

Greater Sydney Regional Strategic Pest Animal Plan **2018 - 2023**





Published by Greater Sydney Local Land Services

Greater Sydney Regional Strategic Pest Animal Plan 2018-2023

ISBN: 978-0-6480418-4-9

First published 1 July 2018. www.lls.nsw.gov.au/pestplan

© State of New South Wales through Local Land Services, 2018.

Disclaimer: The information contained in this publication is based on knowledge and understanding at the time of writing on 1 July 2018. However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of Local Land Services or the user's independent adviser.

Contents

Minister's Foreword.....	4
Executive Summary.....	5
1. Introduction.....	6
1.1 Overview	6
1.2 Purpose of the plan	6
1.3 What is considered a pest animal?	6
1.4 Managing native animals.....	6
1.5 Framework for Pest Species	7
1.6 Roles and responsibilities	8
1.7 Incursion Management and Alert Species.....	8
2. Guiding principles of pest animal management.....	11
3. Our region	12
4. Managing our pest animals	15
5. Our priority pest species.....	16
5.1 Wild Dogs	17
5.2 Feral Pigs	21
5.3 Red Fox	25
5.4 Wild Rabbit	28
5.5 Wild Deer (Chital, Fallow, Red, Rusa and Sambar species)	31
5.6 Cats.....	36
5.7 Feral Goats	38
5.8 Indian Myna	40
5.9 Common Carp.....	41
5.10 Other Non-Indigenous Animals.....	41
6. Measuring success and continuous improvement.....	43
6.1 Key performance indicators	43
6.2 State-wide KPIs.....	44
6.3 Measuring performance.....	44
6.4 Plan review	44
7. The <i>Biosecurity Act 2015</i>	45
8. Further information.....	46
9. List of Abbreviations	48
References	49
Appendix 1. Prioritisation Process.....	50
Appendix 2. Greater Sydney Regional Pest Animal Programs - 2018.....	51
Appendix 3. Case Studies.....	52

Minister's Foreword

I am pleased to announce the Greater Sydney Regional Strategic Pest Animal Management Plan. This plan is a vital community tool, as it provides a strategic regional approach to improving the coordination and delivery of on ground, nil tenure pest animal management activities for terrestrial vertebrate and freshwater aquatic pest species in NSW.

The Greater Sydney Regional Strategic Pest Animal Management Plan is an excellent example how local communities can work together to protect the environment, community and economy from the negative impacts of pest animals and to support positive outcomes for our landscapes and ensuring we maintain a bio-secure environment.

The Greater Sydney Regional Strategic Pest Animal Management Committee represents major land uses and relevant economic, environment and community representatives for each region. The committee delivers a collaborative approach to setting regional priorities and is integral to the ongoing effective delivery of pest animal management outcomes in the region.

This plan is a product of extensive collaboration and engagement across numerous stakeholders involved in pest animal management. It will continue to grow and evolve with the changing environment and is an excellent framework to contribute to the delivery of improved coordinated pest animal management in NSW.

A handwritten signature in blue ink, appearing to be 'Niall Blair', is positioned above the minister's name.

The Hon. Niall Blair MLC Minister for Primary Industries,
Minister for Regional Water, and Minister for Trade and Industry

Executive Summary

The Greater Sydney Local Land Services region is a highly complex landscape. With a multicultural population of over 5 million people and an area spanning 12,474 square kilometres, the region includes extensive bushland in conservation reserves and World Heritage areas, densely urbanised cities and coastal waterways along with a large number of small peri-urban holdings many with a mix of livestock, plant enterprises and natural areas undergoing regeneration. In addition it remains an area of very significant agricultural production with a high proportion of key industries such as fresh vegetables and poultry sourced from within the region. It is also recognised as the gateway into NSW for a huge number of people and products which places it at high risk for new incursions of pests and diseases.

Pest animal species within the region negatively impact biodiversity, agricultural production, the economy and the community. The most significant pests in the region include wild dogs, feral pigs, red foxes, wild rabbits, wild deer and cats. Goats, pest birds and introduced fish are also significant pests in parts of the region. These listed pests are present in varying distribution and abundance within the region.

The Greater Sydney Regional Strategic Pest Animal Management Plan (RSPAMP) focuses on managing pest animals and aligns with the *NSW Biosecurity Strategy 2013-2021* to:

- Improve community engagement in biosecurity (including pest animal) management
- Improve identification, diagnostic, surveillance, reporting and tracing systems for pest animals
- Increase numbers of well trained and resourced people.

It does not deal with overabundant native animals which are not within the scope of this plan.



1. Introduction

1.1 Overview

- The RSPAMP outlines how Government, industry and the community will work together and share the responsibility to prevent, eradicate, contain and/or manage pest animals in terrestrial and freshwater aquatic environments across the region.
- 'Biosecurity' provides protection from the negative impacts of animal and plant pests and diseases.
- 'Biosecurity risk' is any risk that threatens this protection.
- The economic impact of wild rabbits, carp, feral pigs, red foxes, wild dogs, feral goats and introduced birds has been estimated at \$170 million in NSW.
- Under the *NSW Biosecurity Act 2015* all community members have a general biosecurity duty to prevent, minimise or eliminate any biosecurity risk. The general biosecurity duty is a principle that can be used by the community, landholders, Government and industry to implement practice behaviours to achieve effective pest animal management.

1.2 Purpose of the plan

The overall purpose of the RSPAMP is to work together to protect the environment, community and economy from the negative impacts of pest animals to support positive outcomes for biosecurity and sustainable landscapes. The plan supports regional implementation of the *NSW Biosecurity Act 2015* and NSW Biosecurity Strategy and is reflective of key aligning themes including:

- Improved community engagement in biosecurity management
- Improved identification, diagnostic, surveillance, reporting and tracing systems for pests, diseases and weeds.
- Increased numbers of well trained and resourced people

This plan is one of eleven RSPAMPs across NSW. It presents a clear vision by identifying regional priorities for pest animal management and outlines how Government agencies, community groups and individual landholders will share responsibility and work together across land tenures to prevent, eradicate, contain and manage the impacts of pest animals.

RSPAMPs provide guidance on how both public and private land managers meet their general biosecurity duty. They identify key commitments for pest animal management activities over the life of these plans.

1.3 What is considered a pest animal?

Under the *NSW Biosecurity Act 2015*, pest animals are not defined by species. Pest species can be considered as any species (other than native species) that presents a biosecurity threat. Whilst the Act does not define pest animals, there are specific activities that are permitted under the Biosecurity Order (Permitted Activities) that would otherwise be prohibited (such as keeping exotic animals in captivity).

It is the responsibility of individuals to ensure they discharge their general biosecurity duty to manage the biosecurity risks posed by pest animals. The *Biosecurity Regulation 2017* will outline mandatory measures for pest animal management in NSW. General control and management of pest animals as outlined in this plan is considered a mechanism for individuals to discharge their general biosecurity duty. Landholders and community members should work with the other stakeholders identified in this plan to ensure ongoing implementation of the most effective pest animal management practices across all land tenures.

1.4 Managing native animals

Native species are protected by law in NSW and are not addressed in RSPAMP. Issues associated with managing the impacts and overabundance of native species (such as kangaroos, emus, wombats, possums and problem birds) should be addressed separately in consultation with National Parks and Wildlife Service (NPWS) and having regard to the regulatory requirements of the *Biodiversity Conservation Act 2016*.

Non-lethal methods may include exclusion netting, fencing, gating, and olfactory devices. Where it is necessary to use lethal methods such as shooting to destroy native animals because they are a threat to human safety, damaging property and/or causing economic hardship, the NPWS can issue a licence to harm protected native animals under the *Biodiversity Conservation Act 2016*. For further information visit <http://www.environment.nsw.gov.au/wildlifelicences/OccupierLicences.htm>

1.5 Framework for Pest Species

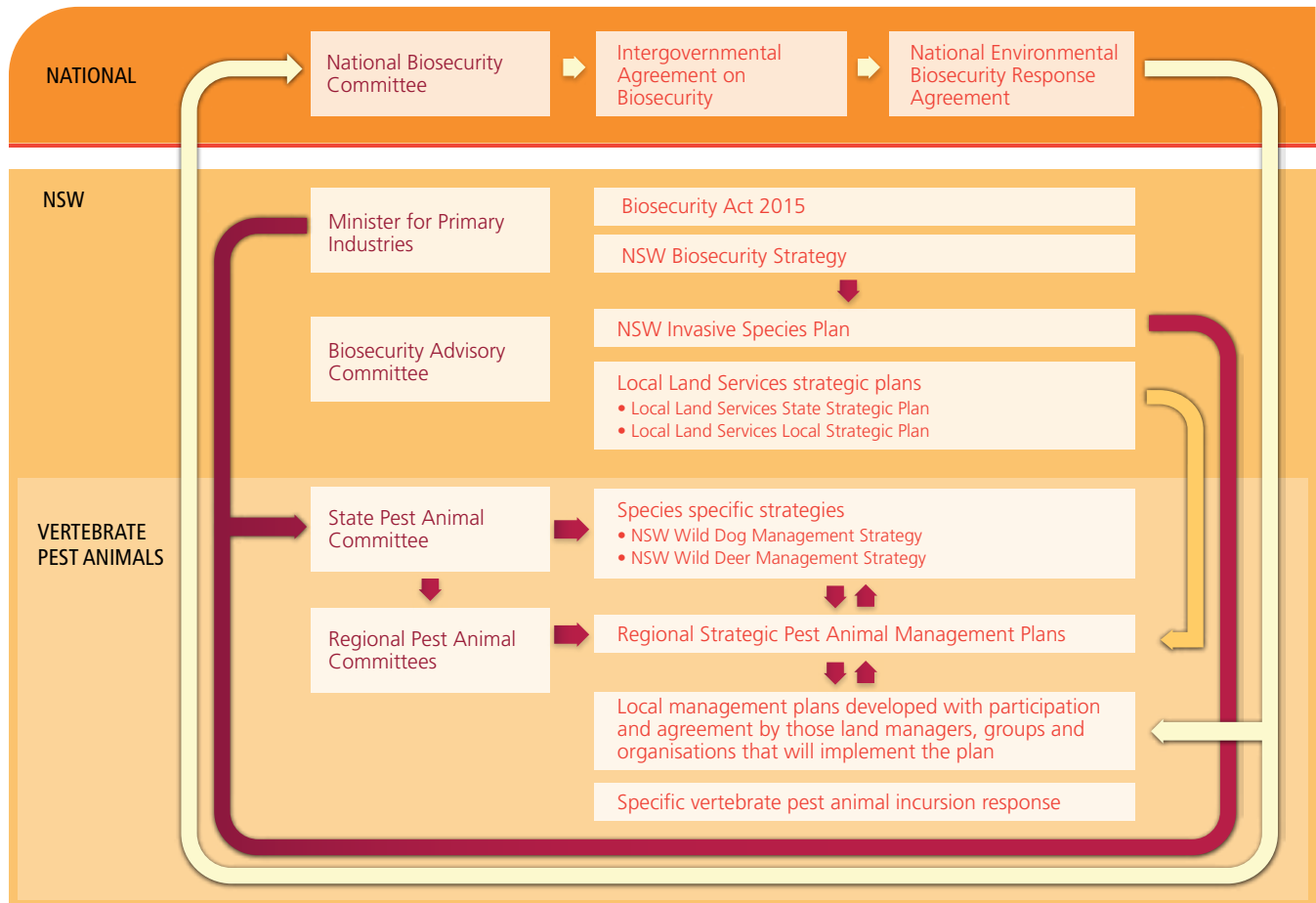


Figure 1.1: The NSW Biosecurity framework for pest species in NSW



1.6 Roles and responsibilities

- Under the *Biosecurity Act 2015* framework, biosecurity is a shared responsibility where Government, industry and the people of NSW work together to protect the economy, environment and community from the impacts of pest animals.
- Public, private and Aboriginal Land Managers all have a shared and equal responsibility to eliminate and minimise biosecurity risks across land in NSW.
- A key focus of the RSPAMP is to encourage engagement and participation across all land tenures to enhance the participation and delivery of coordinated pest animal management activities for improved outcomes. Where cross-boundary pest management issues arise, LLS boards are the appropriate bodies to engage with to resolve them.
- Government plays a key role in coordination and regulation for pest animal management under the legislative framework. NSW DPI has a lead role in managing terrestrial and freshwater aquatic pest incursions. Local Land Services supports the delivery of pest animal management activities and also have a regulatory role under the *NSW Biosecurity Act 2015*. The Office of Environment and Heritage (OEH) is responsible for managing over 870 National Parks and is the lead agency for wildlife conservation in our region. Local Government also plays a significant role in pest management and has regulatory control of weeds. Over 1000 Landcare, Bushcare, Aboriginal and specific function groups are seen as highly important across our region, supporting biodiversity outcomes and reporting new incursions and surveillance of pest animals.

The following outlines the roles and responsibilities of key stakeholders in the delivery of this role of the Regional and State Pest Animal Committee in the delivery of the RSPAMP. For more information on key roles and responsibilities in pest animal management, please refer to the *Invasive Species Plan 2017-2021*.

State Pest Animal Committee

The State Pest Animal Committee (SPAC) is responsible for overseeing a consistent approach to the ongoing operation of RPACs and development of tenure neutral RSPAMPs across the State. SPAC oversee key policy and strategy documents to guide pest animal management outcomes across the state.

Regional Pest Animal Committees

Regional Pest Animal Committees (RPACs) facilitate tenure neutral strategic planning and coordination for priority pest animal management programs in each Local Land Services (LLS) region. RPACs have an important role to play in the delivery of the RSPAMP through promoting land manager and general community involvement in detecting and reporting sightings of new or 'unusual' animals in the local area as well as managing established pest animals. RPACs will play an important role in the ongoing periodic review and adaption of the plan as required.

1.7 Incursion Management and Alert Species

Land managers and community members play a major role in reporting any unusual sightings of pest animals in the region.

We need to work together to ensure early detection and awareness of new incursions and to ensure alert species can be managed swiftly and effectively. It is important the community remain vigilant and report any unusual sightings to ensure a rapid management response.

The *NSW Biosecurity Act 2015* outlines species that are prohibited from being kept in NSW. Below is a list of some alert species for the region. An extensive list of alert species for the state can be found at <https://www.legislation.gov.au/Details/C2017C00303>.

ALERT SPECIES FOR GREATER SYDNEY REGION

Phone the Invasive Plants and Animals Enquiry Line: 1800 680 244



Cane toad - <http://www.environment.nsw.gov.au/pestsweeds/CaneToads.htm>



African hedgehog – <https://www.dpi.nsw.gov.au/animals-and-livestock/nia/african-hedgehog>



Boa constrictor - <https://www.dpi.nsw.gov.au/animals-and-livestock/nia/boa-constrictor>



American corn snake - <https://www.dpi.nsw.gov.au/animals-and-livestock/nia/american-corn-snake>



Red-eared slider turtle – <https://www.dpi.nsw.gov.au/animals-and-livestock/nia/red-eared-slider-turtle>



Veiled chameleon - <https://www.dpi.nsw.gov.au/animals-and-livestock/nia/veiled-chameleon>



Hog deer – <https://www.dpi.nsw.gov.au/biosecurity/vertebrate-pests/pest-animals-in-nsw/wild-deer/wild-deer>

The following mechanisms can be used to report unusual situations in the region:

- Complete the Report an unusual animal sighting form or;
- Phone: 1800 680 244
- Email: invasive.species@dpi.nsw.gov.au

For species that are yet to become widely established in NSW, the initial response to incursion reports is managed through consultation between DPI, LLS and OEH. Where species are widely established in NSW but have spread into a new region, Local Land Services and the RPAC will consider whether local eradication or containment should be attempted.



2. Guiding principles of pest animal management

The following principles should be considered and implemented by all community, industry, landholders and other stakeholders in pest animal management.

Be alert

Monitor and report sightings of any species you have not seen in your area before. Prevention and early intervention from the community is important to avoid the establishment of new pest animal species

Work together and participate

Pest animal management is a shared responsibility between landholders, community, industry and Government and requires a coordinated approach across a range of scales and land tenures.

