Goat Management Plan – South East SA

Natural Resources South East

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Government of South Australia
Primary Industries and Regions SA

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Summary

Feral or escaped goats are an ever increasing threat to many agricultural industries and natural environments. Presently feral goats exist in small isolated populations in the northern and western hundreds of the South East in close association with native vegetation areas.

Goats are identified as a high priority issue in the SE Pest Management Strategy of 2009 due to their high potential impacts upon agricultural industries and natural environments and their current limited distribution. This rating indicates that farmed and feral goats should be actively managed to prevent further establishment of populations within the region.

Active management of feral goats presents a number of challenges including understanding their true distribution and density in the region and gaining landholder support for control programs.

This management plan has been developed under the Landcare funded Herbivore Threat Abatement project and aims to ensure the long term removal of feral goats from the South East region.

This management plan contributes to the following targets from the South East Natural Resources Management Plan

- Goal A - Healthy landscapes supporting high value ecological systems
    - Target A.1 Improving native vegetation
    - Target A.5 Managing priority habitats
    - Target A.9 Managing threatened species
- Goal C - Resilient industries taking responsibility for sustainable use and management of natural resources
    - Target C.2 Reducing key invasive species
    - Target C.8 Managing pests
- Goal D – Good governance and effective partnerships for natural resources management.
    - Target D.1 Responding to new pests

This management plan addresses and supports the following Goals and Objectives of the South East Pest Management Strategy;

Goal 1. An informed community proactively undertaking pest management activities.

Goal 3. Effective management of established pest species.

Objectives;

1. Effectively implement the animal and plant control provisions of the NRM Act 2004
2. Ensure early detection of and rapid response to new incursions of pest animals
3. Prevent the spread of established pest plants and pest animals within the region
4. Apply a risk assessment approach to pest plant and pest animal management
5. Apply a continuous improvement approach to all aspects of pest plant and pest animal management implemented by the SE NRM Board
6. Maintain a regional pest management database
7. Support State and National Biosecurity programs

Background

Domestic goats were introduced to South Australia as livestock in 1836. From here some were abandoned, deliberately released or escaped to establish feral herds in wide range of habitats across the state. Overgrazing by goats has had detrimental impacts on both arable land and natural environments.

Legislation

The following legislation is relevant to goat management and impacts on goat management objectives developed in this strategy.

Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). Competition and land degradation by feral goats is listed as a key threatening process under the *EPBC Act*. The Commonwealth Government, in consultation with the State and Territory Governments, has developed the Threat Abatement Plan for Competition and Land Degradation by Feral Goats (Commonwealth of Australia, 2007a).

Livestock Act 1997. An act to regulate matters relating to registration and disease control of livestock.

The Natural Resources Management Act 2004 Goats are listed as declared species **(Class 14)**

The following sections of the NRM Act apply to goats in the South East NRM region:

179	Must not release the animal in the region
182 (3)	Land owner must take prescribed measures for the control of the animal on their land

Where a captured feral goat has been held in captivity for less than 3 months the following sections apply in the South East NRM region:

175 (1) (3)	Cannot bring the animal into the region Must not spread animal to areas where it doesn't already exist
176 (1)	Must not keep an animal in your possession in the region
179	Must not release the animal in the region
182 (3)	Land owner must take prescribed measures for the control of the animal on their land

The following sections of the NRM Regulations apply to goats in the South East NRM region:

26 (2) (3)	If goats are on property with consent they must be confined and permanently identified in a manner determined by the Chief Officer If goats are on property without consent they must be captured and removed from the land within 6 weeks or destroyed
28 (2)	If goats are on property without consent, the landholder must not destroy sell or remove them if they believe them to be owned by another person until the owner has been given the opportunity to recover them.

Detailed information on serving legal notices and minimum notification times are available in section 28 of the Natural Resources Management (General) Regulations 2005.

Determinations made by the Chief Officer in relation to goats under Regulation 26(2) of the Natural Resources Management (General) Regulations 2005 can be found on the PIRSA website.

Goats in the South East

Goats were introduced into Australia with the First Fleet in 1788 and now feral goats occur in all states and territories. Goats arrived in South Australia with the first settlers in 1836 and angora and cashmere goats where used to establish fibre industries from 1860's. Adult goats weigh between approximately 30kg (female) and 70kg (male). There are a variety of breeds with a range of colours, horn shapes and hair lengths.

Distribution & Habitat

Feral goats are uncommon in the South East region, and while precise numbers of populations are not known, anecdotal evidence and observations indicate that there are small, isolated herds existing in the north western part of the region. These populations appear to be closely associated with large areas of intact native vegetation e.g. State and national conservation areas, private heritage agreements and other native vegetation patches, see Figure 1.

