4(1)(a), 6(1)
Second marksman	Clauses 4(1)(a), 6(1) (Wildlife Resources Australia) – Clauses 4(1)(a), 6(1)
Third marksman	Clauses 4(1)(a), 6(1) (Wildlife Resources Australia) – Clauses 4(1)(a), 6(1)
Fourth marksman	Clauses 4(1)(a), 6(1) (DEW AMT)* – Clauses 4(1)(a), 6(1) Clauses 4(1)(a), 6(1) (DEW AMT)* – Clauses 4(1)(a), 6(1) *Only on flights Involving DEW reserves, subject to separate approval (Attachment R)

This plan addresses all operational aspects for aerial culling taking place over private land and Forestry SA properties in the operations area. For all matters relating to operations occurring over these estates (85% of the operations area), refer to this plan. The Department for Environment and Water (DEW) has a separate approval process and requirements for the involvement of DEW land (15% of the operations area) and for engaging/ for use of the DEW Aerial Marksmen Team.

For all operations involving DEW lands or personnel, refer the DEW Aerial Shooting Operations Plan **(Attachment R).** When the DEW plan is in effect, DEW is the responsible aerial shooting organisation as required by the CASA Manual of Standards Part 138**.** At all other times, PIRSA is the responsible aerial shooting organisation.

Contents

Legislative requirements

The table below outlines the legislation relevant to operating an aerial cull program in South Australia. It is included to assist planning and requires critical considerations to be checked off with the flight team prior to commencement of operation (i.e., in a pre-flight briefing). When conducting aerial culling operations, the Supplier and project staff must comply with the requirements of the following:

Legislation*	**Comment** ***(points are not the exhaustive requirements under each legislation but refer to critical considerations)*** *identify important clauses of legislation, e.g. licences and permits, notifications, policies and procedures, etc.*	**Tick to acknowledge compliance** (During Pre-Flight Briefing)
Airspace Act 2007	• As required by the Civil Aviation Safety Authority (CASA) • Fly neighbourly advice	
Animal Welfare Act 1985	• **Refer to National COP and SOP** • Animals must be killed as quickly as possible, achieved through appropriate shot placement • A minimum of two shots are used per animal – initial head/chest shot followed by a second chest shot • Two members of crew (In TAAC, usually marksman and thermal camera operator) to verbally confirm animal is dead before the animal is left • If an animal is wounded by the initial shot, additional shots are required to confirm death. Any wounded animal is to be killed before new animals are targeted • If an animal is wounded inside the operational zone and moved onto an unapproved property, the animal must be pursued (where safe to do so)	
Civil Aviation Act 1988 and Part 138 (Aerial Work Operations) – Manual of Standards 2020	• As required by the Civil Aviation Safety Authority (CASA) • Aircraft must be appropriate for operations • Approval to fly with doors open/removed • Approval to fly with firearm • Approval for low-level flying • Buffer zones must be adhered to (see below) • Aerial Shooting Plan and Aerial Shooting Safety Management Plan must be in place	
Criminal Law Consolidation Act 1935	• Unlawful discharge of a firearm	
Firearms Act 2015	• Appropriate firearms and ammunition to be used • Firearms must be registered • Marksmen must be licenced and trained • Firearms and ammunition must be securely stored when not in use • Sound moderators may be used with pre-operation communication to SAPOL • Landholders consent to shoot on property	

Forestry Act 1950	• Closure of forestry land (If applicable)	
Landscape South Australia Act 2019	• Permit/approval to control pest animal • Approval to access land	
National Parks and Wildlife Act 1972	• Closure of parks	
Work Health and Safety Act 2012	• Suppliers/aerial operator must have their own WHS processes, policies and procedures that ensure compliance with the legislation, or adopt relevant PIRSA processes, policies and procedures	

* Includes all subordinate legislative instruments, such as Regulations, Orders and Notices.

Operations

Operations team	
Project Manager	Clauses 4(1)(a), 6(1) (Session 4), Clauses 4(1)(a), 6(1) PIRSA – Clauses 4(1)(a), 6(1) **On-site operations coordinator for 20-23 March & 1-6 April** • To coordinate on site operations as outlined in this document. • Responsible for all duties and decision making required by the Project Manager, as outlined in this document.
Project Officer	Clauses 4(1)(a), 6(1) (Session 1), Operations Manager, LCLB – Clauses 4(1)(a), 6(1) • To coordinate and support of Limestone Coast Landscape Board staff and project officers.
Project Officer	Clauses 4(1)(a), 6(1) (Session 1), Clauses 4(1)(a), 6(1) LCLB – Clauses 4(1)(a), 6(1) **On-site operations coordinator for 23-26 March** • To coordinate on site operations as outlined in this document.
Project Officer	Clauses 4(1)(a), 6(1) (Session 3), Senior Landscape Officer, LCLB – Clauses 4(1)(a), 6(1) **On-site operations coordinator for 27-31 March** • To coordinate on site operations as outlined in this document.
Summarised aircraft personnel	**1 pilot, 4 aerial marksmen*, 1 camera operator** **Only 1-2 marksmen at any time onboard aircraft, allowing for rotation of crew*
Pilot	Clauses 4(1)(a), 6(1) (Heli Surveys) – Clauses 4(1)(a), 6(1)
Marksmen	• Chief Marksman, Clauses 4(1)(a), 6(1) (Wildlife Resources Australia) **Session 1 and 3 (20 March – 1 April)** • Clauses 4(1)(a), 6(1) (Wildlife Resources Australia) **Session 1, 3 and 4 (20 March – 6 April)** • Clauses 4(1)(a), 6(1) (Wildlife Resources Australia) **Session 3 and 4 (27 March – 6 April)** • Clauses 4(1)(a), 6(1) (DEW AMT) **Session 1 (23 March – 26 March only)*** • Clauses 4(1)(a), 6(1) (DEW AMT) **Session 4 (1-3 April only)*** ***DEW AMT are involved on trial/training basis for flights including parks only (Attachment R). When the DEW AMT are present and operating in the program, DEW are the responsible aerial shooting organisation.**
Thermal camera operator(s)	Clauses 4(1)(a), 6(1) (Heli Surveys)

Aerial culling methodology	
Crew configuration	Both single shooter and two shooter crew configurations will be used during the duration of this Thermal Assisted Aerial Culling Operation For detailed description of single shooter and two shooter TAAC formations: • Safe Work Methods Statement (SWMS) - Heli Surveys Thermally Assisted Aerial Culling – Version 4 (Attachment F) • Safe Work Methods Statement (SWMS) – Two Shooter TAAC Operations (Attachment G)
Firearms used As per National SOP (Attachment B)	**Wildlife Resources Australia:** Clause 4(1)(a) Clause 4(1)(a) Wildlife Resources Australia personnel to follow Firearms Go/No-Go Checklist (Attachment K). The sound moderator only to be used by appropriately authorised and permitted members of the marksman team. **DEW Aerial Marksman Team:** Clause 4(1)(a) Clause 4(1)(a) For more details about DEW Aerial Marksman Team equipment and firearms use, see Attachment R.

Pre-operation briefing and post-operation debrief

A pre-operation briefing (Attachment M) will be conducted by the Project Manager or an appropriate Project Officer to induct all project staff and contractors to the operation, familiarise all operations team members with the approved operations plan, and clearly set out roles and responsibilities of each member of the operations team.

After the last flight of the operation, a post operation de-brief (Attachment N) will also be conducted to reflect on and review aspects of project preparation and implementation, so that continual learning and improvements for operations are ongoing.

Operation zones, buffer zones, and exclusion zones

Shooting can only occur in the identified operation zones. These zones will be outlined at briefings and illustrated on operation maps and maintained by the pilot. Exclusion zones, buffer zones, known hazards and recreation sites will be clearly marked on operational maps.

Areas that the aircraft cannot fly into at low altitude are called exclusion zones. Areas that the aircraft can fly into at low altitude, but no shooting is permitted, are called buffer zones. Exclusion zones and buffer zones may be identified to avoid flying or shooting over landholders who have not provided consent for either or both activities, or around hazards such as powerlines and towers, or areas associated with an identified feature. Commonly used buffer zone distances include:

- 500 metres either side of a major public road
- 150 metres either side of a minor public road
- 300-500 metres in any direction from housing (this may be reduced with landholder's written permission)

- 100 metres from the operation zone boundary
- 250 metres in any direction from any vehicle
- 250 metres in any direction of a person on private land in or near a vehicle

Other distances for buffer zones may be applied in different projects and locations. Buffer distances for this operation have been determined by the Project Manager and Project Officers prior to the operation and are marked on the operational maps.

Shooting must not occur in any exclusion zone. CASA regulations stipulate that shooting can never take place within 300 metres of the dwelling of someone who objects to the aerial shooting operation.

A reconnaissance flight may be undertaken prior to the operation to confirm the location of exclusion zones and known hazards. Any request to access an exclusion zone will require approval from the Project Manager.

Aircraft operations must also prevent stress to livestock. Some landholders will advise of exclusion zones in the planning stage, but the aircraft pilot must always fly to prevent stress to livestock on any property.

If a person is identified on foot in private scrub, all operations in the immediate vicinity are to cease until the area is cleared.

The aircraft can land on any property if an emergency landing is required.

All relevant policies, procedures, guidelines, standards etc. are listed in Appendix B.