Be committed

Effective pest animal management requires ongoing commitment by land managers, community, Government and industry. Those that create the risks associated with pest species and those that benefit from the pest animal management outcomes should help to minimise impacts and contribute to the costs associated with management

Stay up-to-date

Community, industry, government and landholders should stay up-to-date with new information to ensure that best practice pest animal management activities are employed to reduce pest animal impacts in a way that is as safe, effective, target-specific and humane as possible.

Cost of pest animal management

The cost of pest animal management should be borne by those who create the risk and those who benefit from its management. Governments may co-invest where there is a net public benefit from any such intervention.

3. Our region

The Greater Sydney region is a highly complex physical and social landscape (Figure 3.1-3.2). With a multicultural population of over 5 million people and an area spanning 12,474 square kilometres, the region extends from extensive World Heritage areas, densely urbanised cities and coastal waterways through to rural lands, peri-urban and urban fringes and is recognised as the gateway into NSW for new incursions. Accordingly, pest animal management needs to be tailored to meet the unique challenges of this environment such as the multicultural diversity of our region's population which has its benefits and challenges when engaging with the broader community.

Pest species such as wild dogs, red foxes, rabbits, feral pigs, wild deer, goats, pest fish and pest bird species are present, persisting in varying concentrations across the different landscapes, with many listed as key threatening processes under the *NSW Biodiversity Conservation Act 2016*.

Pest species negatively impact biodiversity, agricultural production, the economy and the community through access to export markets, tourism, human health, biodiversity including threatened species, weed dispersal, competition with native animals, crop/pasture damage, damage to cultural heritage, damage to fences, predating on livestock, being a public nuisance and causing safety issues.

Urban areas

The highly urbanised areas of the region are estimated to total 4,064 square kilometres, which translates to a density of 1,237 persons per square kilometre. Despite this very high human population, pest species occur across this landscape including foxes, rabbits, cats and pest birds. Furthermore, there is a high risk of new incursions from international/domestic travel into the region and the release of exotic pets such as corn snakes, which become too large for their enclosure and are no longer wanted. Greater Sydney Local Land Services works closely with Local Government who facilitates regional groups such as Sydney North and South Vertebrate Pest Committees and other authorities in these areas to minimise pest animal impacts.

Peri-urban areas

The regions agricultural land is being increasingly subdivided into smaller holdings many of which are owned by people with very little knowledge of pest management and other biosecurity risks. In addition a high proportion of urban and peri-urban residents travel widely both in Australia and overseas greatly increasing the risk of introduction of new pest animals. Further these properties have a high proportion of absentee landholders or people with full-time jobs off property which further increases the risk. These issues, coupled with the impact of climate change and emerging diseases, mean that the biosecurity risk for the region continues to rise. Pest animals impacting on these areas include foxes, rabbits, feral pigs and those which are increasing such as wild deer and wild dog. Traditional techniques for control of pest animals in are constrained by legislative rules focused on public and pet animal safety which restrict the use of many control options in urban and peri-urban areas. However local groups (such as bushcare networks), local government controls on companion animals and many human created boundaries also provide opportunities to use new and improved techniques.

Rural areas

Despite having the largest urban area in NSW and one of the fastest growing regions, Greater Sydney still retains important productive agricultural industries. Major agricultural activities in the region includes over 480 outdoor vegetable farms which accounts for 37% of all farms in the Greater Sydney region and 57% of all outdoor vegetable farms in NSW. Other industries include poultry production, grazing of sheep and cattle, cropping, dairy production, vineyards and thoroughbred horse racing industry are also present. Private landholders in these areas are relatively proactive in terms of pest control, either undertaking their own control or becoming involved in a broad-scale community control program.

Natural areas

Consisting of 80 National Parks and seven State forests, almost 70% of the region contains native vegetation. The western escarpment of the Blue Mountains is dominated by over one million hectares of World Heritage and Wilderness listed as National Parks. The sandstone plateaus to the north and south include large reserved areas such

as The Royal and Ku-ring-gai Chase National Parks. In contrast, the woodland communities of the Cumberland Plain have been heavily cleared for urban development and agriculture and very little of the remaining native vegetation is protected.

Furthermore, Greater Sydney is rich in Aboriginal culture and history, with the whole of the region being viewed as an Aboriginal site. The Office of Environment and Heritage (OEH) maintains the Aboriginal Heritage Information Management System (AHIMS) which list thousands of Aboriginal Places which have been declared across the region, many of which are threatened by pest species, such as goats and feral pigs.

Greater Sydney has the largest number of community volunteer groups of any region in Australia, consisting of around 1000 Landcare, Bushcare, Aboriginal and specific function groups actively involved in natural resource management. These groups are highly important, not just for on-ground activities that improve natural environments and deliver sustainable agricultural outcomes, but for early reporting of new incursions and ongoing pest surveillance.

Gateway

The region is unique in the sense that it is the gateway into NSW through entry points such as Port Botany, Sydney Airport (and soon to be Badger's Creek Airport) and Cruise Ship Terminals. Data shows that more than 100,000 containers arrive each month through Sydney ports, 41.9 million passenger arrivals and 500,000 tonnes of air freight arriving each year into Sydney Airport, which presents a major challenge to our region in regard to new incursions of pest species and diseases.

Our region also has a large number of Aquariums, Pet Shops and landowners who keep native and exotic pets in their backyard or home. These pose a threat to biosecurity because many of these species, if accidentally or deliberately released, have the potential to establish self-sustaining populations in the wild.

Land use in Greater Sydney Region

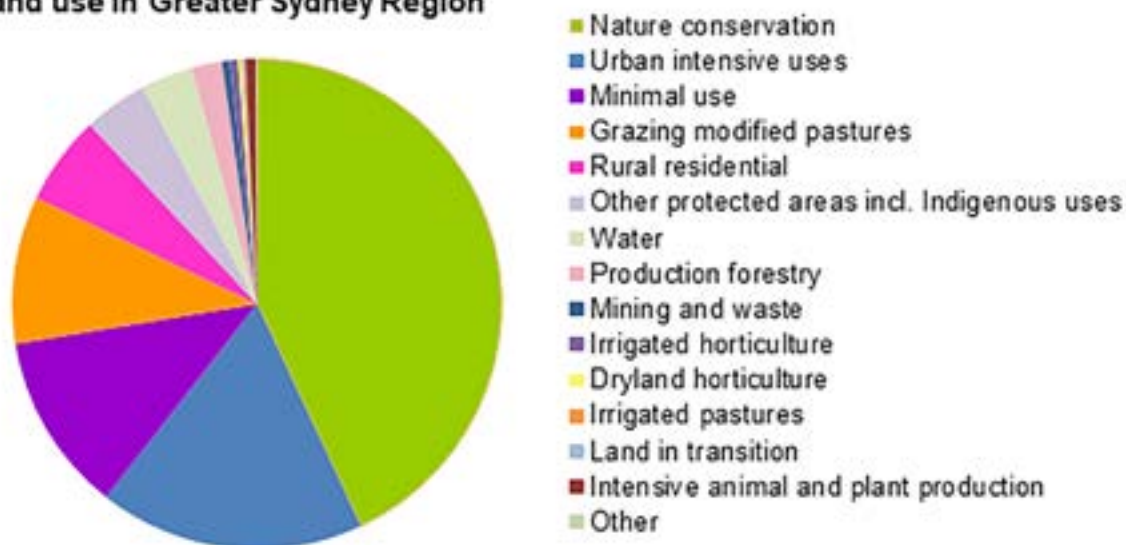


Figure 3.1: Overview of major land uses in the Greater Sydney Local Land Services region

Source: 2001/02 Land use of Australia, Version 3, Bureau of Rural Science

Greater Sydney Local Land Services Region

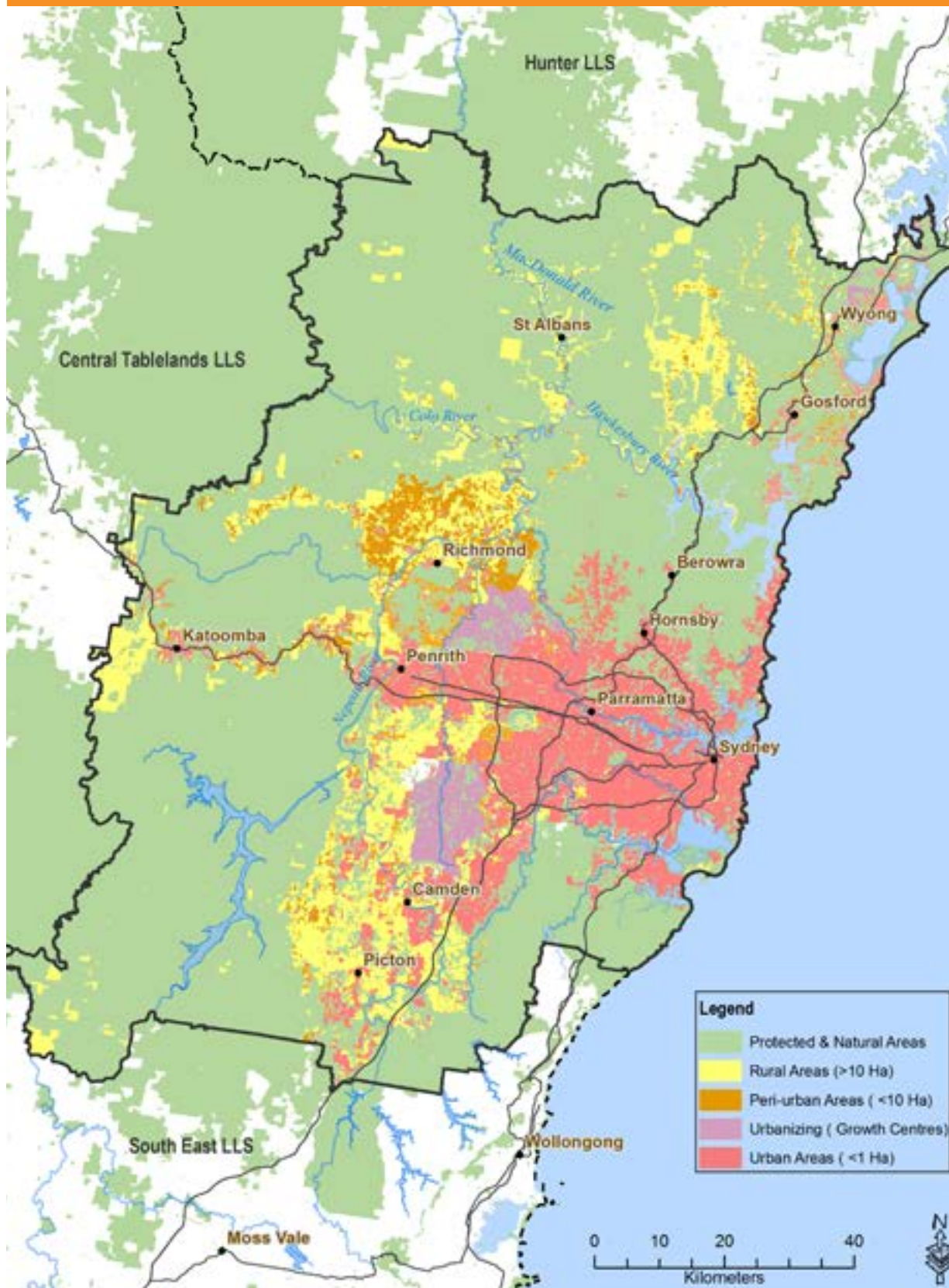


Figure 3.2: Greater Sydney Local Land Services region.

4. Managing our pest animals

The following section details the management categories that should be used to minimise and mitigate the impact pest animals have on the community, environment and primary industries.

Pest animals in Greater Sydney region have been prioritised based on this framework. For Further explanation of management categories listed above, please refer to the generalised invasion curve (Appendix 1).

Table 4.1: Regional pest animal management categories

Management Category	Definition
Prevention	GOAL: To prevent the pest animal species arriving and establishing RESPONSIBILITY: To recognise and report any sightings of alert or other exotic species.
Eradication	GOAL: To permanently remove the species from the Region and prevent its re-establishment. RESPONSIBILITY: To participate in coordinated eradication /monitoring programs
Containment	GOAL: To prevent the spread of the pest animal species onto other parts of the State or Region. RESPONSIBILITY: To participate in coordinated programs, and apply best practice pest animal management practices
Asset Based Protection	GOAL: To reduce the impact of widespread pest animals on key assets with high economic, environmental and social value. RESPONSIBILITY: To participate in coordinated programs, and apply best practice pest animal management practices. Ensure practices are coordinated with the wider community
Limited Action	GOAL: Applies only to species that have a low to negligible risk in the region or for which further investigation is required on effective control techniques and strategies for management. RESPONSIBILITY: Stay up-to-date with current information



5. Our priority pest species

Priority pests within the region were selected on their level of risk and feasibility of control. Their required management is summarised in Table 5.1. Control programs listed are based on measurable threats to the economy, environment and community. Other Government agencies such as NPWS and OEH and Local Councils within the region have extensive pest animal programs which occur throughout the region. These programs involve a range of stakeholders and play an important role in pest animal management across the region. Additionally, the use of volunteers and capacity building within the community is essential in the implementation phase of this Plan, promoting a 'shared responsibility' e.g. Cane Toads surveillance surveys or landowners using Indian Myna traps in their backyard.

Under the *NSW Biosecurity Act 2015*, it is not permitted to keep or release pest animals, with large penalties applying to those who do so.

Under the *Pesticides Act 1999* and the current Pesticide Control Order (PCO), all land managers must ensure that they have a current chemical accreditation to obtain and use 1080 e.g. AQF3 or AQF4 or a Local Land Services issued Vertebrate Pest Induction training card. The end user must supply evidence of this qualification to the Authorised Officer from Local Land Services prior to the issue of baits. As part of this plan, there will be an action by the Greater Sydney RPAC and Greater Sydney Local Land Services to seek an amendment the 1080 PCO for more appropriate use in peri-urban and urban environments.

Human safety is paramount when using pesticides for pest control. Amounts of 1080 used in baits does not pose a significant threat to humans as the pesticide is species specific and tight regulations and additional control measures such as risk assessments and distance restrictions must be adhered to. Furthermore, best practice techniques, Model Codes of Practice (COPs) and Standard Operating procedures (SOPs) for the humane control of key pest animal species are followed and can be accessed through the following link - <https://www.pestsmart.org.au/animal-welfare/humane-codes/>

Table 5.1: Species listed in this plan

Pest Animal	Management Category	Listed in Plan	Objective (area of focus)
Wild dog	Asset based protection	5.1	Reduce impacts on agricultural production, domestic pets, public safety and biodiversity
Feral pig	Eradicate/Contain/Asset based protection	5.2	Reduce impacts on agricultural production and biodiversity. Eradicate/contain new or localised populations. Maintain absence in pig free areas.
Red fox	Asset based protection	5.3	Reduce negative impacts on agricultural production, domestic pets and poultry and conserve biodiversity including threatened species
Wild rabbit	Asset based protection	5.4	Reduce negative impacts on grazing land, public amenity and environmental assets
Wild deer (all species)	Asset based protection/ Eradicate/Contain	5.5	Reduce negative impacts on agriculture production, public safety and high priority environmental assets including threatened species. Contain/eradicate in areas where deer are absent or populations are small and isolated
Cats	Asset based protection	5.6	Reduce the impacts to threatened species in urban/peri urban communities and sites of importance ecological value
Feral goats	Asset based protection/ Eradicate	5.7	Reduce the impacts on agricultural production and the environment and cultural heritage sites. Contain or eradicate localise populations.
Indian myna	Limited Action	5.8	Support coordinated control and development of new control techniques (where needed)
Common carp	Limited Action	5.9	Support coordinated biological control programs

Pest Animal	Management Category	Listed in Plan	Objective (area of focus)
Non-Indigenous animal	Surveillance as requested by NSW DPI, contain and eradicate where feasible	5.10	Environmental and economic values
Alert Species	Prevent	1.7	Protect environmental, economic and social values

The pest animal distribution maps in this plan are based on statewide data compiled in 2016 from reports submitted and gathered. The maps are at a coarse scale and provide general guidance only about pest animal distribution. A key priority for future implementation of this plan will be to improve reporting of pest animals to refine regional information collected on pest animal distribution and relative abundance. Improved information on distribution and abundance will better guide management and investment and assess effectiveness. .