Since goats are generalist herbivores and can survive on low nutrient food resources, they have the potential to establish across all habitats found within the South East region.

Domestic goats have a place in Australian primary industry but it is recognised that goats have a demonstrated capacity to escape and survive in the wild. Proper management can ensure that domestic goats are kept in captivity without threat to the environment or other primary production. The number of domestic goats in South Australia has increased in recent years, also contributing to the feral population through occasional escapes and deliberate releases.

There are presently 141 PIC (Property Identification Code) registrations (data provided by Biosecurity SA, November 2016) across the region that maintain and manage peri-urban, small scale, non-commercial and commercial herds. See Table 1 and 2 below for details. According to anecdotal evidence, a very small number experience issues with escaping goats. The indicative location of farmed goats in the South East is shown in Figure 2.

Table1 – PIC's registered for goats summarised by herd size

Number of animals registered	Number of PIC's
Unknown	9
Less than 10 animals	79
10- 50 animals	40
51-100 animals	5
Greater than 100	8

Table 2 – PIC's registered for goats summarised by production system

Production System	Number of PIC's
Unknown	42
Commercial Dairy	2
Feral	1
Other	8
Fibre	8
Meat	66
Meat & Other	1
Meat & Fibre	11
Meat & Fibre & Commercial Dairy	1
Meat & Fibre & Other	1
Grand total	**141**