Site clearance and closures

The following non-private sites and roads have been closed for the operation:

Agency	Site	Dates closed	Public notification and closure activities	Responsible person(s)
Department for Environment and Water / National Parks and Wildlife (Approvals for shooting on DEW properties are in subordinate plan, Attachment R)	**Session 1** - Big Heath CP - Glenroy CP - Mary Seymour CP - Penola CP - Calectasia CP - Telford Scrub CP - Gower CP - Furner CP **Session 4** - Gum Lagoon CP - Tilley Swamp CP - Jip Jip CP - Hansons Scrub CP - Martin Washpool CP - Bunbury CP - Messent CP	Monday 20 March to Sunday 26 March 2023 Saturday 1 April to Thursday 6 April	- Park Alert placed on DEW website by 3 March - Gate closures and signage in place at all parks - See below table where physical presence is required to prevent public access - Closures will be managed by NPWS staff (See Attachment R)	Clauses 4(1)(a), 6(1)
Forestry SA	**Session 1 & 3** - Boolara NFR - Burr Slopes NFR - Claypans CA - Comaum NFR - Deadmans Swamp NFR - Gillap South NFR - Glencoe Hill NFR	Monday 20 March to Friday 31 March 2023	- Alert placed on website and social media in advance of shoots - Gate closures and signage installed at key locations (targeting main roadsides and gates) – Clause 4(1)(a), Clause 4(1)(a)	Clauses 4(1)(a), 6(1) - alerts Clauses 4(1)(a), 6(1) 4(1)(a), 6(1) Clauses 4(1)(a), 6(1), Clauses 4(1)(a), 6(1) Clauses 4(1)(a), 6(1) - signs

	- Grundy Lane NFR - Hacket Hill NFR - Honan NFR - Horseshoe CA - Island Swamp NFR - Kangaroo Flat NFR - Kay NFR - Kennion NFR - Khayyam CA - Konetta NF - Long NFR - Malone Heath NFR - McRosties NFR - Mount McIntyre NFR - Mount Watch NFR - Mt Lyon CA - Muddy Flat NFR - Nangwarry NFR - Native Wells NFR - Overland Track NFR - Rock Shelter NFR - Rocky Reserve NFR - Round Waterhole NFR - The Bluff NFR - The Heath NFR - The Marshes NFR - The Woolwash NFR - Topperwein NFR - Wandilo NFR - Whennen NFR - White Waterhole NFR - Windy Hill NFR - Wombat Flat NFR - Windy Hill NFR		Clauses 4(1)(a), 6(1) - See below table of locations where physical presence is required to prevent public access	

The following gates or roads will be closed and patrolled, where resources allow, to prevent public access:

Site (general location)	Gate or road (specific location)	Dates closed (or during flight #)	Assigned person(s)*	Responsible agency
Clause 4(1)(a)	Clause 4(1)(a)	20 March – 31 March	On duty Project Officer to delegate from gate roster during flights covering this area	Limestone Coast Landscape Board / PIRSA
Clause 4(1)(a)	Clause 4(1)(a)	20 March – 31 March	On duty Project Officer to delegate from gate roster during flights covering this officer	Limestone Coast Landscape Board / PIRSA

* Personnel must wear hi-vis clothing and have a communication device and follow SOP for gate patrols/closures.

Communications

All relevant personnel, i.e. those listed in this operations plan, must adhere to communication requirements required by law and by the Project Manager. All personnel must familiarise themselves with the appropriate communication device prior to operations commencing.

Scheduled calls

Scheduled calls are to be made between the Chief Pilot and the Project Manager or another nominated Project Officer or ground support person:

- when the aircraft departs a location and on arrival at a new location (or return to original location)
- when making any unscheduled landing, or detouring away from any planned flight path
- every 30 minutes (minimum) via flight-tracking application, radio or other approved device message during the flight

If the Project Manager is not available, the responsibility will be delegated by the Project Manager to an appropriate Project Officer.

The following devices will be available:

Device	Comment	For use by
Mobile (cellular) phone	See crew contact list (Appendix C) WhatsApp group chat with air crew for general crew updates	All personnel All personnel
Satellite phone	N/A	N/A
UHF, GRN and/or VHF radio	N/A	N/A
Flight tracking application **(TracPlus)**	Login: Helisurveys1 P/w: helisurveysguest To be monitored by designated Project Officer and/or Project Manager, all staff can access	Chief Pilot, Project Manager, Project Officer
iPad	Used for mapping and aerial navigation	Aerial crew
Australian Search and Rescue (AusSAR)	1800-815-257	Pilots, Project Manager, Project Officer
On-board radio	Via headset or helmets	Pilot, marksmen, thermal camera operator
EPIRB/PLB	For emergency use only in remote situations.	Project Manager / Project Officer

Media

A media release will not be issued prior to the operation. All media enquiries must be directed to the Project Manager.

Animal welfare

Shooting must be conducted in a manner that is quick and humane, by shooting the head and/or the chest of each animal at least twice. This two-shot approach ensures a rapid death. Detailed animal welfare considerations can be found in the **National Code of Practice for feral and wild deer** and **National Standard Operating Procedure for aerial shooting feral and wild deer** (Attachments A, B).

If there are any reports or concerns about the welfare of animals, contact Clauses 4(1)(a), 6(1) (Clauses 4(1)(a), 6(1)) as soon as possible. An investigation will be instigated, and the operation will cease if required.

Landholders

Landholders are contacted at least two weeks prior to the operation. This includes landholders of the properties that are the target of the operation, as well as neighbouring properties. Landholders are also contacted within 72 hours prior to the aircraft operating over or next to their property. It is the Project Manager's responsibility to ensure contact is made with all landholders.

To be compliant with the *Firearms Act*, written consent to shoot on their property is required from all participating landholders.

Provide landholder contact information and evidence of written consent (Appendix B, Attachment J).

Landholder complaints

All landholder complaints (e.g. shooting on incorrect property, disruption to livestock, shooting in exclusion zone) are to be directed to the Project Manager for debrief, fact finding and on-site investigation with the crew. Any on-site remediation action to address the issues should be taken and the operation will either continue or be suspended until the issue(s) have been resolved and adjustments to operations (and maps) are made.

Data management

The location and species of all animals that are culled are recorded using a data logger operated by the pilot conducting the shoot. Track waypoints are also recorded via the GPS receiver every two seconds to provide track-logs for each flight. PIRSA will share relevant data with the relevant landscape board.

Thermal camera equipment records the shooting process, aiding the operation, debrief and to inform future operations. The footage recorded by the thermal and visual cameras is owned by the Contract Manager (PIRSA). Footage is labelled as "Protected" under State Government information classification and is controlled by the Project Manager. Footage is only stored for a 3-day period after each daily operation, allowing a period for review if required, and then over-written (unless otherwise agreed by the Project Manager and the flight crew).

Emergency situations

Search and rescue and scheduled check-ins

Flight tracking and Search and Rescue (SAR) will be monitored by the Project Manager and/or a nominated Project Officer. GPS tracking of the aircraft can be monitored using the TracPlus mobile phone / desktop application by all project staff in accordance with HeliSurveys flight following procedure (Attachment C). The flight following procedure will be the same under the present Aerial Operations Plan, as well as the subordinate DEW Aerial Operations Plan which covers involvement of the DEW AMT and DEW managed properties (Attachment R).

In the event of a missed call-in, and where aircraft operation cannot be confirmed using TracPlus, follow the emergency procedures contained within the Follow HeliSurveys Flight Following Procedure (Attachment C) and Late or Missing Aircraft Procedure (Attachment D). Contact emergency contacts in the order they appear in this contact list.

If contact cannot be established, an appropriate Heli Surveys emergency controller from the contact list will implement the HeliSurveys Emergency Response Plan (Attachment E) and take control of SAR. AusSAR will be implemented. The SAR Emergency Response Plan is outlined below.

Aircraft must carry an on-board first aid kit, emergency survival kit, navigational equipment, and 'crash packs' in the event of an emergency.

Follow HeliSurveys Flight Following Procedure (Attachment C)
 	
Scheduled check-in takes place at the "top and bottom of every hour" (i.e 'ops normal' every 30 mins)
 	
If alert raised by flight tracking application or **5 mins** past schedule check in):
 	
Attempt to contact aircraft and establish whereabouts
	ESTABLISH AIRCRAFT WHEREABOUTS
	• Note last location on flight tracking application to determine designated or pre-planned landing area
	• Contact:
	  • on agreed agency channel and/or satellite phone
	  • via on-ground personnel at last known location
	  • departure point/airstrip or destination
	  • on different agency channels/radios
	• Check other aircraft in area
	• Check other airstrips in area (could aircraft have diverted elsewhere?)
	• Check intermediate points in known area of operation
	• Notify relevant stakeholder (e.g. parks) and Heli Surveys Emergency Controller / Duty Officers

If by **15 mins late** and no contact via previous methods: **Follow HeliSurveys Late Missing Aircraft Procedure (Attachment D)** If Procedure is not successful, Initiate SAR Action **Follow HeliSurveys Emergency Response Plan (Attachment E)**	**SAR ACTION** • Aircraft operator Chief Pilot or Emergency Control Officer to notify AusSAR • If these cannot be contacted, AusSAR is to be notified by the on-duty Project Officer or Project Manager • Once AusSAR contacted, contact police - 000 • Prepare to mobilise resources landscape board, CFS, SES, Ambulance • Consider establishing an Incident Management Team
AusSAR Rescue Co-ordination Centre	Call 1800-815-257

Emergency evacuation

The roles and responsibilities of all personnel in an on-ground emergency or evacuation will be outlined at the pre-operations meeting. Emergency contact details are listed in Appendix C.

Follow HeliSurveys Late or Missing Aircraft Procedure (Attachment D).

Approvals for changes to operation mid-project

Any major changes to operation must be approved by the Project Sponsor.

Minor changes can be approved by the Project Manager, after discussion with relevant personnel, and may include:

- The day-to-day order of operations
- A change to personnel, when all qualifications, experiences, required licences etc. are the same (see note below re: marksmen)
- Postponement or cancellation of operations, e.g. due to weather, fire, mechanical breakdown or incident
- Inclusion of additional properties with written landholder approval mid-operation
- Exclusion of property if landholder withdraws support or permission
- Change to accommodation or operation base

Major changes are to be requested by the Project Manager to the Project Sponsor (Nathan Rhodes, Executive Director, Biosecurity) and must be approved as outlined below:

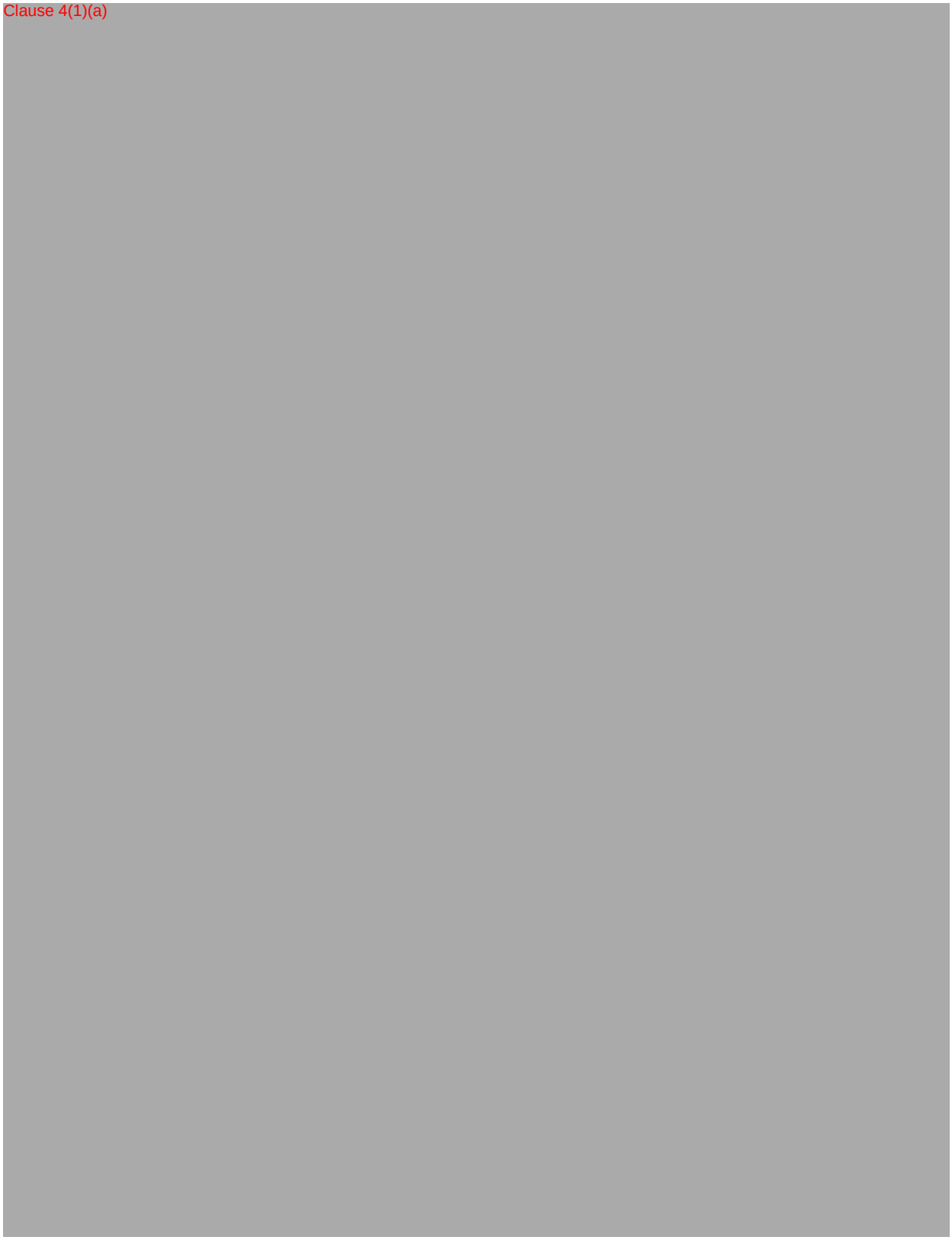
Change to operation	**Approval required from**
Major variation from Aerial Operations Plan	Project Sponsor
Substantial change to operation area	Project Sponsor
Change to a marksman (if not previously approved as part of the marksmen team)	Project Manager
Change to type of firearm being used	Project Sponsor
Change to type of aircraft	Project Sponsor
Major increase to length of operation (>10%)	Project Manager
Change to closure of a park	Manager, National Parks, and Wildlife Service, Limestone Coast – Clauses 4(1)(a), 6(1) (See Attachment R)
Spotter added to aerial operating crew	Project Manager

Primary stakeholder contact	
Department of Primary Industries and Regions	Nathan Rhodes (Project Sponsor) Executive Director, Biosecurity – Clause 6(1) Clauses 4(1)(a), 6(1) A/General Manager, Invasive Species Unit – Clauses 4(1)(a), 6(1)
Department of Environment and Water (DEW) – Aerial Marksman Team Coordinator	Clauses 4(1)(a), 6(1) Senior Project Officer – Feral Animal Management – Clauses 4(1)(a), 6(1)
Landscape Board	Clauses 4(1)(a), 6(1) General Manager, Limestone Coast Landscape Board – Clauses 4(1)(a), 6(1)
Forestry SA	Clauses 4(1)(a), 6(1) Conservation Manager – Clauses 4(1)(a), 6(1)
National Parks and Wildlife Service (ex ForestrySA Ranger)	Clauses 4(1)(a), 6(1) Senior Ranger, Lower Limestone Coast – Clauses 4(1)(a), 6(1)
National Parks and Wildlife Service	Clauses 4(1)(a), 6(1) Manager, National Parks, and Wildlife Service, Limestone Coast – Clauses 4(1)(a), 6(1)

Appendix A.1 – Draft Operations Map – Session 1 & 3

Note that a final operations map will be finalised prior to the aerial cull, which will include buffer zones. Some land access agreements are still subject to approval.

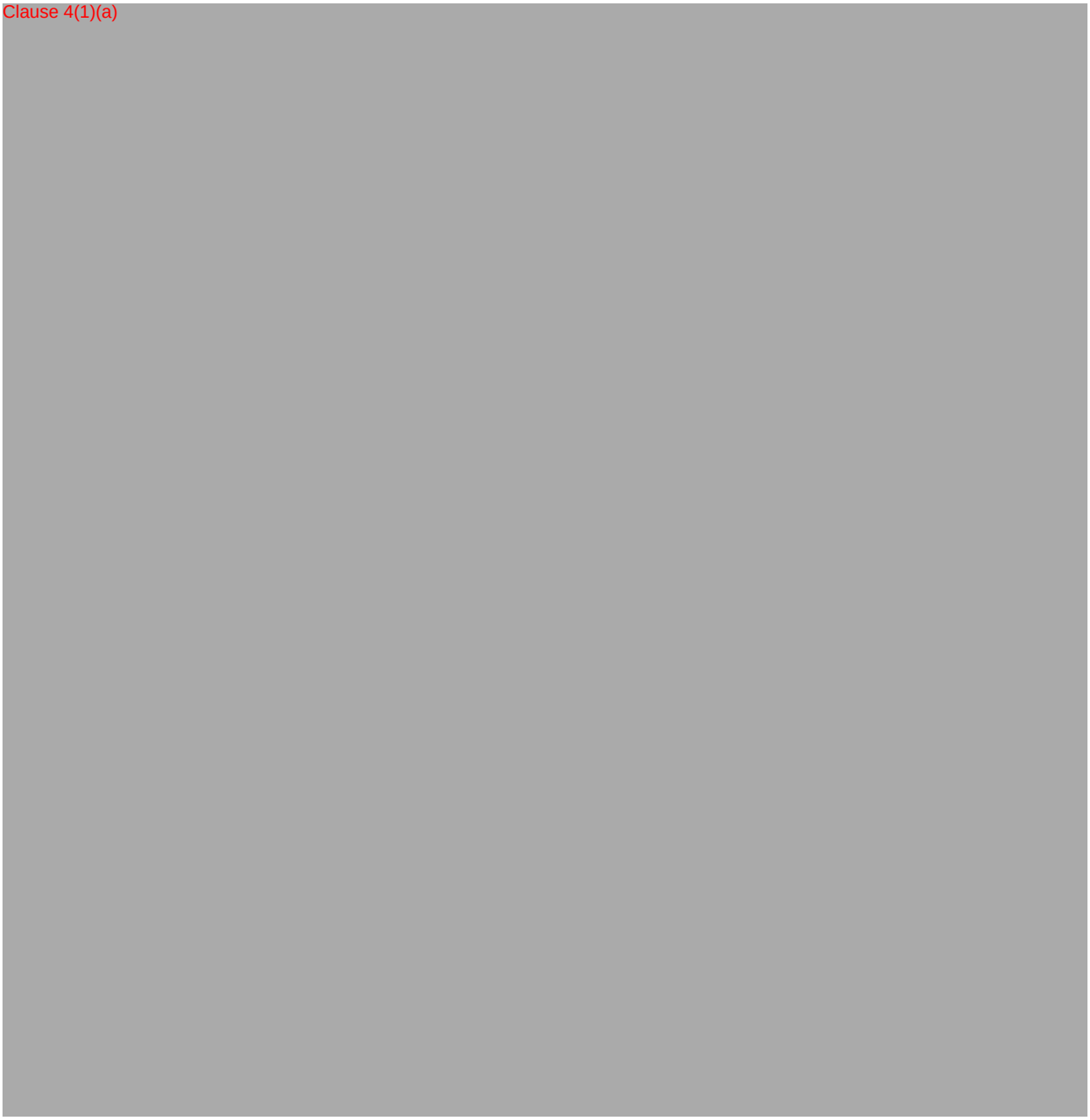
Clause 4(1)(a)



Appendix A.1 – Draft Operations Map – Session 4

Dark green shaded areas are parks, light green are private properties with final approvals. Light blue properties are private properties pending final approvals. Red lines are powerlines or transmission lines. Orange buffer areas are around public roads. Note that a final operations map will be finalised prior to the aerial cull, which will include buffer zones. Some land access agreements are still subject to approval.

Clause 4(1)(a)



Appendix B – List of attachments to this Aerial Operations Plan

Include all relevant policies, procedures, guidelines, standards etc.

Title	Organisation	Attachments
National COP for managing feral and wild deer	PestSmart	A
National SOP aerial shooting feral and wild deer	PestSmart	B
Heli Surveys Flight Following Procedure - Version 6	Heli Surveys	C
Heli Surveys Late or Missing Aircraft Procedure - Version 5	Heli Surveys	D
Heli Surveys Emergency Response Plan - March 2022 - Version 9	Heli Surveys	E
Safe Work Methods Statement (SWMS) - Heli Surveys Thermally Assisted Aerial Culling - Version 4	Heli Surveys	F
Safe Work Methods Statement (SWMS) – Two Shooter TAAC Operations	Heli Surveys	G
Heli Surveys COVID-19 Policy - Version 9b	Heli Surveys	H
Heli Surveys General Risk Register – Version 3	Heli Surveys	I
Landholders contact details / spreadsheet and evidence of approvals and consent for private land access for aerial shooting (In preparation)	Limestone Coast LB / PIRSA	J
TAAC operations Job Safety Analysis - Limestone Coast 2023	PIRSA	K
Firearms Safety - Go / No Go Checklist	Wildlife Resources Australia	L
Operation Briefing Template	PIRSA	M
Operation Debrief Template	PIRSA	N
Draft operation area maps, showing planned locations for sessions 1, 3 and 4. *(To be finalised prior to operation, digital versions provided to the flight team and A3 sized hard copies made available)*	Limestone Coast LB / PIRSA	O, P, Q
DEW/NPWS TAAC Aerial Shooting Operations Plan	DEW	R