5.1 Wild Dogs

Distribution and abundance

Wild dogs include feral dogs and Dingoes, which interbreed. Wild dog distribution and abundance generally overlays those areas deemed as wilderness areas or land used for agricultural production and are present along the southern, western and northern areas of the region (Figure 5.1).

Impacts

Wild dog impacts are largely related to impacts on the economy and community. Environmental impacts caused by wild dogs are considered minor, largely unknown and controversial. Wild dogs have significant impacts on agricultural enterprises through livestock predation and are to be primarily managed by section 15 of the *NSW Biosecurity Act 2015* under a General Biosecurity Duty.

The balance between wild dog management and dingo conservation is an important consideration in the region. The *NSW Wild Dog Management Strategy 2017-2021* (NSW Dept of Industry 2017) promotes a balance between managing wild dogs in areas where they have negative impacts and preserving the ecological role of dingoes. The conservation of dingoes is listed under the Goals of the strategy and is to be achieved by having Regional Strategic Pest Animal Management Plans and Wild Dog Management plans focus control on areas where the risk of negative impacts are greatest and monitoring impacts in other parts of the landscape with a low risk of negative impacts from wild dogs, to allow dingoes/wild dogs to fulfil their natural ecological role.

Attacks on livestock within rural, peri-urban and urban areas are a common occurrence and of growing concern to the community. Wild dog attacks are regularly reported by landholders in the region, particularly in the upper Hawkesbury and The Oaks/Oakdale areas. Domestic dogs and other pets are attacked and killed by wild dogs and there are cases of wild dogs harassing landholders who were trying to protect their livestock. With many absentee landholders in the Greater Sydney region, coordinating effective wild dog control programs is challenging.

Reports of stock losses are often blamed on wild dogs in semi-rural areas of the region; however attacks are often due to domestic dogs. Therefore investigating the origin of these dogs is required before use of control measures. Reports of feral or roaming dogs in rural or peri-urban areas may be dealt with by Local Government. However, if domestic dogs attack or harass livestock, they will be controlled under this Plan, using best practice methods, where the owner cannot be identified or, if the owner is known, but has not made reasonable attempts to control or restrain problem dogs. Other management of domestic dogs is the responsibility of local government under the *Companion Animals Act 1998*.

Control

The aim of wild dog control programs is to minimise livestock loss at the margins of natural areas where breeding populations occur and where wild dogs are known to attack livestock regularly. Strategic baiting programs are coordinated by Authorised Control Officers (ACO's) from Local Land Services. They issue both 1080 manufactured and meat wild dog baits to accredited landholders who comply with the 1080 Pesticide Control Order (PCO). Baiting programs occur in autumn and spring on an annual basis around the periphery of these areas for asset protection.

Wild dog control does not occur in non-impact areas or where wild dogs are exhibiting their normal ecological role as an apex predator.

Reactive baiting occurs throughout the year when reports of livestock loss are reported by landholders or land managers. Options for control and techniques are well established, but are limited in semi-rural and peri-urban environments due to public safety and legislative requirements. The risk to non-target species such as domestic dogs in many of these areas may also be high; requiring use of other control methods such as shooting or trapping to occur where feasible. A priority under this plan is to develop control options better aligned to peri-urban areas.

Land manager expectations/activities

All land managers can reduce risks from wild dog populations on land under their care and control by undertaking activities that:

- reduce the risk of wild dogs breeding on or being introduced to their land
- reduce the risk of wild dogs being released into the environment
- reduce the risk of wild dogs accessing easy food sources on their land
- reduce the negative impacts of wild dogs on priority assets on their land and neighbouring lands

Examples of activities/expectations a landholder should undertake to achieve these outcomes are:

- adhering to best practice control techniques
- participate in coordinated pest animal control programs
- undertaking management activities that incorporate both primary and supplementary pest animal control
- reporting any wild dog activity to neighbours and their local Biosecurity Officer from Local Land Services (and/or WildDog Scan)
- ensuring potential food sources such as carcasses, offal and food scraps are disposed of properly

Wild dog management plans

- NSW Wild Dog Management Strategy
- Central Coast Wild Dog Management Plan
- Oberon Vertebrate Pest Plan (Greater Sydney and Central Tablelands Local Land Services)
- Southern Highlands Wild Dog Management Plan (Greater Sydney and South East Local Land Services)

Other control programs

NPWS are represented on the Wild Dog working groups for the respective plans and implement a number wild dog programs across the region. Strategic control programs using multiple techniques are implemented in the Brisbane Water, Watagans, Dharug, Popran National Park (NP), Jiliby State Conservation Areas (SCA), Nattai National Park in the Burratorang SCA and Thirlmere Lakes NP to assist in asset protection of stock loss on neighbouring properties.

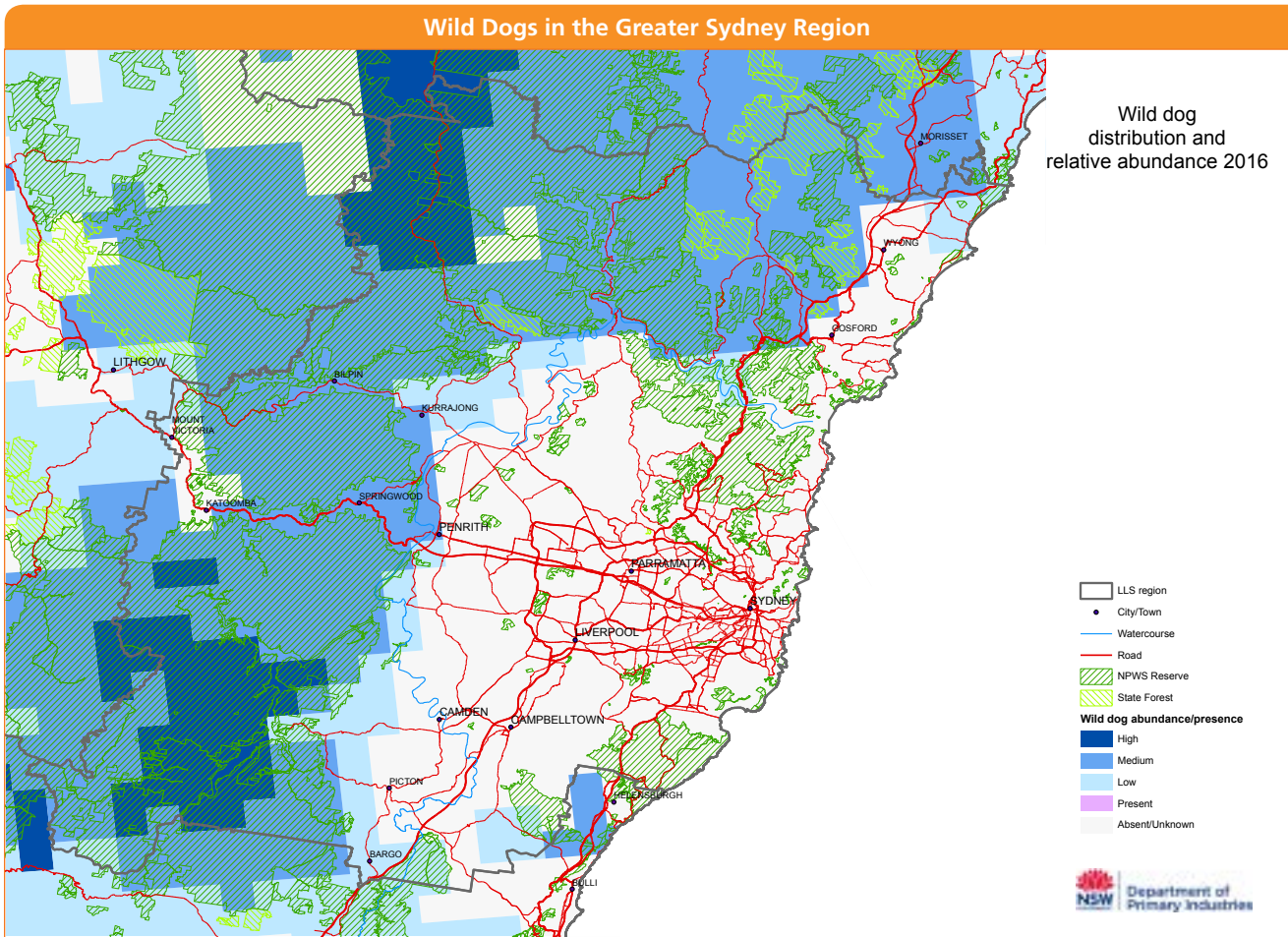


Figure 5.1: Wild dog distribution and relative abundance 2016 in the Greater Sydney region

Pest animal data has been sourced from NSW Government agencies and collated by the NSW DPI 2016





Table 5.2: Wild Dog sub-regional management programs

Program/ Name Area	Assets	Activities /Timeframe	Main Participants
Management Category/Objective: Asset Based Protection			
South West <ul style="list-style-type: none"> Barralier Macarthur North West <ul style="list-style-type: none"> Blue Mountains Upper Hawkesbury Central Coast Whole region <ul style="list-style-type: none"> Metro Peri-urban Urban Rural (reactive) 	Agricultural: Predation on livestock, damage to fencing due to chasing of stock, loss of reproduction rates Environmental: Predation on native fauna including threatened species and endangered populations, possible apex predator influences, hybridization with dingoes. Economic: Cost livestock loss and reduced reproduction rates, potential loss of producer certification due to disease spread, damaged infrastructure (fences) and cost of control efforts. Social: Human mental health impacts due to stock loss, attacks and stalking, disease spread and domestic pet attacks.	<ul style="list-style-type: none"> Facilitate Local Wild Dog Management Planning in priority areas Coordinate current and new strategic cross tenure ground baiting programs using multiple best practice methods (CPE's, leg hold trapping, guardian animals) Promote and facilitate funding and research programs to improve effectiveness of management options Monitor effectiveness of management programs on Wild Dog populations Timeframe: Ongoing	Greater Sydney LLS Central Tablelands LLS South East LLS Water NSW NPWS Local Government OEH Landholders Pest contractors Private contractors State Forests
Management Category/Objective: Investigate/Asset Based Protection			
Whole Region Domestic dog attacks (reactive)	Agricultural: Predation on livestock, damage to fencing due to chasing of stock, loss of reproduction rates Social: Human mental health impacts due to stock loss, attacks and stalking and domestic pet attacks.	<ul style="list-style-type: none"> Investigate the origin of dogs (remote cameras, door knocking) and loan out dog cage traps Engage with key Councils to discuss enforcement provisions and MOU's 	<ul style="list-style-type: none"> Greater Sydney LLS Local Government Landholders



Table 5.3: Wild dog community engagement activities

Outcome	Activity	Participants	Timeframe
1. Asset Based Protection 2. Investigation	<ul style="list-style-type: none"> • Establish Wild Dog management groups (where needed) • Develop control options better aligned to peri-urban areas • Improve community participation and education in key areas • Increase/improve reporting of stock losses, damage and sightings (FeralScan) • Capacity building - newspaper articles, newsletters, social media, field days and Vertebrate Pesticide Training Course • Wild Dog management workshops and education and awareness programs to: <ol style="list-style-type: none"> a. engage the large land managers, local government, smaller holdings, and peri-urban communities b. training in safe control methods c. promote best practice control d. communicate land manager obligation changes from Pest Control Order to Biosecurity legislation and GBD 	<ul style="list-style-type: none"> • Greater Sydney LLS • Central Tablelands LLS • South East LLS • Water NSW • NPWS • Local government • Landholders • State Forests 	Ongoing

5.2 Feral Pigs

Distribution and abundance

Feral pigs are absent from most of the region (Figure 5.2), but are established in the south western of the region as part of larger western population (Megalong Valley area). Two isolated populations exist in the Sydney basin, east of the divide near Penrith and Camden. These populations are likely to have been established from illegal translocations (releases) of feral pigs. There are no known, established populations of feral pigs on the Central Coast. There is an ongoing problem of the capture and illegal release of feral pigs within this region, sourced from other parts of the state.

Impacts

Feral pigs impact upon threatened species and threatened ecological communities 'due to rooting and wallowing behaviors' are well documented and present a significant threat to Australian native fauna and flora through habitat degradation, weed dispersal and opportunistic feeding behaviour. Feral pigs are well known to have a significant impact on water quality, which is of particular concern around Water NSW special areas in Greater Sydney. Feral pigs are to be primarily managed by section 15 of the *NSW Biosecurity Act 2015* under a general biosecurity duty.

Feral pigs pose a major biosecurity risk. Feral pigs are a reservoir host for a range of serious livestock and zoonotic diseases. Feral pigs eradicated locally have been found to carry, *Brucella suis*, *Leptospira* and Q-fever (*Coxiella burnetii*). These diseases pose a major health hazard to domestic animals and humans (NSW DPI, 2017).

In addition, pigs have the potential to transmit many extremely serious exotic animal diseases which would devastate our agriculture sector, including Foot and Mouth Disease and African Swine Fever. Greater Sydney is the gateway into NSW through Port Botany, Sydney Airport (and soon to be Badgery's Creek airport) and cruise ship terminals. As such it is essential that the ability of feral pigs to have contact with potentially infected food products brought in from other countries is kept to a very low level, through maintaining the Sydney basin with no ongoing feral pig populations.

Control

Feral pig control in the region aims to prevent new incursions and contain known isolated populations. New incursions or individual pig sightings are regularly reported throughout the region as a result of translocations or from illegally kept captive feral pigs and are dealt with as a priority. Where established feral pig populations occur, strategic and coordinated control programs are implemented to control distribution and abundance and seek long term eradication

where feasible. Compliance activities are undertaken for swill feeding of domestic pigs on a random/regular basis and all reports of feral pigs being kept in captivity or being released are investigated promptly under the *NSW Biosecurity Act 2015*, with large penalties issued for breaches.

Other control programs

In the Southern Blue Mountains area, NPWS undertake a feral pig control program. NPWS use a variety of techniques (baiting, trapping, aerial shooting) to control feral pigs for biodiversity and water quality outcomes.