Figure 1 – Feral Goat distribution and density in the South East region

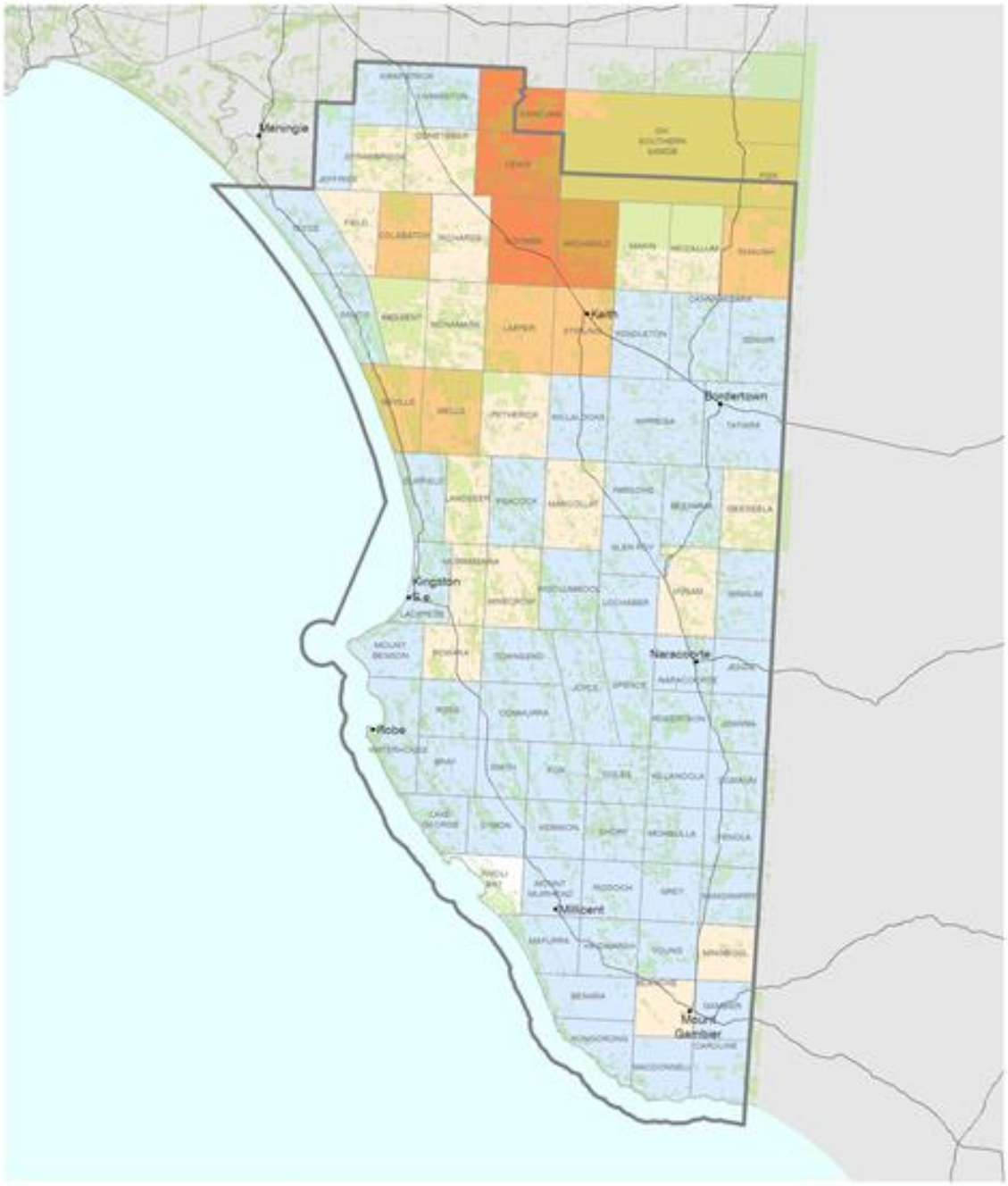
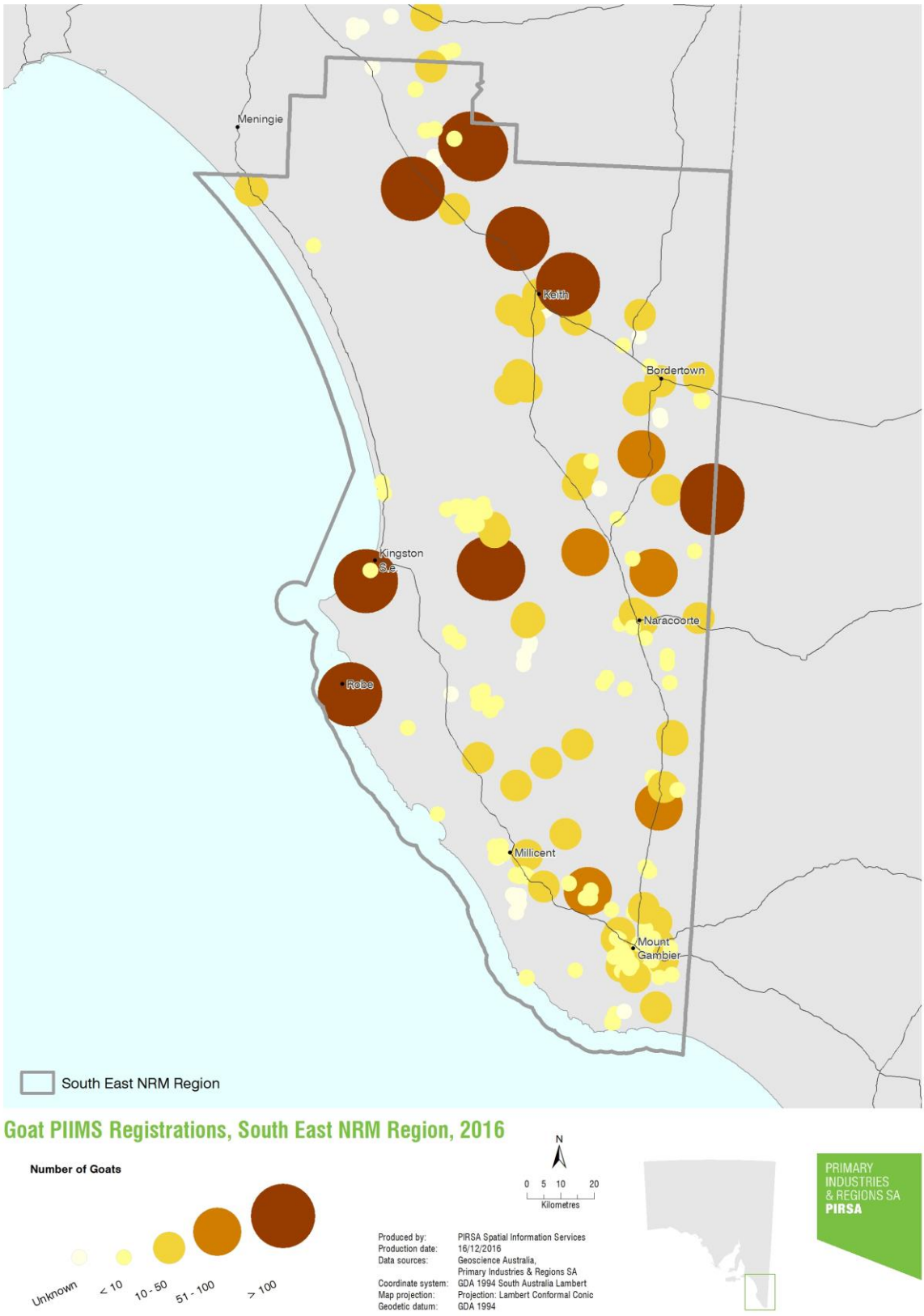


Figure 2 – Farmed goat indicative distribution in the South East region



Dispersal

Unmanaged herds and individuals are capable of long distance dispersal, however providing they have sufficient food, water and shelter resources, they tend to remain relatively sedentary with small overlapping home ranges of approximately 1 square kilometre.