Appendix C – Project crew contact list

Operational personnel	Name and contact details	Responsibilities
Project Manager	Clauses 4(1)(a), 6(1) (PIRSA)	• PIRSA project manager; planning and shared responsibility for on-ground coordination and SAR during operation • **On-site operations coordinator for 20-23 March (Session 1) & 1-6 April (Session 4)**
Project Officer	Clauses 4(1)(a), 6(1) (LCLB)	• LCLB operations manager; planning and shared responsibility for on-ground coordination and SAR during operation • Coordination of LCLB staff and project officers.
Project Officer	Clauses 4(1)(a), 6(1) (LCLB)	• As above • **On-site operations coordinator for 23-26 March (Session 1)**
Project Officer	Clauses 4(1)(a), 6(1) (LCLB)	• As above • **On-site operations coordinator for 27-31 March (Session 3)**
Chief pilot	Clauses 4(1)(a), 6(1) (Heli Surveys)	• Ensuring compliance with relevant legislation and safety requirements for operation of aircraft during aerial culling operation
Chief marksman	Clauses 4(1)(a), 6(1) (Wildlife Resources)	• Ensuring compliance with relevant legislation and requirements for safe and legal operation of firearms + humane destruction of feral deer
Secondary marksman	Clauses 4(1)(a), 6(1) (Wildlife Resources)	• As above
Tertiary marksman	Clauses 4(1)(a), 6(1) (Wildlife Resources)	• As above
Fourth marksman (See Attachment R)	Clauses 4(1)(a), 6(1) (DEW AMT) – Clause 6(1) / Clauses 4(1)(a), 6(1) (DEW AMT) – Clauses 4(1)(a), 6(1)	• As above
Thermal camera operator	Clauses 4(1)(a), 6(1) Clauses 4(1)(a), 6(1)	• Detection of feral deer • Ground support
Emergency contacts		
Emergency services (police, ambulance, fire)	000	
SA Police call centre	131-444	
AusSAR AMSA Aviation 24hr helpline	1800 815 257	
Kingston Soldiers Memorial Hospital	(08) 8767 0222	
Keith Hospital	(08) 8755 1555	
Naracoorte Hospital	(08) 8762 8100	
Meningie Hospital	(08) 8575 2777	
Beachport SAPOL	(08) 8735 8009	
Coonalpyn SAPOL	(08) 8571 1092	
Goolwa SAPOL	(08) 8555 2018	
Keith SAPOL	(08) 8755 1211	
Kingston SAPOL	(08) 8767 2009	
Lucindale SAPOL	(08) 8766 2200	
Meningie SAPOL	(08) 8575 1202	
Millicent SAPOL	(08) 8733 3622	
Naracoorte SAPOL	(08) 8762 0466	
Robe SAPOL	(08) 8768 2118	

PIRSA

Thermal assisted aerial culling (TAAC) of feral deer

JOB SAFETY ANALYSIS

Prepared by	Signature	Date
Clause 4(1)(a)	Clause 4(1)(a)	28.02.2023

Scope

This Job Safety Analysis (JSA) supports the *Thermal assisted aerial culling (TAAC) of feral deer: Operations Plan.*

Legislative requirements

When conducting aerial culling operations, the Supplier must comply with the requirements of the *Work Health & Safety Act 2012*. For a full list of relevant legislation, refer to the Operations Plan.

Legislation	**Comment** ***(points are not the exhaustive requirements under each legislation but refer to critical considerations)***	**Tick to acknowledge compliance**
Work Health & Safety Act 2012	• Suppliers/aerial operator must have their own WHS processes, policies and procedures that ensure compliance with the legislation, or adopt relevant PIRSA processes, policies and procedures	

* includes all subordinate legislative instruments, such as Regulations, Orders and Notices.

Risk assessment

An assessment of project risks was completed as per the PIRSA Risk Matrix (Appendix A).

Overall project risk	
Overall project risk rating	**LOW**

Project deliverables risks					
Hazard	**Causes**	**Mitigation strategy**	**Risk rating – controlled risk**		
			Consequence	**Likelihood**	**Risk Rating**
Aircraft breakdown	• Mechanical malfunction • Fuel shortage	• Aircraft serviced at required/logbook intervals • Aircraft safety inspection completed prior to each flight • Fuel requirements to be calculated and arranged by aerial operator • **Refer to Heli Surveys - OH&SMS Manual, Version 6** • **Heli Surveys General Risk Register, Version 3**	***EXTREME***	***MEDIUM***	***MEDIUM***
Inclement weather	• Weather not suitable for flight or thermal imagery operations, e.g. wind or heat	• Check weather forecast regularly • Observe conditions prior to departure • Cease operation if weather deteriorates mid-flight	***MEDIUM***	***LOW***	***MEDIUM***
Flight hazards	• Powerlines, towers, dwellings, livestock	• Extensive desktop survey and mapping completed prior to operations	***HIGH***	***LOW***	***LOW***

		• **Refer to Heli Surveys - OH&SMS Manual, Version 6** • **Heli Surveys General Risk Register, Version 3**			
Firearm incident	• Accidental discharge of firearm • Improper storage or transport of firearms or ammunition • Loose articles in the aircraft cabin	• Legislation and any agency policy and procedure are followed • All people handling or operating a firearm must be licenced • Firearms are clear and checked by pilot before approaching or loading onto aircraft • **Refer to National SOP for aerial culling of feral deer** • **Refer to Firearms Go / No Go Checklist (Wildlife Resources Australia)** • **Refer to Safe Work Methods Statement –Thermally Assisted Aerial Culling, Version 4 (Heli Surveys)** • **Refer to Safe Work Methods Statement – Two Shooter TAAC Operations (Heli Surveys)**	***HIGH***	***LOW***	***LOW***
Shooting or flying over properties without permission	• Landholder permission not gained • Incorrect maps	• Extensive desktop survey and mapping completed prior to operations • Written permission gained from landholders prior to operation • Mapping and landholder permissions to be checked by manager or other senior staff member • Reminders to land holders and neighbours prior to operation • Buffer zones added to the perimeter of each property not part of the operation	***HIGH***	***LOW***	***LOW***
Disgruntled landowners and public	• Spooked livestock • Operation over property not approved • Animal welfare concerns • Public opinion does not align with operation	• Extensive engagement with landholders and other stakeholders prior to and throughout operation • 300-500 metre buffer applied to all houses in operation zone • Extensive notification through local government, visitor information centres and neighbours	***MEDIUM***	***LOW***	***LOW***

	• Claims they were unaware of operation	• Maps to be viewed at all times in flight by pilot • Recce flights may be required to scout for hazards			
Communication device failure	• No communication between ground and air crews	• Multiple communication pathways are available to accommodate varying phone coverage and device breakdown (WhatsApp, Phone, Tracplus)	***MEDIUM***	***LOW***	***MEDIUM***
Personnel do not know their roles and responsibilities	• Errors made in the operation, which could have major or minor impact	• Operation well-planned in advance, incl. completion of this Operation Plan • Pre-operation briefing • Daily briefings during operation • Helicopter induction prior to first flight, and each time there are new aerial crew • Post-operation briefing • Other updates as required • **Refer to Safe Work Methods Statement –Thermally Assisted Aerial Culling, Version 4 (Heli Surveys)** • **Refer to Safe Work Methods Statement – Two Shooter TAAC Operations (Heli Surveys)**	***HIGH***	***LOW***	***LOW***
Pilot and marksmen fatigue	• Errors are made in operation	• Scheduled/required rest days are taken • Multiple people in roles for rotation on long jobs • Flight times and frequency appropriate for managing fatigue, and may include 5-10 min breaks within a flight • Crew fatigue to be monitored by the Pilot and Chief Marksman • **Refer to Heli Surveys - OH&SMS Manual, Version 6** • **Heli Surveys General Risk Register, Version 3**	***EXTREME***	***MEDIUM***	***MEDIUM***
Element exposure to aerial crew	• Flight crew become ill and cannot operate	• Appropriate PPE worn, e.g. flight suits, helmets, visor, gloves	***MEDIUM***	***LOW***	***LOW***
Air crew fall out of aircraft (as flying with doors off)	• Faulty harness or belt	• All harness and belts regularly inspected for condition	***HIGH***	***MEDIUM***	***LOW***

Personnel acquire COVID-19	• Flight crew become ill and cannot operate	• COVID policies and procedures have been developed and will be followed. These incorporate advice from SA Health • Full vaccination recommended • **Refer to Heli Surveys COVID-19 Policy, Version 11**	***HIGH***	***MEDIUM***	***MEDIUM***
Emergency evacuation	• Natural disaster	• Action and responsibilities outlined at pre-operation meeting with evacuation plan in place • Monitoring of weather and fire ratings	***HIGH***	***LOW***	***LOW***
Animal welfare concerns	• Animals are not killed humanely, and may be left wounded	• Firearms are fit-for-purpose • **Refer to National and PIRSA SOP for aerial culling of feral deer**	***MEDIUM***	***LOW***	***LOW***
Non-program personnel on site (usually parks)	• Affect operations • Risk of being shot	• No other groups or works will take place in operation areas while shooting operations are conducted • Marksmen only shoot at identified targets • Thermal technology further reduces the risk of non-targets being shot • Operations cease in the immediate area	***MEDIUM***	***LOW***	***LOW***

Appendix A – Risk matrix

Consequence Category – Project

Impact		Consequence				
		1 Insignificant	2 Minor	3 Moderate	4 Major	5 Catastrophic
Project	Time	Insignificant impact on project milestones	Minimal impact on project milestones	Significant impact on project milestones	Severe impact on project milestones	Vital or legislative deadlines not met
	Project Deliverables	Meets majority of requirements	Some project requirements not met	A number of key requirements not met	Significant requirements not met	Major deficiencies with project deliverables
	Cost	Justifiable additional costs that can be absorbed in the project's budget	Additional costs requiring reprioritisation and/or reallocation of available funds	Additional costs (> 15%) requiring submission for supplementary funding	Significant additional costs (>25% of the approved budget)	100% of budget expended without achieving any key deliverables

Likelihood

Impact		Consequence				
		1 Insignificant	2 Minor	3 Moderate	4 Major	5 Catastrophic
Likelihood	**Almost Certain** *Is expected to occur in most circumstances.* *Will occur at least once per month* *>1 in 10*	LOW	MEDIUM	HIGH	EXTREME	EXTREME
	Likely *Will probably occur in most circumstances* *Will occur at least once per year* *>1 in 10 - 100*	LOW	MEDIUM	HIGH	HIGH	EXTREME
	Possible *Might occur sometime* *Will occur once every 2-5 years* *>1 in 100-1000*	LOW	MEDIUM	MEDIUM	HIGH	HIGH
	Unlikely *Could occur at sometime* *Will occur once every 5-20 years* *>1 in 1000-10000*	LOW	LOW	MEDIUM	MEDIUM	HIGH
	Rare *May occur in exceptional circumstances* *Will occur once every >20 years* *>1 in 10000 – 100000*	LOW	LOW	LOW	MEDIUM	HIGH

Attachment M – Aerial Shoot Briefing

Doc 13

Operation location:

- **Session 1** (Mon 20 Mar to Sun 26 Mar): Forestry and adjoining private land around the Wattle Range and Penola, including relevant parks and reserves
- **Session 3** (Mon 27 Mar to Fri 31 Mar): Forestry and adjoining private land around Mount Gambier, including relevant parks and reserves
- **Session 4** (Sat 1 to Thur 6 Apr): Duck Island / Willoway / Glenstrae / thick vegetated private properties and parks in the Gum Lagoon and Coorong areas

Conducted by: Date: / /

Present:

Mission

Safely and humanely undertake a thermally assisted aerial shooting operation for feral deer as part of any and all aerial shoots undertaken as part of the SA feral deer eradication program.