Land manager expectations/activities

All land managers can reduce risks from feral pig populations on land under their care and control by undertaking activities that:

- reduce the risk of feral pigs breeding on or being introduced to their land
- reduce the risk of feral pigs being released into the environment
- reduce the risk of feral pigs accessing easy food sources on their land
- reduce the negative impacts of feral pigs on priority assets on their land and neighbouring lands

Examples of activities/expectations a landholder should undertake to achieve these outcomes are:

- adhering to best practice control techniques
- participate in coordinated pest animal control programs
- undertaking management activities that incorporate both primary and supplementary pest animal control
- reporting any feral pig activity to neighbours and their local Biosecurity Officer from Local Land Services (and FeralPig Scan)
- ensuring potential food sources such as carcasses, offal and food scraps are disposed of properly
- report any deliberate release of feral pigs (or other suspicious activity) to the NSW DPI Invasive Plants and Animals Inquiry Line: 1800 680 244



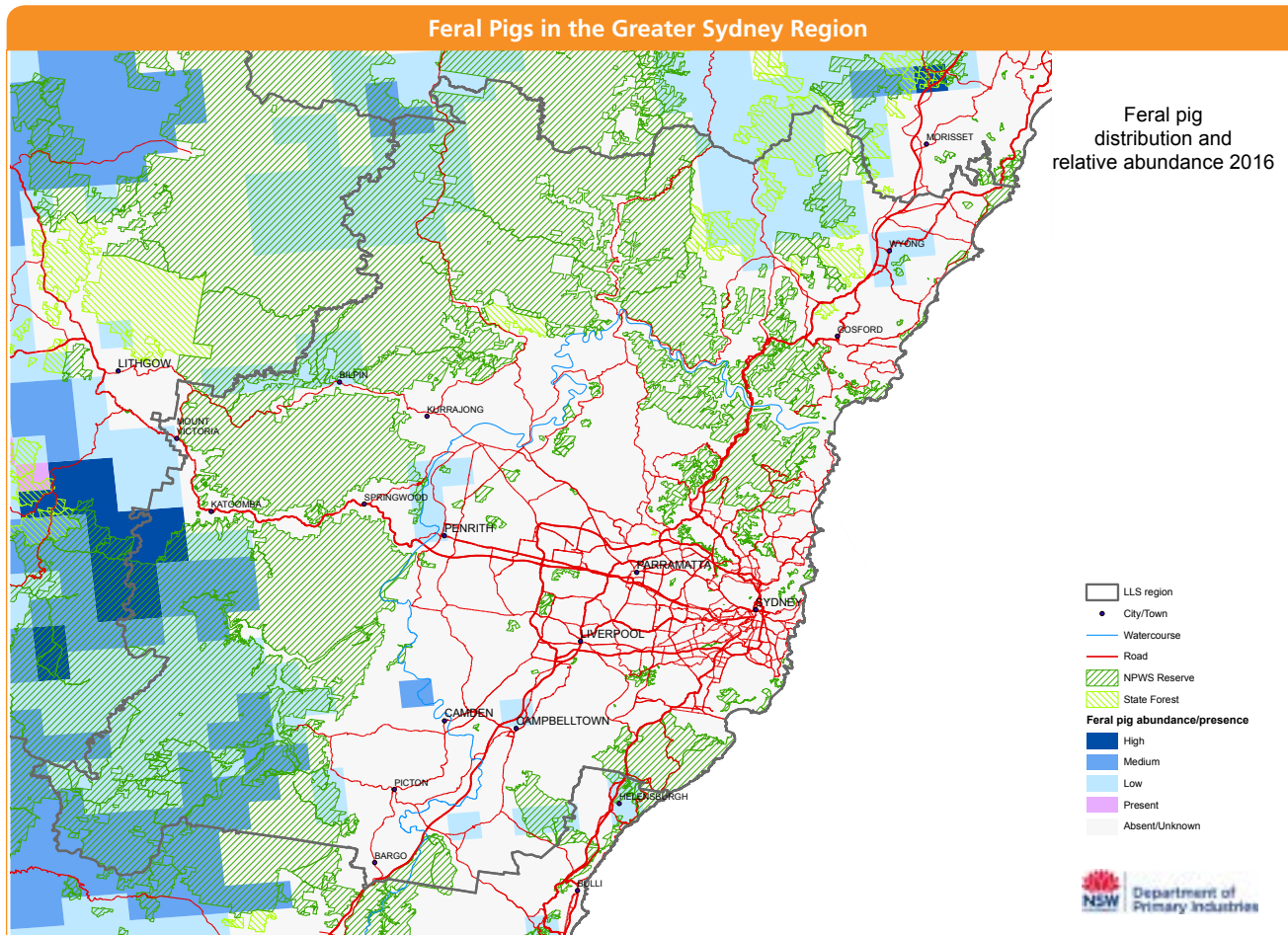


Figure 5.2: Feral pig distribution and relative abundance 2016 in the Greater Sydney region

Pest animal data has been sourced from NSW Government agencies and collated by the NSW DPI 2016



Table 5.4: Feral Pig sub-regional management programs

Program/ Name Area	Assets	Activities/Timeframe	Main Participants
Management Category/Objective: Asset Based Protection			
South West <ul style="list-style-type: none"> Camden Barrallier North West <ul style="list-style-type: none"> Blue Mountains Penrith 	<p>Agricultural:</p> <p>Impacts on agricultural production (vineyards), predation on livestock (lambs), damage to pastures, crops and fences</p> <p>Environmental:</p> <p>Damage to wetlands, impacts to water quality, predation on native species and degradation on threatened ecological ecosystems</p> <p>Cultural:</p> <p>Impacting on Aboriginal sites by polluting important cultural areas containing fresh water</p> <p>Economic:</p> <p>Cost to producers regarding loss of crops, produce and control efforts</p> <p>Social:</p> <p>Public safety, disease spread to humans and animals</p>	<ul style="list-style-type: none"> Coordinate current and new strategic cross tenure control programs using best practice methods (ground shooting, cage trapping, strategic baiting where PCO permits) Monitor effectiveness of management programs on feral pig populations <p>Timeframe: Ongoing</p>	<p>Greater Sydney LLS</p> <p>Central Tablelands LLS</p> <p>South East LLS</p> <p>Local Government</p> <p>Water NSW</p> <p>andholders</p>
Management Category/Objective: Eradication/Contain			
Whole Region <p>Metro</p> <p>Peri-urban</p> <p>Urban</p> <p>Rural</p> <p>Water NSW land</p> <p>Remaining areas where feral pigs are absent or populations are small and isolated</p>	<p>Agricultural:</p> <p>Impacts on agricultural production (vineyards), predation on livestock (lambs), damage to pastures, crops and fences</p> <p>Environmental:</p> <p>Damage to wetlands, impacts to water quality, predation on native species and degradation of threatened species and ecological communities</p> <p>Cultural:</p> <p>Impacting on Aboriginal cultural heritage sites by polluting important cultural areas containing fresh water</p> <p>Economic:</p> <p>Cost to producers regarding loss of crops, produce and control efforts</p> <p>Social:</p> <p>Public safety, disease spread to humans and animals</p>	<ul style="list-style-type: none"> Monitor pathways of potential introduction and develop preventative options (where possible). Support programs to monitor and remove pigs from priority areas. Develop management plans and implement control programs for new feral pig populations and in priority areas. Manage new populations with aim of significant reduction and eradication (if possible) <p>Timeframe: Ongoing</p>	<ul style="list-style-type: none"> Greater Sydney LLS South East LLS Local Government Water NSW NPWS Water NSW Crown Lands, Hunting community Landholders,



Table 5.5: Feral Pig community engagement activities

Outcome	Activity	Participants	Timeframe
1. Asset Based Protection	Establish feral pig management groups	<ul style="list-style-type: none"> • Greater Sydney LLS, • South East LLS, • Water NSW • NPWS • NSW DPI • Local Government • Landholders • Hunting Community 	Ongoing
2. Eradicate	Improve community participation and education in key areas		
3. Contain	Increase/improve reporting of stock losses, damage and sightings (FeralScan)		
	Capacity building - newspaper articles, newsletters, social media, field days and Vertebrate Pesticide Training Course		
	Educate hunting community about disease risk, illegal activities and legislation requirements under <i>NSW Biosecurity Act 2015</i>		

5.3 Red Fox

Distribution and abundance

The Red Fox is widely distributed and well established throughout the entire region. Their population size density and distribution is largely dependent on disturbance of natural habitats, adequate shelter and food availability (NSW Scientific Committee 1998).

Foxes are highly opportunistic by nature and have adapted exceptionally well to living in urban and peri-urban areas. However, this presents a challenge for their management as options for controlling foxes are extremely limited in closely settled rural, peri-urban and urban areas due to limitations of control techniques including restrictions outlined in the 1080 PCO.

Impacts

Foxes are well known to have a significant impact on the environment and have been linked to regional declines and extinctions of native species with the region. In NSW, predation by foxes is listed as a key threatening process under the *NSW Biodiversity Conservation Act 2016*.

However, fox impacts to the community and economy in the Greater Sydney region are considered to be relatively minor and generally limited to small sheep production enterprises, predation on poultry and pet animals and spreading weeds. However, the number of threatened species listings where foxes are identified as a threat continue to increase (Australian Government 2013). Foxes are labeled as a public nuisance to the community, affecting landholders' ability to keep backyard poultry and often access people's backyards to take advantage of left over pet food, rubbish and scraps.

Control

Coordinated control programs occur in autumn and spring to coincide with breeding patterns and dispersal of juvenile foxes. Such control programs fall within the 'asset based protection' category to protect threatened/regionally significant biodiversity as well as agricultural production. ACO's from Local Land Services issue both manufactured and meat 1080 baits to authorised landholders. 1080 is a highly regulated pesticide which requires an accreditation to handle. Australian native animals typically have lower sensitivity to this toxin than canids (foxes and dogs), meaning the risk to native species is low. The risk to domestic dogs may be high where they can range freely however the Companion Animals Act requires people to confine their dogs and control them in public areas, greatly reducing risk of accidental baiting in urban areas. Where a substantial risk is present to domestic dogs other control methods such as fox cage traps are used. Options for control are limited in semi-rural and peri-urban environments due to restrictions in the 1080 PCO. Reactive baiting or other best practice control occurs throughout the year, particularly during spring months during lambing or when reports of poultry loss are reported.

Other control programs

NPWS implements fox control programs under the Saving Our Species (SOS) conservation program which incorporates priority species and sites from the NSW Fox Threat Abatement Plan. Priority fox control programs are implemented in the Watagans and Yengo (St Albans sector) National Parks to protect endangered brush-tailed rock wallabies; in Ku-ring-gai Chase and Garigal National Park for the conservation of the endangered southern brown bandicoot; in Wyrabalong National Park, Tuggerah Nature Reserve and Towra Point Nature Reserve to protect endangered shorebirds including Pied Oyster Catcher and Little Tern; and at North Head for the conservation of little penguin and long nose bandicoot endangered populations. NPWS works in collaboration with external stakeholders, local government and other land managers, and uses integrated techniques including 1080 and soft jaw trapping to control foxes. Fox control for biodiversity conservation is continuous and ongoing; 1080 is laid 6 weekly or timed when threatened species are most vulnerable such as when shorebirds are nesting. Fox activity and threatened species response to fox control is monitored by NPWS and OEH.

Land manager expectations/activities

All land managers can reduce risks from fox populations on land under their care and control by undertaking activities that:

- reduce the risk of foxes breeding on or being introduced to their land
- reduce the risk of foxes accessing easy food sources on their land
- reduce the negative impacts of foxes on priority assets on their land and neighbouring lands

Examples of activities/expectations a landholder should undertake to achieve these outcomes are:

- adhering to best practice control techniques
- participate in coordinated pest animal control programs
- undertaking management activities that incorporate both primary and supplementary pest animal control
- reporting any fox activity to neighbours and their local Biosecurity Officer from Local Land Services (and/or FoxScan)
- ensuring potential food sources such as carcasses, offal and food scraps are disposed of properly





Table 5.6: Red Fox sub-regional management programs

Program/ Name Area	Assets	Activities/Timeframe	Main Participants
Management Category/Objective: Asset Based Protection			
South West <ul style="list-style-type: none"> Menangle Macarthur Sutherland North West <ul style="list-style-type: none"> Mulgoa Bilpin Hawkesbury Central Coast Metro <ul style="list-style-type: none"> Sydney North VPAC Whole region <ul style="list-style-type: none"> Metro Peri-urban Urban Rural (reactive) 	Agricultural: Predation on livestock (lambs), backyard poultry and disease risk (e.g. <i>Neospora caninum</i>) Environmental: Declines in a wide range of 'critical weight range' ground-dwelling mammals up to 5.5kg and ground-nesting birds, predation of reptiles, amphibians, invertebrates and threatened species, failures of native fauna re-introduction programs and vectors of weed spread Economic: Cost to producers regarding dairy and beef cattle pregnancy termination, predation of calves, poultry, lambs, spread of hydatids (worms) to livestock and cost of control efforts Social: Public nuisance, human mental health impacts due to pet and livestock attacks	<ul style="list-style-type: none"> Coordinate current and new strategic cross tenure ground baiting programs using multiple best practice methods (CPE's, leg hold trapping and guardian animals) Support fox management consistent with the NSW Fox Threat Abatement Plan (TAP) and Saving Our Species (SOS) priority sites and actions Monitor effectiveness of management programs on fox populations Monitor threatened species response to fox control Timeframe: Ongoing	<ul style="list-style-type: none"> Greater Sydney LLS Local Government NSW DPI, Cumberland Land Conservancy NPWS Private Contractors Landholders Landcare

Table 5.7: Red Fox community engagement activities

Outcome	Activity	Participants	Timeframe
1. Asset Based Protection	Establish Red Fox management groups Improve community participation and education in key areas Increase/improve reporting of stock losses, damage and sightings (FeralScan) Capacity building - newspaper articles, newsletters, social media, field days and Vertebrate Pesticide Training Course	<ul style="list-style-type: none"> Greater Sydney LLS South East LLS Water NSW NPWS NSW DPI Local Government Landholders 	Ongoing

5.4 Wild Rabbit

Distribution and abundance

Wild Rabbits are widely distributed and well established throughout the region, including highly urban environments such as caravan parks, retirement villages and urban areas (Figure 5.3) and exhibit low or no dependence on humans to meet their ecological requirements (NSW Scientific Committee 2002). Rabbit abundance and density varies significantly across the region, ranging from low to moderate. These populations' patterns are affected by seasonal conditions across the landscape, which in turn influence food availability, breeding and juvenile survival rates. Prevailing weather patterns can have a significant impact on populations due to the relationship with bio-control vectors that aid in the spread of viruses such as Myxomatosis and Rabbit Haemorrhagic Disease Virus (RHDV - Calicivirus) strains.

Impacts

Rabbits have a minor to moderate impact on the broader community and economy damaging infrastructure, areas of public amenity and residential property. There are many examples throughout the region of rabbits causing damage to the environment, grazing on native species, altering composition and structure of indigenous vegetation communities including threatened ecological communities, browsing on crops and introduced pastures causing loss of productivity on grazing lands, dietary competition with native species, land degradation through soil disturbance, loss of topsoil by wind/rain, slope instability through browsing, digging, creation of warrens and trip hazards causing injury to both livestock and humans. In NSW, competition and herbivory by the European rabbit is listed as a key threatening process under the *NSW Biodiversity Conservation Act 2016*.

Control

Coordinated and strategic rabbit control programs occur throughout the region through the use of the registered pesticide Pindone, which is mixed with either carrots or oats and applied during autumn and spring months. Local Land Services also facilitates an annual regional release of the RHDV-K5 with land managers, Local Government, NPWS and private contractors. Furthermore, shooting, trapping and fumigation of warrens are techniques also utilised in the region by Councils and land managers.

Domestic pet rabbits

Vaccinations for pet domestic rabbits have been available in Australia since 1996 for the prevention of RHDV1. A NSW DPI study demonstrated the effectiveness of this vaccination approach. Therefore, it is highly recommended to vaccinate pet domestic rabbits to ensure immunity to the virus, which is mainly spread by contact between other rabbits and host-sharing insects/parasites. Vaccination is required a minimum of 2 weeks before exposure to the RHDV to allow a rabbit to develop a protective immunity. Furthermore, rabbit hutches should be mosquito-proof and away from interactions with wild rabbits which can spread diseases to domestic pets. Domestic rabbits should not be free roaming and should be contained in a secure enclosure.