Movements of goat populations across the South East region are not well known, much of the information concerning distribution and abundance is based on landholder or public sightings and ad-hoc reporting.

Reproductive output and season

Feral goat populations can increase by up to 50% in one year, resulting in significant numbers if left unchecked. Goats are able to breed at a young age, they have an extended breeding season depending on conditions, can conceive while still lactating and can have more than one offspring per birth. Goats have the ability to breed year round providing there is access to a regular food supply, however most conceptions occur when day length is shortening i.e. Dec to June.

Goats have the potential to breed twice within year, with a gestation period of approximately 150 days. Females may become pregnant in their first year and they can become pregnant soon after giving birth as lactation does not stop oestrus (Parkes *et al.* 1996).

Diet

Goats are generalist herbivores, which obtain the large proportion of their diet from grasses and herbs. They may consume plant species that are bitter, prickly, and unpalatable and avoided by other livestock. The South East region provides ample food and water supplies.

Disease

Many diseases of livestock are known to be carried by feral goats. This has obvious biosecurity implications for livestock producers as they can pose as reservoirs and potentially exacerbate an outbreak of exotic disease such as foot and mouth disease. Goats are known carriers of the disease Q fever, which is a zoonosis i.e. has the ability to be transferred to humans, thus infected feral goats may pose a public health problem.

Predators

Feral goats are known to be predated upon by wild dogs, foxes (main predator of kids in eastern Australia), wedge-tailed eagles and feral pigs. In SA's south east region wild dogs/dingoes, present around the Ngarkat CP region and foxes, region wide, are the principle predators. Uncoordinated and opportunistic hunting does occur within the region which further impact upon goat numbers.

Impacts

Goats are recognised as a "key threatening process" under the Environment Protection and Biodiversity Conservation Act 1999. Their impacts upon native and agricultural environments are well documented. As a hoofed animal, goats may contribute to soil erosion in areas of high goat traffic in both agricultural and environmental systems.

In agricultural systems, goats have the potential to reduce carrying capacity through competition with livestock for food and water resources, reduce productivity of crop and pastures. They contribute to over-grazing and fence damage. Feral goats are a known parasite risk to sheep and a potential exotic disease risk.

Feral goats are gregarious animals whose tendency to “mob up” intensifies their impacts on the environment. They damage native vegetation through browsing both existing vegetation and reduce recruitment of many native species by preventing regeneration of seedlings and reduction of seed bank. They indirectly impact on native fauna populations through competition for resources and localised effects of goat campsites. Their browsing can impact upon food and shelter resource for native icon species such as the mallee fowl, *Leiopoa ocellata*.

Goat Management in South Australia’s South East

Management Principles

Management principles for goats include; no management, crisis management, commercial management, strategic management and eradication (Parkes et al. 1996).

To date the management principle typically employed in the South East region is ‘crisis management’, whereby there is no clear objective and control is undertaken when populations build up and operational resources are available. Crisis management has little long term benefit for agricultural and natural environments hence will not be considered further.

No management principle does not occur, as it implies that feral goats are not harmful to their environment and the economy and that they have reached carrying capacity. Opportunistic harvesting, hunting and community attitudes ensure that this principle will never be explored.

Commercial management may be feasible, however the lack of significant populations and community attitudes of ongoing environmental and agricultural impact do not support this management option.

This leaves strategic management and eradication principles.

Local eradication is reliant on many factors to succeed. Political and social commitments must be aligned. All feral and unmanaged goats must be targeted, and must be destroyed at a rates faster than recruitment (natural and escapes). Goats can be monitored at very low densities and the high costs of eradication can be justified.

Strategic management is employed where local eradication is not feasible but there is still an emphasis toward coordinated effort to reduce and maintain goat density and damage to very low levels.

Both eradication and strategic management principles may employ control techniques such as;

- Mustering via aerial and ground,
- Trapping at water - permanent and mobile yards
- Shooting via aerial and ground
- Judas goats
- Fencing

Extensive descriptions of control techniques to manage goat populations and the merits and consequences associated with each are not addressed in this management plan as they are well documented. Multiple techniques maybe required to meet the each of the regional objectives.