Mission priorities (in order)

1. The physical and mental safety and wellbeing of all staff involved
2. The humane destruction of feral deer
3. To maintain the reputation of all agencies involved in feral deer control in the Limestone Coast Region

Purpose

Mitigate the impacts and reduce the population of feral deer in the Limestone Coast region. This operation's focus will be on native vegetation parks and reserves as well as in some private land to take advantage of feral deer preference for cover.

Logistics

- Operation to be undertaken from 20 March to 6 April 2023
- There will be at least two shooting runs per day (dawn and dusk) – weather and operational circumstances permitting. Refer to National SOP Aerial Shooting Feral and Wild Deer
- Controlled feral deer data as well as tracklogs will be recorded by the pilot
- Thermal video footage will be recorded by the camera operator and kept for three days before being deleted. Other project staff are not to review the footage without permission from the Project Manager
- All firearms are to be managed by the marksmen. Firearms are to be correctly sighted-in and inspected between each use
- Firearms are to be stored securely by the marksmen
- Ammunition is to be managed by the marksmen, and the project Managers/Officers as required

- All equipment to be used in the operation is to be stored correctly at base camp, fully charged and spare equipment accessible
- Minimum CASA flight altitudes are required when flying over private lands outside of the survey area
- Operational detail outlined in ASOP along with roles and responsibilities (Run through ASOP with crew in pre-flight briefing)

Command and Communication

- Confirmation and familiarisation of all relevant operational participants of the HeliSurveys WhatsApp application chat "SA Feral Deer Eradication" and how it will be used
- Radio communication between helicopter and Ground Support to be confirmed
- Flight following via TracPlus managed by The Project Manager/Project Officer/HeliSurveys (*confirm who and how*)
- When airborne contact to be made at minimum every 30 minutes (either message or via location check on TracPlus if reliable internet service/SPOT device message)
- Australian Search and Rescue (AusSAR) protocols will be maintained by Pilot and Ground Support/HeliSurveys
- Media strategy - media actively may be sought for operation prior to undertaking it by the minister's office. Any enquiries will be directed to the Project Manager, Clauses 4(1)(a), 6(1)
- Consultation with NPWS and Limestone Coast Landscape Board to ensure all clear to proceed
- Confirm that all park users have been notified of operation
- Confirm neighbours have been notified of operation
- Confirm daily fire danger level and mitigation with Fire Management Officer
- Confirm and remind participants of the emergency procedures/evacuation plan and maps - Escalation process confirmed (refer ASOP)

Confirm helicopter number and call-sign

See Approved Aerial Shooting Operations Plan for full Contact List

Operation Zones, Buffer Zones & Exclusion Zones

Shooting can only occur in the identified operation zones. These zones will be outlined at briefings and illustrated on operation maps, and/or maintained by the pilot.

Areas that the aircraft cannot fly into at low altitude are called exclusion zones. Areas that the aircraft can fly into at low altitude, but no shooting is permitted, are called buffer zones. Exclusion zones and buffer zones may be identified to avoid flying or shooting over landholders who have not provided consent for either or both activities, or around hazards, such as powerlines and towers, or areas associated with an identified feature to reduce the risk of shooting in an exclusion zone or a firearm-related incident. Buffer zone distances include:

- 500 metres either side of a major public road
- 150 metres either side of a minor public road
- 300 - 500 metres in any direction from housing (this may be reduced with landholder permission)
- 100 metres from the operation zone boundary
- 250 metres in any direction from any vehicle
- 250 metres in any direction of a person on private land in or near a vehicle

Other distances for buffer zones may be appropriate in different projects and locations. Shooting must not occur in any exclusion zone. CASA regulations stipulate that shooting can never take place within 300m of the property of someone who objects to the aerial shooting operation.

A reconnaissance flight may be undertaken prior to the operation to confirm the location of exclusion zones and known hazards. Any request to access an exclusion zone will require approval from the Project Manager.

Exclusion zones, buffer zones, known hazards and recreation sites will also be clearly marked on operational maps.

Aircraft operations must also prevent stress to livestock. Some landholders will advise of exclusion zones in the planning stage, but the aircraft pilot must always fly to prevent stress to livestock on any property.

If a person is identified on foot in private scrub, all operations in the area are to cease until the area is cleared.

The aircraft can land on any property if an emergency landing is required

Animal Welfare

- Shooting must be conducted in a manner which causes rapid death. This requires the use of appropriate shot placements, appropriate firearms, and ammunition as per the National SOP for Aerial Shooting of Feral and Wild Deer
- Target animal must be confirmed by the Camera operator and shooter or pilot before being shot
- It is essential that a deliberate policy of 'overkill' be followed where a minimum of two shots are used per animal. That is, after an initial head/chest shot, another shot/s must be fired into the chest to ensure death
- Any wounded animal in a group will be killed immediately before any further animals are targeted and shot, with all animals targeted confirmed dead before continuing with operations
- Refer: National SOP Aerial Shooting Feral and Wild Deer

Work Health & Safety

- Applicable SA Health COVID-19 hygiene and social distancing to be adhered to as well as:
    - HeliSurveys COVID-19 procedure
- All staff must adhere to the WHS documents of all involved organisations, all documents will be made available on site:
    - Job Safety Analysis – Aerial Culling Operations
    - HeliSurveys – SWMS - Thermally Assisted Aerial Culling, Version 4
    - HeliSurveys - SWMS - 2 Shooter TAAC Operations, Version 2
    - HeliSurveys – Pre-work Assessment, Version 1
- Operation delivery is guided by the National SOP Aerial Shooting Feral and Wild Deer
- Pilot to provide pre-flight briefing of helicopter operations, safety, etc.
- All personnel to be confident of all operational requirements prior to undertaking any aerial culling with adequate time spent on the ground becoming familiar with equipment and procedures
- Ensure shooting position is satisfactory and empty shell cases are ejected so they do not enter the cabin – the possible need for a 'shell catcher' or shell deflector to be used will be confirmed prior to operations proceeding
- PPE - Specific requirements for the operation – marksman safety equipment (helmet, flight suit, hearing protection, 'crash-pack'), harness, cold weather protection, etc., confirmed
- STEPBACK principles and dynamic risk assessment approach reminder to all involved
- All vehicles and aircraft to have first aid kit and fire safety (extinguisher, fire blanket, etc.)
- Personal first aid kit required when away from vehicle/aircraft
- If both iPads used for mapping fail/lose GPS during while flying, operation is to cease until function is restored
- Incident reporting will follow the Gov SAfety process (within 24-hr)
- Personnel understand and acknowledge the mental burden and fatigue from aerial culling activities.
- All personnel confident and satisfied with safety/procedures/process, etc.

Hard copies of critical project documents & maps can be found in hard copy in the provided dossiers

Basecamp

- Facilities are set up and functioning before operational staff arrive
- Facilities and consumables are managed by PIRSA and the Limestone Coast Landscape Board, if inadequate personal are to notify the Project Manager
- All personnel to be confident with basecamp set up and equipment on hand
- All personnel to understand use of power and water systems
- Basecamp fire extinguisher and first aid equipment locations are to be known to all staff
- Effective rubbish disposal (general and recycling) is to be use by personnel

Debrief

- There may be a daily debrief -- issues to include safety, communications on board helicopter, animal /flight approach, and any other issues as raised by the participants
- Upon completion of operation a formal debriefing session will be held to discuss issues and identify learnings and options for any future operations

Questions?

To be signed once brief has been conducted:

I declare that the above information was clearly communicated to all participants involved in the shoot.

Project Manager:

Signed: Date:

Project Manager:

Signed: Date:

Project Manager:

Signed: Date:

Marksman 1:

Signed: Date:

Marksman 2:

Signed: Date:

Marksman 3:

Signed: Date:

Pilot:

Signed: Date:

Camera operator:

Signed: Date:

Autumn 2022 Thermally Assisted Aerial Cull - Debrief

Region:	Limestone Coast
Location of Operation:	**"Session 1" (Mon 20 Mar to Sun 26 Mar):** Forestry and adjoining private land around the Wattle Range and Penola include relevant parks and reserves. **"Session 3" (Mon 27 Mar to Fri 31 Mar)**: Forestry and adjoining private land around Mount Gambier including relevant parks and reserves. **"Session 4" (Sat 1 to Thur 6 Apr)**: Duck Island / Willoway / Glenstrae / thick vegetated private properties and parks in the Gum Lagoon and Coorong areas.
Activity date/s:	20-03-23 to 6-04-23
Prepared by:	Clauses 4(1)(a), 6(1)
Personnel:	Project Manager: Marksmen: Pilots: Camera operator: Ground Support:

1. Preparation

Operational procedures in place

-

Logistical support, equipment, comms strategy

-

Notifications (private lands holders as well as to the public)

-

2. Implementation

Operational Briefing

-

Equipment

-

Flying operations

-

Reconnaissance/Reports/Intel

-

Animal Welfare

-

Mapping

-

Base camp

-

Communications

-

Environmental considerations

-

3. Health and Safety Issues

Wellbeing issues

-

Near misses

-

Emergency procedures

-

COVID

-

SAR and flight following

-

PPE

-

Fatigue management

-

4. External

Community

-

Political issues

-

Media

-

5. Other

Thermally Assisted Aerial Cull data

Average flight time per day (total)	
Total area covered (ha)	
Total flight time	
Total operation days	
Total feral deer killed	
Other species killed	

Feral deer types

Type	**Killed**	**Percentage of killed animals**
Fallow		
Red		
Sambar		
Chittal		
Un-ID		

Detection Method Summary

Detected by	**Percent**	**Detected by**	**Percent**
Visual		**Pilot (Visual)**	
Thermal		**Camera Operator**	
Unknown		**Marksmen**	

Tracklog Map

Aerial Shooting Operations Plan (ASOP)

Control of feral deer in Department for Environment and Water (DEW) reserves, Forestry SA reserves and private lands, of the Limestone Coast, utilising Thermal Assisted Aerial Culling (TAAC) with both contract and DEW marksmen.