Land manager expectations/activities

All land managers can reduce risks from rabbit populations on land under their care and control by undertaking activities that:

- reduce the risk of rabbits breeding on or being introduced to their land
- reduce the risk of rabbits accessing easy food sources on their land
- reduce the negative impacts of rabbits on priority assets on their land and neighbouring lands

Examples of activities/expectations a landholder should undertake to achieve these outcomes are:

- adhering to best practice control techniques
- participate in coordinated pest animal control programs (e.g. baiting and virus release)
- undertaking management activities that incorporate both primary and supplementary pest animal control
- reporting warrens and known harbour to their local Biosecurity Officer from Local Land Services (and RabbitScan)

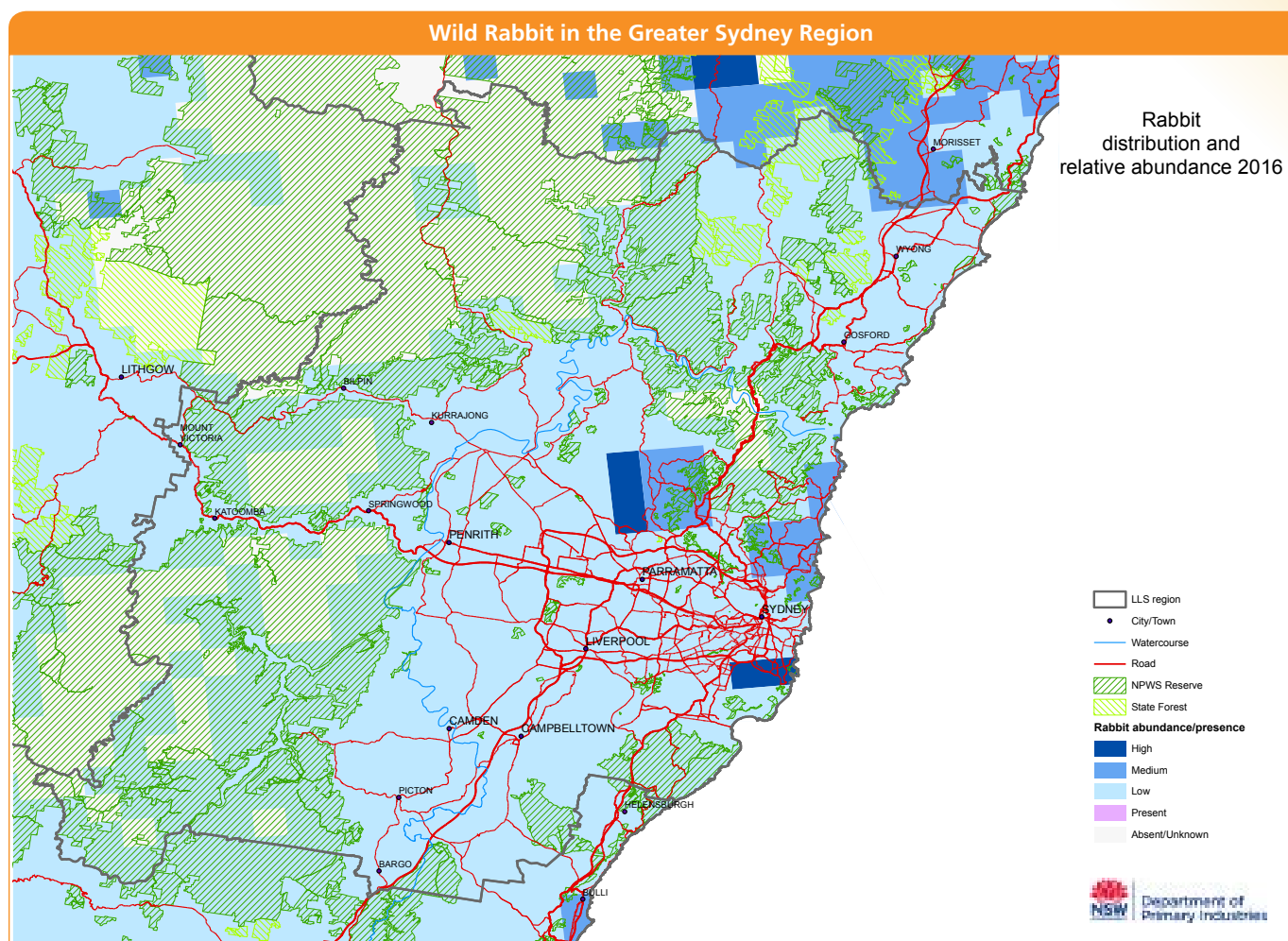


Figure 5.3: Wild Rabbit distribution and relative abundance 2016 in the Greater Sydney region

Pest animal data has been sourced from NSW Government agencies and collated by the NSW DPI 2016





Table 5.8: Wild Rabbit sub-regional management programs

Program/ Name Area	Assets	Activities	Main Participants
South West • Sutherland North West • Hills Shire Metro • Sydney North VPAC Whole region • Metro • Peri-urban • Urban • Rural (reactive) • Regional RHDV release	Management Category/Objective: Asset Based Protection		
	Agricultural: Damage to pasture, crops and fences	<ul style="list-style-type: none"> • Coordinate current and new strategic cross tenure trail/station programs and other approved techniques 	<ul style="list-style-type: none"> • Greater Sydney LLS • NSW DPI • NPWS • Local Government • Landholders, • Landcare • Private contractors
	Environmental: Impact on indigenous and threatened fauna species that prefer green grass and herbage; reduces survival and recruitment of several threatened plant species and may affect the structure and composition of vegetation communities, including threatened ecological communities	<ul style="list-style-type: none"> • Increase effective rabbit management options available by supporting Research and Development • Support bio-control and virus release control programs • Monitor effectiveness of management programs on rabbit populations • Monitor vegetation response (threatened species or ecological communities) to rabbit control 	
	Economic: Cost to producers and landowners regarding erosion and topsoil loss due to removal of vegetation, damage and feeding on horticulture, nursery plants, crops and cost of control efforts	Timeframe: Ongoing	
	Social: Safety issue regarding rabbit warrens and diggings		

Table 5.9: Wild Rabbit community engagement activities

Outcome	Activity	Participants	Timeframe
1. Asset Based Protection	<ul style="list-style-type: none"> • Establish Wild rabbit management groups • Improve community participation and education in key areas • Increase/improve reporting of damage and sightings (FeralScan) • Capacity building - newspaper articles, newsletters, social media, field days and Vertebrate Pesticide Training Course 	<ul style="list-style-type: none"> • Greater Sydney LLS • South East LLS • Water NSW • NPWS • NSW DPI • Local Government • Landholders 	Ongoing

5.5 Wild Deer (Chital, Fallow, Red, Rusa and Sambar species)

Distribution and abundance

Wild Deer are an expanding group of pest species and are moderately distributed through the region (Figures 5.4-5.5). A number of species exist including; Fallow, Rusa, Red, Sambar and Chital Deer. Locations where Deer have become well established include the Illawarra region, Royal National Park south of Sydney and Hawkesbury areas such as Kurrajong. Deer are in low to moderate numbers throughout the Wollondilly region, Central Coast and upper reaches of the Hawkesbury towards Mount Irvine. Other populations exist in the region with varying distributions and population density.

Impacts

Deer have a significant impact on the environment and in NSW, herbivory and environmental degradation caused by deer is listed as a key threatening process under the *NSW Biodiversity Conservation Act 2016*. The key threatening process listing was attributed from research conducted locally in the Royal National Park where Rusa Deer were found to have a range of environmental impacts including; damage to native vegetation and threatened ecological communities such as Littoral rainforest through trampling and antler rubbing, weed dispersal and impacts to seeding recruitment and growth (NSW Scientific Committee 2005).

Deer impact the community by being a public nuisance, browsing on garden plants and have been the cause of motor vehicle and railway accidents. These community based impacts are becoming an increasing problem along the east coast of NSW. Other impacts, largely related to agriculture include competition with livestock, crop damage, damage to fencing, injury to livestock such as horses and are known to carry some diseases that affect livestock. Although not qualified scientifically, many agriculturalists report these impacts are significant to their properties and enterprises.

Control

Deer control across the region is complex due to some populations being managed as 'pests' and others

as 'game' animals. The Game Licensing Unit (GLU) is a dedicated unit under the Fisheries Branch of the NSW DPI and is responsible for the delivery of functions of the *Game and Feral Animal Control Act 2002* and associated regulations, with the GLU placing restrictions on deer control. Further information can be found on the following website:

<https://www.dpi.nsw.gov.au/hunting>.

In specific instances, Greater Sydney Local Land Services will seek to have such regulations removed on a Local Government and 'case by case' basis where there is a demonstrated need to do so. Following the outcomes of the Supplementary Pest Control (SPC) program where Sporting Shooters Associated of Australia (SSAA) NSW partnered with NPWS to provide accredited volunteer hunters to participate in an initial three-year trial of pest control on National Park estate, Greater Sydney Local Land Services will review the outcomes of the program and consideration will be given to hunting on other land in the region, depending on public safety and effectiveness.

Review of these regulations will be considered on a locality basis with input from the hunting community, local landholders and the NSW DPI GLU. Where evidence indicates the need for changes this will occur during the implementation phase of the plan.

Greater Sydney Local Land Service aim to eradicate deer where they exist in isolated pockets in low numbers based on the eradication principal of the *Invasive Species Plan*. Established Deer populations across the region will be managed seeking to limit their abundance, contain their spread, protect assets which deer impact upon, and minimise threats to public safety (subject to available funds and feasibility). Effective control in the region is often difficult and limited, due to shooting being the only practical control method and the peri-urban context which can limit the safe use of firearms.

Wild deer management plans

- NSW Deer Management Strategy
- Macarthur Wild Deer Management Plan
- North Illawarra Wild Deer Management Plan

Other control programs

NPWS have been controlling Rusa deer in the Royal National Park since February 2002. Although the NPWS program is implemented only on National Park, it involves a number of stakeholders and there is collaboration with adjoining programs. NPWS also undertake deer control in Scheyville National Park, Sutherland Shire Council implements shooting (mobile and hide) and trapping operations at various suitable locations using best practice guidelines.

These control methods are effective, although in areas with high deer numbers, limited council owned/managed land, unsuitable or inaccessible sites and large sections of privately owned land, has made it difficult to conduct culling operations. For this reason, Sutherland Shire Council has decided to engage private land owners, in affected suburbs, to participate in a private property deer trapping program.

Willing residents had their property assessed for suitability and if suitable, enter into a private property agreement with council to install and maintain Clover Traps on their property. Landholders had their property assessed for suitability and if suitable, enter into a private property agreement with council to install and maintain Clover Traps on their property. This highly targeted approach significantly increases the chance of the program's success long term by allowing alternate control methods in areas otherwise inaccessible.

Engagement with contract/pest shooters and recreational hunters will be ongoing throughout the implementation and consultation phase of this plan.

Land manager expectations/activities

The need to control deer humanely and in a way which poses no risks to the safety of others are key expectations of the whole community where deer control is required. LLS has developed comprehensive systems to ensure all deer control done under this plan meets these expectations.

All land managers can reduce risks from deer populations on land under their care and control by undertaking activities that:

- reduce the risk of deer species breeding on or being introduced to their land
- reduce the risk of deer species being released into the environment
- reduce the negative impacts of deer species on priority assets on their land and neighbouring lands

Examples of activities/expectations a landholder should undertake to achieve these outcomes are:

- adhering to best practice control techniques
- participate in coordinated pest animal control programs
- undertaking management activities that incorporate both primary and supplementary pest animal control
- reporting any deer species sightings or activity out of the mapped distribution area to their local Biosecurity Officer from Local Land Services (and DeerScan), any deliberate release of deer species or other suspicious activity to the NSW DPI GLU and any road related incidents or near misses to local police

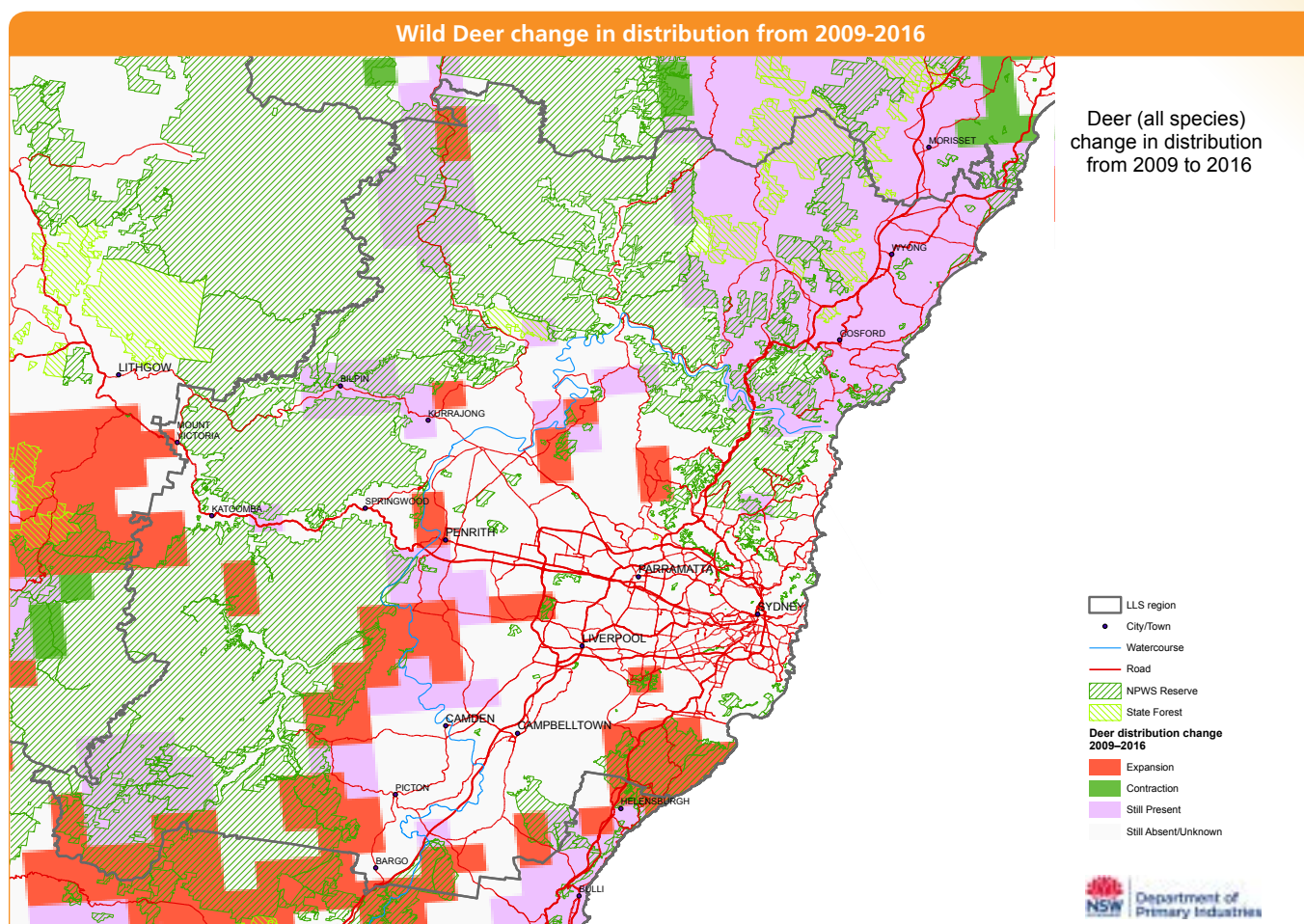


Figure 5.4: Wild Deer (all species) change in distribution from 2009 – 2016

Pest animal data has been sourced from NSW Government agencies and collated by the NSW DPI 2016