Regional Management Targets

The regional objectives for goat management in the South East contribute to the Regional NRM Plan targets;

- Goal A - Healthy landscapes supporting high value ecological systems
    - Target A.1 Improving native vegetation
    - Target A.5 Managing priority habitats
    - Target A.9 Managing threatened species
- Goal C - Resilient industries taking responsibility for sustainable use and management of natural resources
    - Target C.2 Reducing key invasive species
    - Target C.8 Managing pests
- Goal D – Good governance and effective partnerships for natural resources management.
    - Target D.1 Responding to new pests

The South East NRM Board has adopted a regional pest animal management policy for feral goats which sets the control objective at 'destroy'. This target recognises the high priority that feral goats have under the regional pest risk assessment and also acknowledges the challenges in eradicating feral goats.

The aims of this policy are:

- To protect agriculture and the environment from the impacts caused by feral goats
- To destroy all known feral goat populations in the South East.

To meet the targets outlined above, the following objectives have been developed for the management of goats:

1. **Identify the extent of feral goat distribution and density in the South East.**
2. **Increase public and landholder awareness about the impacts of feral goats and landholder responsibilities in relation to identification and management of domesticated goats.**
3. **Improve the understanding of the ecology and impacts of feral goats in the south east and identify important areas to be protected from goats.**
4. **Implement effective control techniques for the management of feral and unmanaged goat populations.**

Implementation of these objectives is outlined below.

Regional Priority Actions for the SE NRM Board

Objective	Outcome/Output	Key Responsibility	Timing of milestones	Milestones
1. Identify the extent of feral goat distribution and density in the South East.	• Establish a goat population monitoring program to measure success of control operations	NRSE – Upper South East & Lower South East District Management teams	2016 – 2021	1.1. Meetings with key stakeholders to discuss distribution 1.2. Set up and publicize feral goat scan app for recording sightings 1.3. Map distribution of feral goats and confirm current records 1.4. Implement monitoring sites to identify environmental impacts of goats on SE vegetation 1.5. Monitor changes in plant composition and abundance 1.6. Report 1.7. Assess value of aerial survey 1.8. Investigate use of remote cameras 1.9. Investigation of density using scat counts 1.10. Investigate cost per unit effort 1.11. Methodology developed for presence/absence in low densities 1.12. Methodology developed to assess control success 1.13. Annual assessment of success

Objective	Outcome/Output	Key Responsibility	Timing of milestones	Milestones
2. Increase public and landholder awareness about the impacts of feral goats and landholder responsibilities in relation to identification and management of domesticated goats.	• Ensure the re-domestication of feral goats in the South East region is in accordance with NRM Regulations • Ensure appropriate identification and confinement of farmed goats in accordance with the NRM Regulations.	NRSE Board & District Managers NRSE – Upper South East & Lower South East District staff	2016 – 2021	2.1 Displays at key locations shows & farmer events 2.2 Provide regular updates on progress toward achieving objectives of the management plan 2.3 Discussions with all goat owners on issues relating to domestic goat biosecurity 2.4 All properties inspected and fences checked bi-annually 2.5 Protocol in place to recover farm escapes 2.6 Encouragement of farmers to report escapes 2.7 Process developed to identify any new owners of domestic goats and provide information on the program and the responsibilities of domestic goat owners 2.8 Impose penalties on goat owners who allow domestic goats to stray and recover costs from the goat owners for the recapture or

Objective	Outcome/Output	Key Responsibility	Timing of milestones	Milestones
				destruction of escaped goats.
3. Improve the understanding of the ecology and impacts of feral goats in the south east	• Identification of important sites to be protected from feral goats. • Seek external funding for projects relating to feral goat control, which will protect agriculture and natural environments.	NRSE – Upper South East & Lower South East District Management teams	2016 – 2021	3.1 Radio collar goats and collect information on group size & composition, area covered, movements, and habitat use 3.2 Collect information on diet 3.3 Collect information on reproductive activity, weights, age & condition 3.4 Compile & report on the above
4. Implement effective control techniques for the management of feral and unmanaged goat populations.	• Enforce control of feral and unmanaged goat populations in priority areas • Develop and implement a regional feral goat control plan that targets control in priority areas.	NRSE – Upper South East & Lower South East District staff	2016 – 2021	4.1 Enforce relevant sections of the NRM Act (2004) if necessary. 4.2 Establish goat management landholder groups 4.3 Investigate and implement where necessary the use of traps, mobile & permanent at relevant sites. 4.4 Seek involvement from relevant shooting groups to support ground culls. 4.5 Coordinated cull program via air and ground in priority areas

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