Prepared by: Clauses 4(1)(a), 6(1) Limestone Coast, DEW
Date Prepared: 08/03/2023

Attachments:

1. Map 1: Session 1 Operations Map
2. Map 2: Session 4 Operations Map
3. Operation Briefing template
4. Operation Debrief template
5. DEW SOP Aerial Shooting
6. DEW Job Safety Analysis (JSA): *Aerial Culling Operations*
7. HeliSurveys - Flight Following
8. HeliSurveys - Late or Missing Aircraft Procedure
9. HeliSurveys - Emergency Response Procedures
10. HeliSurveys - SWMS - Thermally Assisted Aerial Culling
11. HeliSurveys – 2 Shooter TAAC Operations
12. HeliSurveys – General Risk Register
13. HeliSurveys COVID-19 procedure
14. COVID-19 procedures
15. Wildlife Resources Australia – Firearms Go No Go checklist
16. ASOP Planning checklist
17. Landholder details spreadsheet
18. National Standard Operating Procedure: Aerial Shooting of Feral and Wild Deer

Approvals

1. Wildlife Programs Project Officer:

Name and Position Title	Signature	Date	Endorsed/Not endorsed
Clauses 4(1)(a), 6(1) **Senior Project Officer Feral Animal Management**			

2. Manager:

Name and Position Title	Signature	Date	Endorsed/Not endorsed
Clauses 4(1)(a), 6(1) **National Parks and Wildlife Service Manager, Limestone Coast**			
Clauses 4(1)(a), 6(1) **A/General Manager – Invasive Species Unit, PIRSA**			
Clauses 4(1)(a), 6(1) **General Manager, Limestone Coast Landscape Board**			

3. Third level of approval:

Name and Position Title	Signature	Date	Approved/Not approved
Clauses 4(1)(a), 6(1) **Director, Regional Operations**			
This approval permits contract marksman to operate and use firearms on reserves in accordance with Regulations; 7, 19 and 23 of the *National Parks and Wildlife (National Parks) Regulations 2016* under the *National Parks and Wildlife Act, 1972*, under contract arrangements with PIRSA.			

Region:	Limestone Coast
Date and Location of Operation:	TAAC operations will occur over 15 DEW reserves and subject to required approvals outside DEW, numerous Forestry Reserves and private lands in the vicinity of the reserves through agreements obtained by PIRSA/LCLB: Session 1 (23 -25 March 2023) • Big Heath CP • Glenroy CP • Mary Seymour CP • Penola CP • Calectasia CP • Telford Scrub CP • Gower CP • Furner CP Session 4 (1 – 4 April) • Gum Lagoon CP • Tilley Swamp CP • Jip Jip CP • Hansons Scrub CP • Martin Washpool CP • Bunbury CR • Messent CP

Background:

Feral deer are pest animals declared under the *Landscape South Australia Act 2019* (the Act) and their control is a high priority natural resource management issue for the Limestone Coast region, being the focus of the ambitious new South Australian Feral Deer Eradication Program. The key threats of feral deer are to the environment (impacts on native species), to agriculture (damage to infrastructure, risk of disease) and to public safety (traffic hazards).

Feral goats are also a high priority natural resource management issue and the region's policy on feral goats reflects this with the aim of eradication. Feral pigs have also recently been reported in the region, therefore they are a high priority to control in order to prevent their establishment.

This operation contributes to a broader program of control aimed at achieving regional feral deer eradication that includes raising community awareness, maximising landholder participation, ensuring compliance with legislation and removing as many feral deer possible from the regional landscape. In addition, the program aims to test and evaluate new aerial control methods which have not historically been used by DEW.

This operation will be the first application to trial the modified Thermal Assisted Aerial Culling (TAAC) format in DEW reserves. It consists of a thermal camera operator and two marksmen on board the helicopter at the same time, one with a Clause 4(1)(a) and the other a Clause 4(1)(a). Thermal imagery equipment can increase the detection of animals during the early morning and late afternoon, as well as in overcast conditions, especially in dense vegetation.

The Department of Primary Industries and Regions (PIRSA) is responsible for operational delivery of the project which occurs collaboratively with the following stakeholders:

- Limestone Coast Landscape Board (LCLB)
- Department for Environment and Water
- ForestrySA (FSA)
- Private Landholders

Purpose:

The key objectives of the project are:

- Implement aerial control programs for localised eradication of deer using a modified TAAC approach

- Increase landholder participation and awareness in feral animal control

Scope:
PIRSA and the LCLB are undertaking a wide ranging aerial shooting program separated into four sessions in the Limestone Coast during March and April 2023. This ASOP will only apply to TAAC operations where DEW marksman are involved and DEW reserves are targeted. Private land and FSA reserves will also be targeted by participating DEW marksmen where agreed by PIRSA as the coordinating agency.

A separate ASOP has been developed by PIRSA to provide for TAAC operations where contract shooters only are engaged by PIRSA over private and FSA reserves.

Targeted Species:
The primary focus will be all species of feral deer (Fallow, Red, Rusa, Sambar, Chital and Hog). When operating over DEW reserves other feral animals such as feral pigs, feral goats and foxes will be targeted where encountered as a secondary focus, where it does not impact on the targeting of deer.

Operational Communication Requirements:
A combination of communication devices will be required for the program and will be used dependent on the coverage available. Devices include;

- Cellular/mobile phone
- *TracPlus* (cellular and satellite based) flight tracking will be used for monitoring helicopter flights.
- UHF & VHF radio communications - channels will be confirmed at briefing
- EPIRB/PLB
- Australian Search and Rescue (AusSAR) – maintained by Pilots.

Phone contacts and radio channels will be provided and confirmed as a part of the program briefing with ground to air communications in place for operational aspects of the program.

On board communications between pilot, thermal camera operator and marksmen occurs via on-board radio through headsets/helmet.

All participating staff must have good operating knowledge of the communication plan and protocols prior to departure.

Scheduled Calls

Situation: Field staff (Heli crew) to Project Manager (Clauses 4(1)(a), 6(1))*/Operations base

- Communication devices to be utilised: mobile phone (numbers listed in Emergency Evacuation Plan – below), radio communications.
- Monitoring devices to be utilised: *TracPlus*
- Contact to be made at minimum every 30 minutes (either message or via location check on *TracPlus*).
- Contact to be made when leaving destination and when reached destination (i.e. returning to base), and upon unscheduled landing.
- Contact in descending order until contact achieved; Project Manager, HeliSurveys' Duty Officer, Parks Duty Officer, Ground Support Officer

*In the event the Project Manager is unavailable to manage the scheduled calls/*TracPlus*, the nominated Project Officer will undertake this role, or an appropriate project team member will be requested to take the duties. Suitable induction will be involved in the handover of duties.

Clauses 4(1)(a), 6(1) (PIRSA) will be the primary Project Manager for the operation, but throughout the 3 weeks of the operations there will be rostered Project Officers with on-site management responsibilities. This has been rostered as follows:

Session 1:

- *20-23 March* - Clauses 4(1)(a), 6(1) Project Manager and on-site Project Officer, to perform pre-flight briefing and handover to Project Officer's Clauses 4(1)(a), 6(1) and Clauses 4(1)(a), 6(1)
- *23-26 March* – Project Officer, Clauses 4(1)(a), 6(1) on-site manager.

Session 4:*1-6 April* - Clauses 4(1)(a), 6(1) on-site manager

WH&S:
Operational safety procedures have been developed for this project as outlined in this document. It should be used in conjunction with relevant DEW field work procedures as well as applicable documents/procedures from HeliSurveys as well as those utilised by Wildlife Resources Australia.

The Project Manager and in their absence the nominated Project Officer will be present to monitor helicopter activities, general wellbeing of all staff and operational progress. While in the air the helicopter's progress can be monitored by the Project Manager or nominated Project Officer as well as HeliSurveys staff in accordance with their safety procedures.

Aerial operations under this ASOP will be based from two locations:

Session 1: Clause 4(1)(a)

Session 4: Clause 4(1)(a)

- The use of the AS350 B2 (Squirrel) helicopter enables a safe work platform for four personnel involved (pilot, two marksmen and camera operator).
- The helicopter will return to base every three hours or sooner for refuelling. Run times and frequency will be planned to manage fatigue and payload.
- If required short breaks e.g. 5-10 min mid run may be taken to allow the team to break the run, stretch their legs and refresh before continuing with operations
- Ground to air communications will be in place with the aircraft as well as monitoring progress through *TracPlus*.
- Clear communication will occur during flight between the team to ensure any hazards are addressed, animals are clearly identified and the approach to engage the animal is clear, with the nominated shooter confirmed.
- A clear process will be outlined for the two shooter operation, switching between active shooters on the right and left hand side of the helicopter. The two shooters are never used at the same time, and the pilot will determine which marksman is 'active' at any given time.
- Known hazards such as power-lines, towers, dwellings and livestock will be identified on operational maps along with any no shoot/buffer or exclusion zones. Any new hazards identified will be addressed as part of the daily briefings.
- Risks to public will be minimised by closing the relevant DEW reserves (listed on DEW park closure website) and erection of park closure signage at each reserve. The Limestone Coast Landscape Board will ensure that neighbour notifications are completed. Signage will be placed on key gates and locations, as well as on-line notifications for FSA reserves involved.
- All equipment on board the helicopter will be stored, used and secured appropriately, with payload limits and operational requirements determining what can be carried and used.
- In the case of an emergency associated with helicopter operations HeliSurveys' safety procedures apply and are implemented by their staff. All project staff are to be fully briefed prior to commencement of aerial activities on roles, responsibilities and safety procedures.
- All staff will have appropriate PPE; for marksman, camera operator and pilot, this includes helmet, flight suit and ear plugs/ANR head-set, approved harness, thermally insulating clothing for cold weather.
- If at any time the DEW marksman or any other team member has any concerns about the safety of the operation they are able to request an immediate stop to the flight. Depending on the situation the helicopter will either put-down or return to base. The matter will be discussed with the Project Manager and if required escalated to the NPWS Director, Regional Operations for further direction. The resumption of the operation will depend on the outcome agreed to by all involved.

More specific WH&S issues and their treatment have been identified in the attached Job Safety Analysis and HeliSurveys *Safe Work Method Statements*

Refer to:
DEW SOP Aerial Shooting, DEW JSA Aerial Culling Operations
HeliSurveys - Safe Work Method Statement (SWMS)

COVID-19 - all staff and contractors will be required to adhere to SA Health, DEW and HeliSurveys protocols. These protocols apply to all situations for the duration of the operation. All staff members to be in good health (do not attend if unwell) and full COVID-19 vaccination recommended. Good general hygiene practices are observed and regularly clean and disinfect surfaces and equipment that people touch/use and don't share equipment unless wiped down.