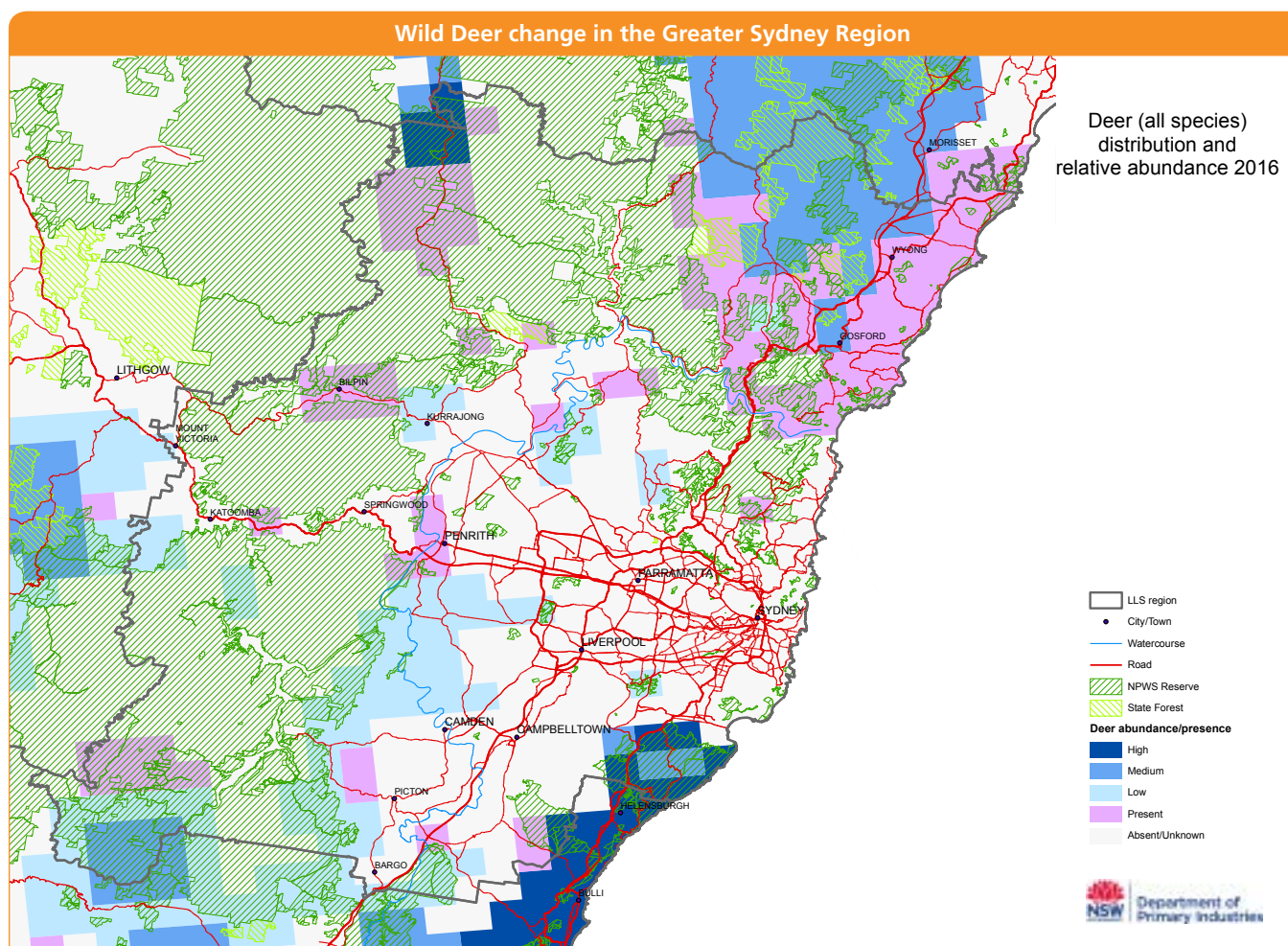


Figure 5.5: Wild Deer (all species) distribution and relative abundance 2016 in the Greater Sydney region

Pest animal data has been sourced from NSW Government agencies and collated by the NSW DPI 2016





Table 5.10: Wild Deer sub-regional management programs

Program/ Name Area	Assets	Activities	Main Participants
Management Category/Objective: Asset Based Protection			
South West Macarthur Sutherland	<p>Agricultural:</p> <p>Damage to pasture, crops and fences</p> <p>Environmental:</p> <p>Grazing and trampling impacts alter seedling recruitment and vegetation cover of threatened plant communities</p> <p>Economic:</p> <p>Damage to crops, gardens, fences, insurance claims and cost of control efforts</p> <p>Social:</p> <p>Safety issue regarding traffic hazards/accidents, trampling of gardens, damaging fences and aggressive behaviour to people and domestic pets.</p>	<ul style="list-style-type: none"> Coordinate current and new strategic cross tenure control programs using ground shooting other approved techniques (fencing, radio-collaring, trapping, habitat modification) Support research and trials to improve effectiveness of Wild Deer best management options Monitor effectiveness of management programs on Wild Deer populations Monitor vegetation response (threatened species or ecological communities) to deer control <p>Timeframe: Ongoing (note: some programs dependent on funding)</p>	<ul style="list-style-type: none"> Greater Sydney Local Land Services Local Government NPWS Landholders Private contractors Hunting community
Management Category/Objective: Containment/Eradication			
Whole Region - Metro - Peri-urban - Urban - Rural - Remaining areas where wild deer are absent or populations are small and isolated	<p>Agricultural:</p> <p>Damage to pasture, crops and fences</p> <p>Environmental:</p> <p>Grazing and trampling impacts alter seedling recruitment and vegetation cover of threatened plant communities</p> <p>Economic:</p> <p>Damage to crops, gardens, fences, insurance claims and cost of control efforts</p> <p>Social:</p> <p>Safety issue regarding traffic hazards/accidents, trampling of gardens, damaging fences and aggressive behaviour to people and domestic pets.</p>	<ul style="list-style-type: none"> Monitor pathways of potential introduction and develop preventative options (where possible) Support programs to monitor and remove wild deer from priority areas Develop management plans and implement control programs for new wild deer populations and in priority areas Manage new populations with aim of significant reduction 	<ul style="list-style-type: none"> Greater Sydney LLS Local Government NPWS Landholders Private contractors Hunting community

Table 5.11: Wild Deer community engagement activities

Outcome	Activity	Participants	Timeframe
1. Asset Based Protection	<ul style="list-style-type: none"> Establish Wild Deer management groups Improve community participation and education in key areas e.g. public safety 	<ul style="list-style-type: none"> Greater Sydney LLS NSW DPI NPWS 	Ongoing
2. Containment	<ul style="list-style-type: none"> Increase/improve reporting of damage and sightings (FeralScan) 	<ul style="list-style-type: none"> Local Government 	
3. Eradication	<ul style="list-style-type: none"> Capacity building - Newspaper articles, newsletters, social media, surveys and field days 	<ul style="list-style-type: none"> Landholders 	

5.6 Cats

Distribution and abundance

Cats are widely distributed throughout the region and have been recorded visually and through the use of remote cameras in a range of habitats and are known to occur in virtually all terrestrial habitats in Australia (NSW Scientific Committee 2000). Cats are adaptive and effective predators found mostly in low numbers, but are known to have a home range of up to several kilometres and can travel large distances depending on prey availability, habitat type and breeding season.

Cat populations are commonly divided into three classes:

- Feral – those cats completely independent of humans
- Stray – those cats relying to some extent on humans
- Domestic – those cats living with humans and having their needs intentionally met by humans

Impacts

Predation of native wildlife by Cats is listed in NSW as a key threatening process under the *NSW Biodiversity Conservation Act 2016*. Cats have a significant impact on the environment through predation of birds, reptiles, amphibians and small mammals. Predation by cats on native wildlife is considered to be a major contributor to the extinction of 22 Australian mammals. A further 142 threatened species are impacted as a result of feral cat predation in Australia (RSPCA 2017).

In the region cat impacts to the community and economy are considered to be minor, however cats can pose a significant health risk to livestock, native species and humans through the spread of diseases such as *toxoplasmosis* and *sarcosporidiosis*.

Control

The problem of free roaming cats is highly contentious with strong support from advocates for both control and protection. Control techniques available to manage feral cat populations are very limited. Challenges exist surrounding the management of domestic cats. Under the *Companion Animals Act 1998* it is the responsibility of Local Government to regulate domestic cats through registration and control measures to deal with nuisance cats. Current regulations require that all domestic cats must be identified. This may either be in the form of a microchip or some other means of identification such as a collar with the owner's name and address. The Act currently permits domestic cats to roam freely. This results in many cats injuring and killing native wildlife, even when fed daily. This means it is very difficult to manage cat predation effectively, particularly at night time when most roaming behaviour occurs.

Councils may designate Wildlife Protection Areas (WPAs) from which cats must be excluded and similarly NPWS requires cats to be kept out of national parks and reserves. However, these provisions are very difficult to enforce. Hence, serious impacts of domestic, stray and feral cats on native wildlife and particularly threatened species are ongoing issues for conservation in the urban and peri-urban areas covered by this plan. Further strategies to promote responsible pet ownership practices and gather support from the broader community on feral cat control are critical to the success of any control program aimed at reducing feral cat populations. Cat owners are encouraged to contain their cats at night time and particularly to prevent them straying into adjoining natural areas.

Greater Sydney Local Land Services will work with Local Government to determine the most effective long term feral cat control options and domestic cat management approaches locally. It will consider whether such control measures can be implemented throughout the region in areas where cats are impacting upon biodiversity, particularly in areas declared as National Parks or WPAs.



Table 5.12: Cat sub-regional management programs

Program/ Name Area	Assets	Activities	Main Participants
Whole Region - Metro - Peri-urban - Urban - Rural	Management Category/Objective: Asset Based Protection		
	Environmental: Reduce the negative impacts caused by predation on 'critical weight range native fauna (0.35 to 5.5kgs) and the impacts on threatened species and endangered populations in urban and peri-urban communities and sites of importance ecological value. Economic: Disease transmission and cost of control efforts Social: Human health impacts and domestic pet attacks	<ul style="list-style-type: none"> Identify key assets and locations in the region that are impacted by cats Monitor effectiveness of management programs on cat distribution and abundance Timeframe: Ongoing	<ul style="list-style-type: none"> Greater Sydney LLS Local Government NPWS Landholders

Table 5.13: Cat community engagement activities

Outcome	Activity	Participants	Timeframe
1. Asset Based Protection	<ul style="list-style-type: none"> Improve community participation and education in key areas e.g. responsible pet ownership and impacts to biodiversity Increase/improve reporting of damage and sightings (FeralScan) Capacity building - Newspaper articles, newsletters, social media, surveys and field days 	<ul style="list-style-type: none"> Greater Sydney LLS Local Government NSW DPI Landholders 	Ongoing



5.7 Feral Goats

Distribution and abundance

Feral goats can be found in small isolated populations in the Greater Sydney region and will be managed as asset based protection unless populations are small and isolated where eradication is feasible.

Impacts

Locally, their impact on the economy and community is insignificant; however they can compete with sheep and some native animals for pasture, contribute to land degradation through grazing and browsing and impact on biodiversity by damaging the vegetation and competing with native animals. Depending on the goat livestock market and trends, goats are often considered a source of income and can be mustered and sent to stock sales and abattoirs. There have been some situations locally of feral goats posing a safety risk to motorists on major roads.

Table 5.14: Feral Goat sub-regional management programs

Program/ Name Area	Assets	Activities	Main Participants
Management Category/Objective: Asset Based Protection			
Whole Region - Metro - Peri-urban - Urban - Rural	Agricultural: Compete with livestock for pasture, damage crops and fences Environmental: Compete with native species for food resources, browse on native flora in areas of high conservation priority Cultural: Impact on Aboriginal Cultural Heritage sites such as sandstone shelter, rock art and engravings etc. Economic: Damage to fencing and potential disease transmission to cattle Social: Public Safety – motor vehicle accidents	<ul style="list-style-type: none"> Identify key assets and locations in the region that are impacted by feral goats Monitor effectiveness of management programs on Feral Goat populations Timeframe: Ongoing	<ul style="list-style-type: none"> Greater Sydney LLS Local Government NPWS Landholders Private contractors





Program/ Name Area	Assets	Activities	Main Participants
Whole Region <ul style="list-style-type: none"> • Metro • Peri-urban • Urban • Rural 	Management Category/Objective: Eradication		
	<p>Agricultural:</p> <p>Compete with livestock for pasture, damage crops and fences</p> <p>Environmental:</p> <p>Compete with native species for food resources, browse on native flora in areas of high conservation priority</p> <p>Cultural:</p> <p>Impact on Aboriginal Cultural Heritage sites such as sandstone shelters, rock art and engravings etc.</p> <p>Economic:</p> <p>Damage to fencing and potential disease transmission to cattle</p> <p>Social:</p> <p>Public Safety – motor vehicle accidents</p>	<ul style="list-style-type: none"> • Monitor pathways of potential introduction and develop preventative options (where possible). • Support programs to monitor and remove wild goats from priority areas. • Develop management plans and implement control programs for new goat populations and in priority areas. • Manage new populations with aim of significant reduction. <p>Time frame: Ongoing</p>	<ul style="list-style-type: none"> • Greater Sydney LLS • Local Government • NPWS • Landholders • Private contractors

Table 5.15: Feral Goat community engagement activities

Outcome	Activity	Participants	Timeframe
1. Asset Based Protection 2. Eradication	<ul style="list-style-type: none"> • Surveillance and monitoring to locate any changes in distribution or new feral goat populations • Support programs to monitor and remove goats from priority areas e.g. NPWS programs • Improve community participation and education in key areas e.g. responsible pet ownership and impacts to biodiversity • Increase/improve reporting of damage and sightings (FeralScan) • Capacity building - Newspaper articles, newsletters, social media, surveys and field days 	<ul style="list-style-type: none"> • Greater Sydney LLS • Local Government • NPWS • Landholders • Private contractors 	Ongoing

5.8 Indian Myna

Distribution and abundance

Indian Myna's are mainly found in urban, peri-urban and adjoining open areas and are considered to widespread in those environments in the Greater Sydney region.

Impacts

Indian Myna's are considered a pest in urban, peri-urban and rural areas throughout the region. They cause damage to the environment through selective feeding and competition for resources (such as hollows and food), occupy buildings, damage infrastructure (through nest building, defecation etc.) and destroy and contaminate horticultural crops. Indian Myna's are very aggressive towards native species and our modified environment has assisted in the success of this feral species (Hanke, 2013).

Other pest birds

There are numerous species of birds not native to Australia or endemic to the region that has established populations. Some feral birds prey on a wide range of native animals including frogs, reptiles, bird eggs and even other birds and carry disease risks. Examples include the; Indian Myna, Common Starling, House Sparrow, Red-Whiskered Bulbul, Gold Finch, Spice Finch and Eurasian Blackbird etc.

Greater Sydney Local Land Services is concerned with new and emerging species which have the potential to significantly impact on biosecurity such as the House Crow, Canada Geese, Cape Barren Geese and the Indian Ringneck. If new incursions are found within the region, they will be investigated and controlled where possible.

Table 5.16: Indian Myna sub-regional management programs

Program/ Name Area	Assets	Activities	Main Participants
Whole Region <ul style="list-style-type: none"> Metro Peri-urban Urban Rural 	Management Category/Objective: Asset Based Protection		
	Environmental: Displaces hollow nesting native birds and other species. Harass other birds and wildlife. Economic: Damage to infrastructure and buildings. Social: Impact on human health by nesting in houses and spreading lice and increasing fire risk.	<ul style="list-style-type: none"> Support Local Government Indian Myna Control programs (where needed) Monitor effectiveness of management programs on Indian Myna populations Timeframe: Ongoing	<ul style="list-style-type: none"> Greater Sydney LLS NPWS Local Government Landholders

Table 5.17: Indian Myna community engagement activities

Outcome	Activity	Participants	Timeframe
1. Asset Based Protection	<ul style="list-style-type: none"> Increase/improve reporting of damage and sightings (FeralScan) Encourage collaboration between agencies, Councils, Landcare and land managers (where needed) 	<ul style="list-style-type: none"> Greater Sydney LLS Local Government Landholders 	Ongoing



5.9 Common Carp

Impacts

Common carp are a major environmental pest that have impacted on a wide range of native species and have added turbidity in many catchments. Almost all fish species are difficult to control once established, but species specific biological control offer some hope in controlling widespread aquatic pest species, in the same way that the Calici virus has had a big impact on rabbit numbers. Common Carp in the Greater Sydney Region fit within the Limited Action management category.



Distribution

Once confined to the Murray Darling Basin Common carp have since been introduced to many coastal catchments in NSW and now occur in every major catchment in the region. The strategy and focus of management for carp in the region will be to support any state-wide biological control programs. If new incursions are found in the region, they will be investigated and controlled where possible.

Other pest fish

Other non-native fish species such as Gambusia have become established in natural and artificial waterbodies across the region. It is important to limit the spread of these fish to new drainage systems and waterbodies by minimising actions which have the potential to allow them to move by either natural or human mediated means.

A number of other fish species sold in pet and aquarium shops across Sydney which are not currently present in external water bodies, but pose significant threats should wild populations establish are a concern for the Greater Sydney region. There is a need for ongoing reporting of new suspected incursions of these species into external waterbodies and to eradicate them where feasible.

In addition, a major effort is required to educate the suppliers of these fish and associated equipment such as pet shops and aquaria of the need for responsible ownership and management of these species.

In many cases these fish are both a threat of establishment of new fish populations and also a potential vector for the introduction of new pests, weeds and diseases into native fish and natural ecosystems.

5.10 Other Non-Indigenous Animals

Overview

Non-indigenous animals (also referred to as non-native or exotic), have been introduced into Australia from European settlement. Commercial livestock brought over by European settlers include cattle, pigs, horses and rabbits, all of which have established free living populations and are considered pest species in some instances.

Impacts

Over time, increasing numbers of Non-indigenous Animals have been introduced into Australia through illegal, legal and accidental pathways. These non-indigenous animals pose a significant threat to Australia's environment, community and economy. They pose a significant threat to biosecurity through spreading exotic diseases, some of which are zoonotic (can spread to humans), can cause vehicle incidents and impact negatively on the environment and agricultural production through predation, destroying crops, destruction of habitat and competition with native and production animals for food and shelter.

Control

In Australia the importation of live animals is controlled by the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), and the *Quarantine Act 1908*. The importation of animals such as the African Hedgehog,

Red-eared slider turtle, Veiled chameleon, American corn snake and Boa constrictor is classed as a Prohibited Dealing under the *Biosecurity Act 2015*. It is an offence to keep this species unless authorised, for example under the *Exhibited Animals Protection Act 1986* or *Animal Research Act 1985*. Control programs of species such as the Red-eared slider turtle are organised by the NSW DPI or in accordance with the National Environmental Biosecurity Response Agreement.

Unusual animals found in the wrong place or illegal activities such as the movement, keeping, breeding and sale of controlled category non-indigenous animals must be reported to the NSW Government as soon as possible.

To report unusual sightings go to: <https://www.dpi.nsw.gov.au/biosecurity/forms/report-an-unusual-animal-sighting> or phone the Invasive Plants and Animals Enquiry Line: 1800 680 244

Other programs

Greater Sydney region is highlighted as a gateway for Non-indigenous Animals to enter NSW and Australia. In order to enhance the current surveillance effort and to provide early detection of plant and animal pests and diseases, Greater Sydney Local Land Services has entered into an Agreement with four Local Councils and the NPWS located near Port Botany. These agencies manage significant areas of public land either adjacent to the Port or are linked to the Port via waterways.

The Agreement ensures that selected staff are trained in recognising Non-indigenous Animals and potential host plants, areas deemed as high risk within their boundaries and how to report suspected pests. The Agreement allows for annual training for staff and requests annual reporting of areas actively surveyed as a part of their normal duties.

Table 5.18: Non- Indigenous Animals sub-regional management programs

Program/ Name Area	Assets	Activities	Main Participants
Whole Region <ul style="list-style-type: none"> • Metro • Peri-urban • Urban • Rural 	Management Category: Prevent		
	Dependent on Non-indigenous Animal	<ul style="list-style-type: none"> • Surveillance as requested by NSW DPI (distribution, abundance, impacts) Timeframe: Ongoing	<ul style="list-style-type: none"> • LLS regions • NSW DPI • Local Government • NPWS • Landholders

Table 5.19: Non-indigenous Animals community engagement activities

Outcome	Activity	Participants	Timeframe
1. Protect	<ul style="list-style-type: none"> • Increase/improve reporting of Non-indigenous Animals to the Invasive Plants and Animals Enquiry Line: 1800 680 244 • Encourage collaboration between Government Agencies, Councils and landowners (where needed) • Improve community participation and education in key areas e.g. media releases 	<ul style="list-style-type: none"> • Greater Sydney LLS • NSW DPI • Local Government • NPWS • Landholders 	Ongoing

6. Measuring success and continuous improvement

The development and monitoring toward key performance indicators (KPIs) is a critical component of this plan. Monitoring indicators provide information needed to:

- identify priorities for immediate and future management planning
- evaluate previous or current programs (including both control and community engagement activities)
- improve understanding and knowledge about pest animal densities, current and potential range and their current and potential impacts
- raise community awareness of current and potential problems and opportunities for prevention and control.

Objectives and performance indicators will be set for each of the pest and programs are outlined in chapter 6.1 below.

6.1 Key performance indicators

Key performance indicators (KPIs) will be set to ensure practices are effective and achieving outcomes. These are focussed at a regional scale to ensure the implementation of programs deliver effective outcomes for the pest animals outlined in the plan. State-wide objectives and metrics for key species and goals will be formulated over the next 12 months to ensure a collaboration of regional planning efforts. These state-wide objectives will align with overarching goals and objectives set across plans and will be informed by overarching plans such as the *NSW Invasive Species plan* and *NSW Biosecurity Strategy*.

The KPIs set in this plan will be monitored and reviewed annually to ensure targeted progress on key programs and pest animals. This section will address how monitoring and evaluation of the KPIs will take place and the review of the plan for continuous improvement.

Greater Sydney Local Land Services will develop KPI's over the first year of the Plan to measure success in the plans activities which will include:

- Engagement with Local Government participants
- Surveillance operations for new incursions
- FeralScan records of pest animals
- Number of successful programs this Plan has supported
- Capacity building - media and communication/education programs
- Support of state-wide programs e.g. coordinated virus releases
- Eradication/containment of pest animal populations (where feasible)

6.2 State-wide KPIs

Providing a coherent story about the impact of the RSPAMPs across the State will require a coordinated Monitoring, Evaluation, Reporting and Improvement (MERI) framework. This will focus regional MERI programs to targeted evaluations on important outcomes which will be able to be aggregated to a State level to provide information on progress on pest animal density and distribution and its impact on economic, social and environmental issues.

Objective	Indicator	Timeframe
Develop consistent state-wide pest animal data metrics	Metrics are developed and RPACs are reporting on the metrics in a consistent manner	Implemented by July 2019
Develop a consistent MERI process for RSPAMPs	MERI process established to guide monitoring and management of pest animals in NSW for oversight by SPAC	Implemented by July 2019

6.3 Measuring performance

Reporting will occur on an annual basis based on the KPIs identified in this plan. A formal monitoring, evaluation, reporting and improvement process will be implemented by July 2019 to improve regional and state-wide collaboration and reporting on pest animal indicators across NSW. Improved intelligence on key pest animals will lead to more efficient management tools and outcomes.

6.4 Plan review

A mid-term review of this plan will be undertaken at year three (2021) and a full review will be undertaken nearing the end of the five-year term for this plan (2023).



7. The *Biosecurity Act 2015*

The *NSW Biosecurity Act 2015* is a piece of legislation that allows improved management of biosecurity risks in NSW to enable landholders, community, industry and Government to effectively manage and respond to biosecurity incursions and risks.

A fundamental principle of the *NSW Biosecurity Act 2015* is that biosecurity is everyone's responsibility. All land managers, regardless of whether on private or public land, have the same responsibilities. Likewise, the general community have a role to play in reducing risks through their activities and as 'eyes and ears' on the lookout for any potential new risks. A general biosecurity duty under the Act requires that anyone who knows or ought to reasonably know about a biosecurity risk has a duty to prevent, eliminate or minimise that risk as far as reasonably practicable.

The *NSW Biosecurity Act 2015* includes a number of mechanisms (regulatory tools) that can be used to manage biosecurity risks such as pest animals in NSW. Landholders, industry and community should be familiar with these tools and what they require of them in their daily practices.

Further information in the NSW Biosecurity legislation can be found at the NSW DPI website - <http://www.dpi.nsw.gov.au/biosecurity/biosecurity-legislation>

Regulatory tools: NSW Biosecurity Act 2015

Biosecurity Regulation 2017 - Biosecurity Regulation (NLIS) 2017 - Biosecurity Order (Permitted Activities) 2017



General Biosecurity Duty: Managing the impact and spread of pest animals.
E.g. You are discharging your GBD if you are implementing an on-farm biosecurity plan

Biosecurity Management Tools

PROHIBITED MATTER	Listed in Schedule 2 of the Act. It is an offence to deal with prohibited matter. If a person becomes aware of, or suspects the presence of prohibited matter they have a duty to prevent, eliminate or minimise the risk or potential risk it may cause E.g. Hendra Virus, Foot and mouth Disease, Avian Influenza
CONTROL ORDER	Can be made by the Minister or delegate to establish a control zone, establish measures in connection with a control zone to prevent, eliminate minimise and manage a biosecurity impact. e.g. Disposal of contaminated stock to prevent entering the food chain
PROHIBITED DEALING	A dealing with biosecurity matter described in Schedule 3 of the Act. e.g. Non indigenous animals such as African Pygmy Hedgehog
BIOSECURITY ZONES	A zone established to a premises, specified area or part of the state to prevent, eliminate, minimise or manage a biosecurity risk or impact. Generally used where longer term management is required. e.g. Phylloxera Exclusion Zone in Riverina
BIOSECURITY DIRECTIONS: GENERAL	Issued by an authorised officer to the general public or class of persons e.g. at a sale yard
BIOSECURITY DIRECTIONS: INDIVIDUAL	Issued to a single person by an authorised officer, either orally (followed up in writing within 7 days) or by notice in writing. e.g. A direction to a landholder to implement Foot rot program
BIOSECURITY UNDERTAKINGS	A negotiated set of actions agreed to by an individual and accepted by an authorised officer. Both parties are signatories

Figure 7.1: Regulatory tools of the *NSW Biosecurity Act 2015*.

8. Further information

Plan to manage biosecurity risks

This plan can be used by landholders and community members to understand manage and mitigate risks associated pest animal management in the region. Organisations may choose to apply for funding/allocate resources to support strategic pest animal projects.

The activities outlined in this plan can be used by relevant landholders and community members in the area as guidelines for discharging their general biosecurity duty to improve pest animal management. Pest animal requirements under the **Biosecurity Order Permitted Activities**, which is updated from time to time, should also be considered by landholders and the general community.

Use this plan as a guide to mitigate your risks in your on-farm biosecurity plan to ensure you are effectively managing pest animals in the most effective and efficient manner.

Educate yourself

While this plan sets a benchmark for integrated pest animal management across the region, there are a number of alternative mechanisms that can be used to meet individual's general biosecurity duty. Individuals are encouraged to utilise the following resources as well as contact their Local Land Services office for further information.

Resources:

- Greater Sydney Local Land Services
- Office of Environment and Heritage
- Department of Primary Industries
- Centre for Invasive Species Solutions
- PestSmart Connect
- FeralScan

Monitor your environment

- Be aware of changes in the landscape around you.
- Report anything unusual. If you become aware of unusual animals in the wrong place or illegal activities such as the movement, keeping, breeding and sale of controlled category non-indigenous animals, report it as soon as possible.
- Discuss ongoing monitoring programs and techniques with Local Land Services.
- Ensure you keep up to date with any Government and industry changes.

Comply

- Ensure you meet the requirements set out in both your on-farm biosecurity plan and any other on farm biosecurity plans for properties you deal with.
- Ensure you are aware of and comply with specific legislation for pest animals.

Useful links

Local Land Services

- Greater Sydney LLS homepage: <https://greater-sydney.lls.nsw.gov.au/>
- Greater Sydney pest animal information: <https://www.lls.nsw.gov.au/biosecurity/pest-control>

Local Government

- To find your Local Council homepage which contains useful information on your local area: <https://www.olg.nsw.gov.au/find-my-council>

NPWS/OEH

- General pest animal information: <http://www.environment.nsw.gov.au/pestsweeds/pestanimals.htm>
- Regional pest animal management strategies: <http://www.environment.nsw.gov.au/pestsweeds/regionpestmanagement.htm>
- Saving Our Species (a state-wide program that aims to secure threatened plants and animals in the wild in NSW) <http://www.environment.nsw.gov.au/Topics/Animals-and-plants/Threatened-species/Saving-our-Species-program>

Pests

- PestSmart: <https://www.pestsmart.org.au>
- Centre for Invasive Species Solutions: <https://invasives.com.au/>
- FeralScan: <https://www.feralscan.org.au/>
- NSW DPI Pests: <https://www.dpi.nsw.gov.au/biosecurity/vertebrate-pests>
- NSW Wild Dog Management Strategy 2017-2021: <https://www.dpi.nsw.gov.au/biosecurity/vertebrate-pests/legislation/state-strategies/management-strategy>

Non-indigenous animals

- General information on non-native animals: <https://www.dpi.nsw.gov.au/animals-and-livestock/nia>
- Report an unusual animal sighting online form: <https://www.dpi.nsw.gov.au/biosecurity/forms/report-an-unusual-animal-sighting>
- Legislation
- *NSW Biosecurity Act 2015*: <https://www.legislation.gov.au/Details/C2017C00303>
- *Companion Animals Act 1998*: https://www.legislation.nsw.gov.au/#/view/act/1998/87_
- *NSW Biodiversity Conservation Act 2016* - https://www.legislation.nsw.gov.au/~/_view/act/2016/63_
- *Exhibited Animals Protection Act 1986*: <https://www.legislation.nsw.gov.au/#/view/act/1986/123>
- *Game and Feral Animal Control Act 2002*: <https://www.legislation.nsw.gov.au/#/view/act/2002/64>
- Threat Abatement Plan for predation by feral cats (2015): <http://www.environment.gov.au/biodiversity/threatened/publications/tap/threat-abatement-plan-feral-cats>

9. List of Abbreviations

ACOs	Authorised Control Officers
AHIMS	Aboriginal Heritage Information Management System
CCWDP	Central Coast Wild Dog Plan
CPE	Canid Pest Ejector
CTLLS	Central Tablelands Local Land Services
GLU	Game Licencing Unit
GS LLS	Greater Sydney Local Land Services
KPIs	Key Performance Indicators
LGA	Local Government Area
MOUs	Memorandum of Understanding
MWDMP	Macarthur Wild Deer Management Program
NP	National Park
NPWS	National Parks and Wildlife Service
NSW DPI	New South Wales Department of Primary Industries
OEH	Office of Environment and Heritage
PCO	Pesticide Control Order
RHDV	Rabbit Haemorrhagic Disease Virus
RPAC	Regional Pest Animal Committees
RSPAMP	Regional Strategic Pest Animal Management Plan
SE LLS	South East Local Land Services
SCA	State Conservation Area
SN VPAC	Sydney North Vertebrate Pest Animal Committee
SOS	Saving our species
SPC	Supplementary Pest Control
SSAA	Sporting Shooters Associated of Australia
TAP	Threat Abatement Plan
UUFAG	Urban Feral Animal Action Group
WPAs	Wildlife Protection Area

References

- Australian Government (2013), Threat abatement plan for predation by the European red fox – Five year review. Department of the Environment.
- Department of Primary Industries NSW (2016), The pest animal data has been sourced from NSW Government agencies and collated by the NSW Department of Primary Industries in 2016.
- Hanke, Bill (2013), Response Strategies for the Common (Indian) Myna. Canberra Indian Myna Action Group.
- New South Wales Department of Industry (DPI) (2017), NSW Wild Dog Management Strategy 2017-2021, https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0004/445234/NSW-Wild-Dog-Management-Strategy-2017-2021.pdf
- New South Wales Department of Primary Industries (DPI) (2018), Vertebrate Pesticide Manual https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0008/713879/Vertebrate-Pesticide-Manual-2018.pdf
- New South Wales Office of Environment and Heritage (OEH) (2013), Regional Pest Management Strategies <http://www.environment.nsw.gov.au/pestsweeds/RegionPestManagement.htm>
- New South Wales Scientific Committee (1998), Predation by the European red fox – key threatening process. Final determination.
- New South Wales Scientific Committee (2000), Predation by feral cats – key threatening process. Final determination.
- New South Wales Scientific Committee (2002), Competition and grazing by the feral European rabbit – key threatening process. Final determination.
- New South Wales Scientific Committee (2005), Herbivory and environmental degradation caused by feral deer – Key threatening process. Final determination.
- New South Wales Department of Primary Industries (DPI) (2017), Prime Fact: Zoonotic disease risk – feral pigs https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0010/455455/Zoonotic-disease-risk-feral-pigs.pdf