In the instance of a COVID-19 positive case occurring amongst the team departmental and SA Health guidelines will be followed.

Refer to: DEW COVID-19 guideline documents and HeliSurveys – COVID-19 Plans – SA

Emergency Evacuation Plan:
A pre-operation meeting will be held by the Project Manager to familiarise operation personnel involved with an Emergency Evacuation as to their roles and responsibilities.

In the event that an emergency evacuation is required, the following would be contacted as relevant (refer to HeliSurveys - Emergency Response Plan):

- Project Manager – Clauses 4(1)(a), 6(1) – Clauses 4(1)(a), 6(1)
- Project Officer/Ground Support;
  - Clauses 4(1)(a), 6(1) Operations Manager, (LCLB) – Clauses 4(1)(a), 6(1)
  - Clauses 4(1)(a), 6(1) Clauses 4(1)(a), 6(1) (LCLB) - Clauses 4(1)(a), 6(1)
- National Parks – Regional Duty Officer – Clauses 4(1)(a), 6(1)
- Upper LC District Ranger – Clauses 4(1)(a), 6(1) – Clauses 4(1)(a), 6(1)
- Lower LC District Ranger – Clauses 4(1)(a), 6(1) – Clauses 4(1)(a), 6(1)
- AusSAR AMSA Aviation 24hr helpline – 1800 815 257
- Regional emergency services - see *Key Contacts* section

Emergency Response Plan:

Search and Rescue (SAR) - Initiation Procedures

The Project Manager or a nominated project officer will monitor *TracPlus* with emergency procedures initiated with AusSAR.

The Project Manager will maintain a Flight Following record (see below) with the helicopter. Prior to departure the following information will be recorded:

- relevant helicopter registration
- planed flight route and destinations
- departure time and flight duration time
- name of pilot, camera operator and marksmen on-board.

In the event of a missed report the following will be initiated:

If alert raised by TracPlus or **5 mins past schedule check in** (every 30 mins):
 	
Attempt to contact aircraft and establish whereabouts
	• Note last location on *TracPlus* to determine if designated or pre-planned landing area.
	• Contact:
	  • On agreed Agency channel
	  • Via on-ground personnel at last known location
	  • Departure point/airstrip or destination
	  • On different Agency channels/radios
	  • Via other aircraft in area
	• Check other aircraft in area
	• Check other airstrips in area (could aircraft have diverted elsewhere?)
	• Check intermediate points in known area of operation
	• Notify Park's and HeliSurveys' Duty Officers

If no contact via previous methods after 15 minutes: **Initiate SAR Action.**	• Follow **HeliSurveys – Late or Missing Aircraft Procedure** • HeliSurveys or Project Manager will notify AusSAR (**1800 815 257)** – of an "Awareness Phase" – Call sign, aircraft type, etc.
If no contact after **30 mins** from nominated SAR	• HeliSurveys or Project Manager will notify AusSAR – to start a "Search Phase" • Contact police and emergency services – 000 • Prepare to mobilise resources DEW/KILB/CFS/SES/ Ambulance • Consider establishing an IMT • Notify Regional Managers

Refer to: HeliSurveys – Flight Following Procedures

Site Clearance/Communications:

- Staff are to direct any media enquiries regarding the operation to the Project Manager – Clauses 4(1)(a), 6(1) . The Project Manager will also liaise with LCLB and LC NPWS around any media enquires or releases, with General Manager of the Invasive Species Unit providing any media response in consultation with the NWPS Director, Regional Operations.
- Notifications to DEW public lands and Drainage Board staff, contractors, neighbours (adjoining landholders within 500m of DEW reserves) and interest groups will be completed by LCLB and occur at least two weeks prior to the operation. Other communications will be done through notices sent to Local Government, Visitor Information Centres and neighbours, with information posted on the Parks SA as well as the FSA website prior to the relevant closures.
- Any relevant campsites/accommodation managed by DEW will be made unavailable (booked-out on-line).
- All landholders will be contacted 72-hrs prior to operations on their property by the Project Manager to confirm operations.
- Closure of reserves entry points with the use of signage, existing gates and bunting.
- No other works will take place in operational zones while shooting operations are being undertaken.
- Staff (PIRSA, DEW, Landscapes) in the region will be made aware of the operation prior to it occurring.
- If public are reported within a closed reserve aerial operations will cease in that area (moving to the next approved section/site) until the Project Manager or investigates and ensures it is safe to return. A near miss investigation (incident – no injury) in Gov SAfety will be conducted.
- The risk to individuals is minimal due to the thermal technology used for target detection as well as double target confirmation from two personnel on-board.. All precautions will be undertaken to ensure maximum safety to flight crew and public.
- Any issues/clarification required regarding site access and confirmation of operations are to be referred to the Project Manager to resolve.

Mapping:

Project Manager will cross-check maps, ensuring they have been accurately created, containing the correct reserve boundaries. A final shoot map will be created by HeliSurveys with all appropriate buffers, hazards, boundaries and other requirements in place, which are to be cross-checked by the marksman and the Project Manager or nominated Project Officer prior to daily flights commencing.

Buffer or no fly/shoot zones will be identified, being a 500m buffer around any houses in proximity to the operational area along with a 150m buffer along minor roads and 500m for a major road.

Any hazards or key points such as neighbours with stock to be managed/watched when approaching will be incorporated into operational maps.

Known hazards such as power-lines and towers will be identified on maps.

Detailed operational maps will be provided to the Aerial Marksman and pilot at least five working days prior to the operation for review and comment. Final versions will be provided to the marksmen and pilot in an electronic format for pre-flight familiarisation and operational use during the operation.

An iPad will be mounted for the marksmen and pilot for real time mapping of operations. If both devices fail/loses GPS function, operations will cease until real time mapping is restored.

A large-scale operational map (A1 or A2 size) will be produced for the operational area, allowing the team to review the area and plan accordingly at daily briefings as well as discuss areas with land managers.

Animal Welfare:
Shooting must be conducted in a manner which causes rapid death. This requires the use of appropriate shot placements, appropriate firearms and ammunition as described in the National Standard Operating Procedure (identified below).

When operating under TAAC, once a detection has been made with the thermal equipment the animal may be mustered into position (if required) to be confirmed by the camera operator and marksmen before it is engaged and shot.

Two members will confirm animals are dead before moving on (camera operator and shooter 2 or pilot and shooter 1). If there is any doubt additional shots will be delivered to ensure the animal(s) are dead, along with a fly-back procedure over the group.

When using the Clause 4(1)(a) , animals will only be engaged if the distance is 25m or less for discharge impact.

A second animal will not be targeted until the first animal is confirmed dead.

It is essential that a deliberate policy of 'overkill' be followed where a minimum of two shots are used per animal. That is, after an initial head/chest shot, another shot/s must be fired into the chest to ensure death.

If an animal is wounded by an initial shot, additional shot(s) are to be administered to ensure a quick death. Any wounded animal in a group will be killed immediately before further animals are targeted, with all targeted animals confirmed dead before continuing further with shooting operations.

In the unlikely event that an animal is wounded inside the operational zone and flees onto a neighbouring property (without an agreement in place) the animal must be pursued (where safe to do so) and killed (see *Activities –Aerial cull*).

If any reports are lodged regarding animal welfare concerns the NPWS Director, Regional Operations must be notified as soon as possible. On-site follow-up and investigation will be required to gather information and address the situation. The Project Manager/Project Officer will stop the operation if necessary so that the animal welfare matter can be resolved and investigated.

Furthermore, as this is a trial from DEW's perspective, if at any time the DEW marksman or any other team members are concerned about the animal welfare outcomes the flight will discontinue and the matter discussed. Further directions may be sought from the Director, Regional Operations if a resolution cannot be achieved between the respective parties.

Refer: DEW Standard Operating Procedure - Aerial Shooting of Feral Animals.
HeliSurveys SWMS 2 Shooter TAAC Operations
National Standard Operating Procedure: Aerial Shooting of Feral and Wild Deer

Firearms:
Wildlife Resources Australia

Clause 4(1)(a)

Wildlife Resources Australia Personnel to follow Firearms Go/No-Go Checklist.

DEW Aerial Marksman Team

Clause 4(1)(a)

Ejected shell casings must not interfere with the safe operation of the helicopter.

A second Clause 4(1)(a) will be carried on board the helicopter as a back-up in case of malfunction with either firearm.

During this trial the DEW marksman may be positioned behind the pilot and use the Clause 4(1)(a). This will only occur once the staff member has received a full induction on the safe use and handling of the Clauses 4(1)(a), having undertaken some practice on the ground and all members involved (pilot, contractor and staff) are satisfied and confident that the Clause 4(1)(a) can be used safely while in the air.

While in the air, if any member is not satisfied that the use of the Clause 4(1)(a) by the staff member is being delivered safely or humanely, they will immediately communicate their concerns and the operation will cease, with the shooters changing positions and/or firearms.

Refer: DEW Standard Operating Procedure - Aerial Shooting of Feral Animals
National Standard Operating Procedure: Aerial Shooting of Feral and Wild Deer

Aircraft type:
AS350 B2 helicopter (Squirrel) – a turbine powered helicopter with appropriate power for task with four participants for aerial shooting operations.

Fuel for aircraft will be provided by helicopter contractor and transported to nominated refuelling site(s).

Logistics:

Operations team	• Clauses 4(1)(a), 6(1) – Project Manager (PIRSA) • Clauses 4(1)(a), 6(1) - Project Officer/Ground Support (LCLB) • Clauses 4(1)(a), 6(1) - Project Officer/Ground Support (LCLB) • Clauses 4(1)(a), 6(1) - District Ranger – ULC • Clauses 4(1)(a), 6(1) - District Ranger – LLC • Clauses 4(1)(a), 6(1) – DEW Marksman • Clauses 4(1)(a), 6(1) - DEW Marksman • Clauses 4(1)(a), 6(1) – Pilot (HeliSurveys) • Clauses 4(1)(a), 6(1) – Thermal camera operator (HeliSurveys) • Clauses 4(1)(a), 6(1) – WRA Chief Marksman • Clauses 4(1)(a), 6(1) – WRA Marksman • Clauses 4(1)(a), 6(1) – WRA Marksman

Activities

While operating in the field, personnel will be stationed at the following locations:

Session 1: Clause 4(1)(a)

Session 4: Clause 4(1)(a)

All catering will be coordinated by the Project Manager. The Project Manager will liaise with marksman, helicopter contractors and staff in the lead-up to the operation, with final arrangements confirmed with participating staff at least one week prior to operations commencing.

All project participants to be on site prior to commencement of operations to receive full operational briefing. Time and location to be advised by Project Manager.

Aerial cull

TAAC activities will occur over two distinct periods:

- Session 1 (23 – 25 March)
- Session 4 (1 – 3 April or 2 - 4 April, depending on arrival of DEW marksman)

Flight runs and durations will vary throughout the operation dependent upon environmental conditions and the need for them to be suitable for TAAC operations. Daily operations will commence at dawn and finish by dusk.

Hours of operation/cull runs will be determined in consultation with the pilot and marksman, to ensure fatigue is being suitably managed.

All aerial operations will strictly adhere to the operational zones/boundaries as provided by spatial mapping services, confirmed in the operational briefing.

No culling activities can be undertaken outside the operational zones/boundaries, or deer pursued, on properties without an agreement in place. An exception to this is in the unlikely event that an animal is wounded inside the operational zone and flees onto a neighbouring property (without an agreement in place) outside of the operational zone before it can be killed. If this occurs the animal must be pursued (where safe to do so) and killed.

A dynamic risk assessment and evaluation of the surrounding area (power-lines, stock, people, cars, etc.) must be made by the aerial team prior to engaging the wounded animal outside the operational zones/boundaries. Once the wounded animal has been killed the Project Manager or nominated rostered Project Officer will be notified and they will contact the affected landholder and advise what has occurred. Once the animal is confirmed dead the aerial team will remove the carcass from the property.

Personnel

Use of contractors - Contractors from Wildlife Resources Australia (WRA) will be used as aerial marksmen alongside DEW marksmen. WRA marksmen have been contracted by PIRSA, and will be using their own Safe Work Method Statement (SWMS). DEW JSA and contractor SWMS will be reviewed by the project manager prior to operation commencing and discussed during briefings to ensure consistent approaches on safety.

Approval is granted by the Director, Regional Operations for the contracted marksman nominated in this plan to operate and use firearms on reserves in accordance with Regulations; 7, 19 and 23 of the *National Parks and Wildlife (National Parks) Regulations 2016* under the *National Parks and Wildlife Act, 1972*.

If a marksmen becomes unavailable/unwell to participate in the shoot a reserve marksman will take their place (if available). The reserve marksmen will be called upon only if appropriate, with their fatigue management taken into account with the operation paused until a marksman is available.

Data management:

The location and species of all animals that are culled will be recorded using a data logger operated by the pilot conducting the shoot. HeliSurveys custom built app records GPS locations, species, location, date, and time for every event recorded. Track waypoints are also recorded via the GPS receiver every two seconds to provide accurate track-logs for each flight.

Data will be formatted consistent with the minimum biological data requirements specified in the DEW Ecological Information Standards. It applies to all information assets, including electronic and physical data, information, documents, records, publications, maps and photographs. PIRSA will share all relevant data with the LCLB and DEW.

Thermal camera equipment will record the shooting process, aiding the operation, debrief and to inform any future operations. The footage recorded by the thermal camera and visual camera is owned by the SA Government (PIRSA) as written in the signed contract. The footage will be labelled as “Protected” under state government information classification and will be controlled by

the managers involved in the operation. Footage is only stored for a 3-day period after each daily operation, allowing a period for review if required. After 3 days it will be deleted by HeliSurveys.

Table 1: Data management throughout the control program

Role	Agency	Responsibility
Custodian	PIRSA	Data protection – Authorises the distribution of all data including GIS, photographs and maps.
Manager	PIRSA	Ensures quality of data – Acts as the primary contact for dataset & manages data throughout, from acquisition to distribution as directed by custodian. Ensures mechanisms exist to liaise between agencies.
Provider	Project team members (HeliSurveys)	Collect data and provide to respective agency managers/custodians.

Program	**Logistics**	
Key Roles and Responsibilities:	**Position**	**Responsibility**
Project Manager: Clauses 4(1)(a), 6(1) As Project Officers in Clauses 4(1)(a), 6(1) absence: Clauses 4(1)(a), 6(1) Clauses 4(1)(a), 6(1)		• Overall Project management • Procurement and contract management • Holding a pre operation meeting to familiarise those involved with Emergency Evacuation Plan and Emergency Response Plan and different organisations safety requirements (JSA/SWMS) • Holding a pre operation briefing • Final point for decision making Re: project longevity and daily go or no go of the operation. • Operational logistics – accommodation, meals, timing, daily operations, liaison with contractors, marksman and additional staff • Provision of ammunition • Provide appropriate georeferenced pdf maps • Development and management of Ops Plan, Communications Plan, reporting and logistics • Notifying landholders 72-hours prior to operations on their land • Flight following - SAR monitoring and ground/air communications • Management of contracted requirements of WH&S and approvals associated with CASA, helicopter operations • Incident Management and overall WH&S
Ground Support: Clauses 4(1)(a), 6(1) Clauses 4(1)(a), 6(1)		• Notifying neighbours two weeks prior to operations in the field • Operational logistics – timing, daily operations, liaison with contractors, marksman and additional staff • Daily data collation • Ground support • Communications
Lead Marksmen: Clauses 4(1)(a), 6(1) (DEW AMT) - Session 1 Clauses 4(1)(a), 6(1) (DEW AMT) - Session 4		• Management of WH&S and Animal Welfare associated within aerial culling operation • Liaise with Project Manager, pilot and marksman, with daily discussions regarding shooting operations, areas to treat, etc. • Undertaking shooting operations and confirm data collection
Marksman: Clauses 4(1)(a), 6(1) (WRA)- Session 1 Clauses 4(1)(a), 6(1) (WRA)- Session 4 Clauses 4(1)(a), 6(1) (WRA)- Session 4		• Undertakes shooting operations and data collection • WH&S and animal welfare associated with aerial culling operation • Participate in discussions regarding daily shooting operations
Helicopter Pilot:		• Pre-flight briefing • Undertake flying operations

Clauses 4(1)(a), 6(1) (HeliSurveys)	• Management of WHS associated with helicopter and aerial operations • Liaise with marksman, ground support and base • Data collection • Management of mapping and areas of operation in consultation with Project Manager and Lead Marksman
DEW Ground Support: Clauses 4(1)(a), 6(1) Session 1 Clauses 4(1)(a), 6(1) Session 4	• DEW reserve site management • Communication with DEW staff • Logistics/Liaising • Operation area signage
Thermal Camera Operator: Clauses 4(1)(a), 6(1) (HeliSurveys)	• Operate thermal camera equipment • Assisting in navigation and mapping data • Communication with marksman identifying and confirming target species • Assistance in directing pilot • Refuelling

Briefings:

- Project staff and pilots will be made aware of project aims, roles and responsibilities as well as operational details through a pre shoot briefing led by the Project Manager prior to commencing the operation.
- A pre-flight briefing will be conducted by the Helicopter pilot who will run through a full induction of helicopter operations and safety, along with processes involving the thermal camera and camera operator and two shooter operation.
- Sufficient time will be spent on the ground running through operational procedures, access and use of firearms, shooting position, communications while in the air, animal engagement, flight speeds, helicopter position/height during survey and shooting, etc., given the different shooting position and methodology to usual aerial shooting operations. Operations will not proceed until all participants are satisfied with their understanding and safety of all operation components.
- Daily briefings and debriefings will be held to ensure all team members are updated on progress and new developments, being aware of the following day's operations. This also allows an opportunity to highlight operational or safety issues and anything else that needs to be addressed prior to the next session.
- Any buffer or exclusion zones and any hazards will be clearly identified during the pre-shoot briefing, as well as being incorporated onto the maps (iPad) used by the pilot and aerial marksman.
- Hard copy maps will be available to aid with daily briefings and confirm target areas.
- In addition to the daily debriefings, a debrief will be held at the completion of the operation so that any learnings can be addressed and applied prior to any future operations.
- Any media enquiries will be directed to the A/General Manager, Invasive Species Unit, Brad Page who will discuss with the Director Regional Operations prior to determining a direction and the Limestone Coast Landscape Board General Manager will be advised

Key Contacts:

- AusSAR (Aviation) Rescue Coordination Centre –1800 815 257
- Clauses 4(1)(a), 6(1) Project Manager, PIRSA: Clauses 4(1)(a), 6(1)
- Project Officer/Grnd Support - Clauses 4(1)(a), 6(1), Operations Manager, (LCLB) – Clauses 4(1)(a), 6(1)
- Project Officer/Grnd Support - Clauses 4(1)(a), 6(1), Clauses 4(1)(a), 6(1) (LCLB) - Clauses 4(1)(a), 6(1)
- Clauses 4(1)(a), 6(1), Director, Regional Operations, NPWS – Clauses 4(1)(a), 6(1)
- Clauses 4(1)(a), 6(1), A/General Manager – Invasive Species, PIRSA – Clauses 4(1)(a), 6(1)
- Clauses 4(1)(a), 6(1), General Manager, Limestone Coast Landscape Board – Clauses 4(1)(a), 6(1)
- Clauses 4(1)(a), 6(1), (DEW Marksman) – Clauses 4(1)(a), 6(1)
- Clauses 4(1)(a), 6(1) (DEW Marksman) – Clauses 4(1)(a), 6(1)

- Clauses 4(1)(a), 6(1) HeliSurveys pilot – Clauses 4(1)(a), 6(1)
- Clauses 4(1)(a), 6(1) HeliSurveys thermal camera operator – Clauses 4(1)(a), 6(1)
- Clauses 4(1)(a), 6(1) (Chief Marksman, Wildlife Resources) - Clauses 4(1)(a), 6(1)
- Clauses 4(1)(a), 6(1) (Marksman, Wildlife Resources) - Clauses 4(1)(a), 6(1)
- Clauses 4(1)(a), 6(1) (Marksman, Wildlife Resources) – Clauses 4(1)(a), 6(1)
- National Parks – Regional Duty Officer – Clauses 4(1)(a), 6(1)
- Clauses 4(1)(a), 6(1) - Upper LC Senior Ranger - Clauses 4(1)(a), 6(1)
- Clauses 4(1)(a), 6(1) – Upper LC District Ranger – Clauses 4(1)(a), 6(1)
- Clauses 4(1)(a), 6(1) - Lower LC District Ranger – Clauses 4(1)(a), 6(1)
- Kingston Soldiers Memorial Hospital – (08) 8767 0222
- Keith Hospital – (08) 8755 1555
- Naracoorte Hospital – (08) 8762 8100
- Meningie Hospital – (08) 8575 2777
- SA Police call centre – 131 444
- CFS/AMBULANCE/SAPOL – 000
- Naracoorte SAPOL – (08) 8762 0466
- Keith SAPOL – (08) 8755 1211
- Kingston SAPOL – (08) 8767 2009
- Lucindale SAPOL – (08) 8766 2200