Photography

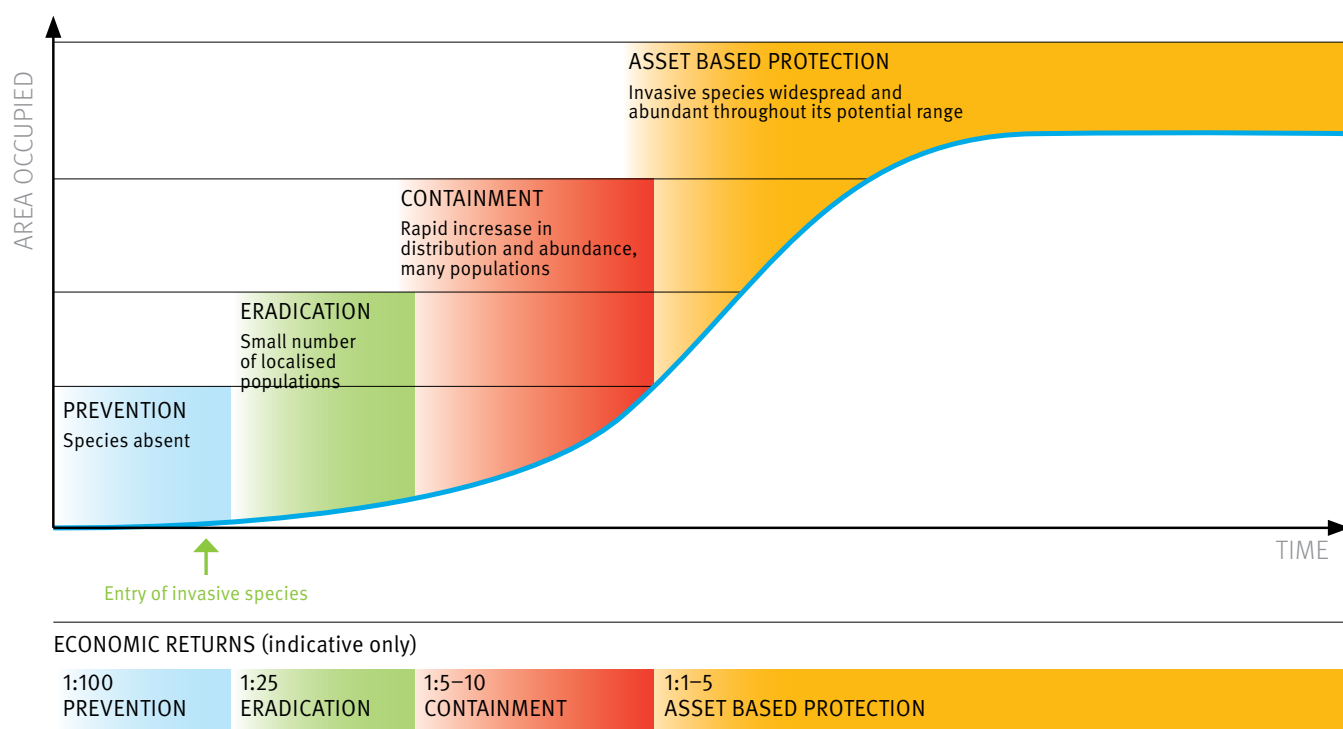
- | | | |
|---|---|---|
| Cover - Wild dog © Tim Graham | p26 Red fox © Jans Canon | p57 Feral Cat © L Deutscher |
| Cover - Feral pig © Courtesy | p29 Wild rabbits - Getty Images | p58 Sydney North Vertebrate Pest Committee © Annaliese Geddes |
| Cover - Wild Rabbit © Pest Smart | p33 Wild deer © Julien Boule | p59 Indian myna © Pest Smart |
| Cover - Cane toad © Pest Smart | p34 Mulgoa © Local Land Services | p60 Corn snake © NSW DPI |
| p2 Red fox © D Panther | p37 Feral cat © Darren Marshall | p60 Corn snake © NSW DPI |
| p5 Deer hill © Local Land Services | p38 Feral goat © Deborah Metters | p60 Corn snake © NSW DPI |
| p7 Wild Rabbit © State of Victoria | p40 Indian myna © Chris Tzaros | p60 Corn snake © NSW DPI |
| p9 Cane toad © Local Land Services | p41 Common carp © Pest Smart | p61 Cane toad © Callum McClean |
| p9 African hedgehog © NSW DPI | p41 Cane toad © Feral Scan | Back page - Red fox © David Cook |
| p9 Boa constrictor © NSW DPI | p44 Boa constrictor © Eduardo Santos | |
| p9 American corn snake © NSW DPI | p52 Wild dogs © Ash Johnson | |
| p9 Red-eared slider turtle © Benjamin Lewis | p52 Wild dog © Pest Smart (top right) | |
| p9 Veiled chameleon © NSW DPI | p53 Feral pigs © Local Land Services | |
| p9 Hog deer © Terry Whittaker | p54 Bleeding cattle for disease © Local Land Services | |
| p10 Wild dogs © Graham Wienert | p54 Red fox © OEH | |
| p15 Cane toad © Brian Gratwicke | p54 Red fox © Annaliese Geddes (bottom image) | |
| p19 Wild dog © Lee Parker | p55 Wild rabbit © Nathan Anderson | |
| p22 Feral pig © Richard Bartz | p56 Wild deer © Local Land Services | |

Appendix 1. Prioritisation Process

Public and private land managers have limited resources to manage pest animals and it is therefore important to prioritise activities. Important considerations for prioritisation are:

- It is generally more cost-effective to prevent the establishment of pest animals into new areas through prevention and early intervention (eradication or containment of small isolated populations) than to have to fund ongoing management of established species (see Figure A1).
- For established species, resources should focus on managing the pest animals and areas where there is the greatest impact on a valued 'asset' (e.g. protecting an endangered native animal from fox predation or a sheep production area from wild dogs) – this is known as 'Asset-based Protection'.
- The feasibility of management needs to be considered and this will depend on the availability of approved cost-effective control techniques and any biogeographic limitations (e.g. difficult terrain or potential impact of control techniques on non-target species).

Generalised invasion curve showing actions appropriate to each stage



*Invasion Curve sourced from Biosecurity Victoria, Department of Primary Industries, Victoria

Figure A.1: The 'Invasion Curve', showing the importance of allocating resources to prevent the establishment of new pests (Invasion Curve sourced from NSW Invasive Species Plan 2018-2021 and Department of Primary Industries, Victoria)

In developing lists of priority pest animals and management areas, RPAMPs have considered the pest animal impacts and the feasibility of effectively reducing those impacts and allocates management of particular pest animals in particular areas into one of four categories: Limited Action, Asset-based Protection, Containment or Eradication.

'Limited Action' will be the likely management approach for introduced species that aren't considered to have a significant impact in a particular area and/or for which there is currently a lack of effective management options. There are 64 terrestrial and freshwater aquatic exotic vertebrates that have established wild populations in NSW; however, many of these will fall into the 'Limited Action' category and the focus of RPAMPs will be on a much smaller list of high priority pest impacts.

'Eradication' or 'Containment' are generally only realistic management options for new incursions and small isolated populations of species where this is a good selection of control techniques available.

Appendix 2. Greater Sydney Regional Pest Animal Programs - 2018

Central Coast

- Central Coast Wild Dog and Fox Control Program
- Central Coast Fox Baiting Program
- Ourimbah Creek Fox Baiting Program
- NPWS Wild Dog Control Programs in Brisbane Water, Watagans, Dharug, Popran National Parks Jiliby State Conservation Areas (SCA)
- NPWS/ OEH SOS / Fox TAP Fox Control Programs in Watagans, Yengo (St Albans sector) Wyrrabalong National Parks and Tuggerah Nature Reserve

South West

- Macarthur Wild Dog and Fox Control Program
- Menangle Fox Control Program
- Barrallier Wild Dog and Fox Control
- Macarthur Wild Deer Management Program
- NPWS Wild Dog Control Programs in Nattai National Park, in the Burratorang SCA and Thirlmere Lakes NP
- NPWS Pig Control Program southern Blue Mountains

North West

- Upper Hawkesbury Wild Dog and Fox Control Program
- Megalong Wild Dog and Feral Pig Control Program
- Mulgoa Fox Baiting Program
- Bilpin Fox Control Program
- Hills Shire Rabbit Baiting Program
- NPWS Deer Control Program Scheyville NP
- NPWS coordinated responsive Kurrajong Hills Wild Dog Control Program in Wollemi NP

Metro

- Sydney North Vertebrate Pest Committee coordinated (fox, rabbit) control programs
- Sydney South Vertebrate Pest Committee coordinated (fox, rabbit) control programs
- NPWS/ OEH SOS / Fox TAP Fox Control Programs at Ku-ring-gai Chase, Garigal National Parks, at North Head and Towra Point
- NPWS Deer Control Program Royal NP

State-wide

- RHDV Rabbit Baiting Programs

Appendix 3. Case Studies

The following case studies provide examples of pest control programs or challenges faced when managing pest animals in Greater Sydney region. They have been included to assist the various communities across this region to understand the need for and practical measures required to achieve effective pest management, particularly in the urban and peri-urban parts of the region

Wild Dogs

Wild dogs are a significant problem throughout the Greater Sydney region. In the Central Coast area, Wild Dogs occur predominately west of the M1 motorway, impacting on livestock, in particular sheep production. However, within a peri-urban context, domestic dogs have also been responsible for stock loss. These dogs have either hybridised with dingoes/wild dogs, are feral or are free roaming domestic pets. In order to reduce the negative impacts of these dogs on agricultural production, remote camera monitoring is essential to understand their behaviour, determine their origin and assess control options.

If the dogs attacking livestock are domestic pets, control methods such as cage trapping are likely to be implemented and are typically dealt with by Local Government under the Companion Animals Act 1998. If the dogs are wild dog hybrids or wild dogs, best practice control methods such as 1080 baiting or leg hold trapping are implemented through coordinated and strategic control programs.

Media articles are generated through local newspapers raising awareness to this issue and encouraging responsible pet ownership practices. Promotion of these control programs in the local media also helps to raise public awareness around these issues in encouraging responsible pet ownership practices.



Figure 2.1: Wild dog hybrids captured on remote cameras on a sheep property in the Central Coast.

Feral Pigs

Megalong Valley is small rural community situated in the Blue Mountains LGA. Located 124km from Sydney and west of Katoomba, Megalong Valley is primarily an agricultural production area and a popular tourist destination for avid bushwalkers.

Feral pigs are established in the area and impact on agricultural production by destroying vineyards, pastures, spreading weeds, digging up dams/riverbanks, predating on livestock, damaging native flora and fauna and posing a significant disease risk to the broader community.

Greater Sydney and Central Tablelands Local Land Services have been coordinating a strategic vertebrate pest control program in the area over the past three years. Involving a number of local land managers, the program objective is the protection of important agricultural production enterprises and biodiversity.

Feral pigs are managed in the area mainly through cage trapping. Once the pigs have been dispatched humanely on site, blood samples are taken from each pig to test for diseases such as *Brucella suis* and *Lepotspirosis*, diseases which are known to impact upon humans and animal health.

The success of the program and support from landholders involved has seen the program expand into controlling other vertebrate pests such as wild dogs. Biosecurity Officers have trained over 20 local producers in a Vertebrate Pesticide Training Course. Once completed, this course permits landholders to effectively and safely handle 1080/Pindone baits and Canid Pets Ejectors (CPE's) to control pest species on their land.

This control program is also coordinated with NPWS pig control programs which operate within the area. An aerial shooting operation is undertaken bi-annually targeting these introduced pests, but also controlling other invasive species during the operation. A winter 1080 strategic ground baiting program is carried out annually and is followed up by a cage trapping program.



Figure 2.2: Landholder engagement and feral pig control in the Megalong Valley

Red Fox

Red foxes predate heavily on sheep, backyard poultry, impact biodiversity and are a major problem in agricultural, semi-rural, peri-urban and urban areas of the Greater Sydney region. Controlling foxes in Greater Sydney provides a unique challenge to land managers and those controlling their populations due to restrictions outlined in the 1080 PCO.

In early 2016, the Menangle Fox campaign was formed by Greater Sydney Local Land Services along with a number of project partners to coordinate a landscape approach to managing foxes in a peri-urban area.

The campaign aims to run twice a year in autumn and spring and uses best practice control methods such as 1080 baiting/CPE's, cage trapping and shooting. Greater Sydney Local Land Services hold regular Vertebrate Pesticide training courses to assist land managers who can meet the 1080 PCO requirements to gain their five year accreditation in order to lay 1080 baits.

Various stakeholders are actively involved in the campaign including Barragal Landcare, Campbelltown Council, Wollondilly Shire Council, Camden Council, the Australian Government and the National Landcare Program. Meetings are held before each campaign allowing land managers to take ownership of the program, share ideas and present on their experiences in managing foxes on their land. Landholders are encouraged to monitor fox distribution and abundance on their land using remote cameras and FeralScan.

As part of the campaign a number of scientific research projects are being conducted by Greater Sydney Local Land Services and students from Western Sydney University. Projects include disease risks to livestock - particularly dairy herds contracting *Neospora caninum* from foxes, dietary analysis of foxes which looks at stomach/scat contents and tracking fox movements across the landscape using GPS collars. Citizen science also forms part of the campaign, with volunteers helping to tag wildlife photos captured from remote cameras and collecting scats for diet analysis.

<https://www.feralscan.org.au/foxscan/menanglefox>



Figure 2.3: Greater Sydney Local Land Services District Veterinarian and Biosecurity staff bleeding cattle to test for diseases spread by foxes and a fox preying on wildlife.

Wild Rabbit

In highly urban areas, wild rabbits cause damage to suburban parks, picnic areas, sports fields, residential gardens, nature strips, footpaths and road verges. Canterbury-Bankstown Council took a proactive and integrated approach to rabbit control, using a combination of best practice and biological control techniques to help reduce the feral rabbit population and minimise the damage they cause in their LGA.

Fumigation and trapping had proven unsuccessful in a high priority area within the LGA (Milperra), so a controlled baiting program was conducted in June 2016 at Newlands Reserve. Pindone poison was used and an 80% reduction in the rabbit population was achieved. Whilst effective at Newland Reserve, the Pindone baiting program had little impact elsewhere in Milperra.

The next stage of rabbit control was to evaluate the effectiveness of using a biological control method. The Council participated in the national Boost RHDV-K5 program in March 2017. It was the release of a new strain, a Korean strain (K5) of Rabbit Haemorrhagic Disease Virus (RHDV1) otherwise known as Calicivirus, which is rabbit specific. Due to inclement weather at the time of the national RHDV-K5 release, the impact of the RDHV release could not be determined with certainty at the target sites although reports suggest there may have been a 20 – 40 percent decline in rabbit numbers state-wide.

For rabbit control programs to be effective in urban areas, community support is essential. Canterbury-Bankstown Council provided information to the public about the RHDV-K5 release, the importance of vaccinating pet rabbits, leaving bait material on the ground for feral rabbits to consume; reporting any deceased rabbits to the Council for disposal and reporting rabbit sightings through the FeralScan.



Figure 2.4: Wild rabbits impacting on pasture (Image (NSW DPI n.d))

Wild Deer

Wild deer are established throughout the Macarthur, a region in south-west Sydney encompassing the Wollondilly, Campbelltown and Camden LGA's. Deer are present in low to moderate numbers in this area, however increased concerns by the local community resulted in Greater Sydney Local Land Services implementing a strategic and coordinated deer control program to protect agricultural production, damage to private property, environmental assets and improve public safety.

Greater Sydney Local Land Services established the Macarthur Wild Deer Management Program (MWDMP) in November 2017 in partnership with the key local governments. It involves over 35 private landholders. A number of stakeholders are also actively involved in the planning stages of the program and include the Camden, Wollondilly LGA's, NSW Police, RSPCA, Camden airport and Landcare groups.

From the onset, Greater Sydney Local Land Services engaged the local community with the 'Macarthur Wild Deer Management – Community Survey'. Results from this, along with local contacts and reports from landholders were used to identify 35 private landholders willing to set up trail cameras on their property for pre and post monitoring purposes. The MWDMP Operations Coordinator then undertook pre-participation property inspections to assess their suitability for inclusion in the program. Detailed risk assessments were then undertaken at each property deemed suitable to ensure the proposed control operations could be conducted safely.

Ground shooting has been determined as the preferred control method for the MWDMP, with Biosecurity Officers from Greater Sydney Local Land Services and suitably qualified, licensed and professional contractors undertaking the operations component of the program. All carcasses that are able to be retrieved will be taken from the shooting site and utilised for animal consumption at a local wildlife park.

The program is expected to attract significant media attention, which will be managed through the Greater Sydney Local Land Services Communications Officer. Community engagement through newsletters, social media and newspaper articles will also occur throughout the duration of the control program to keep the broader community up to date.

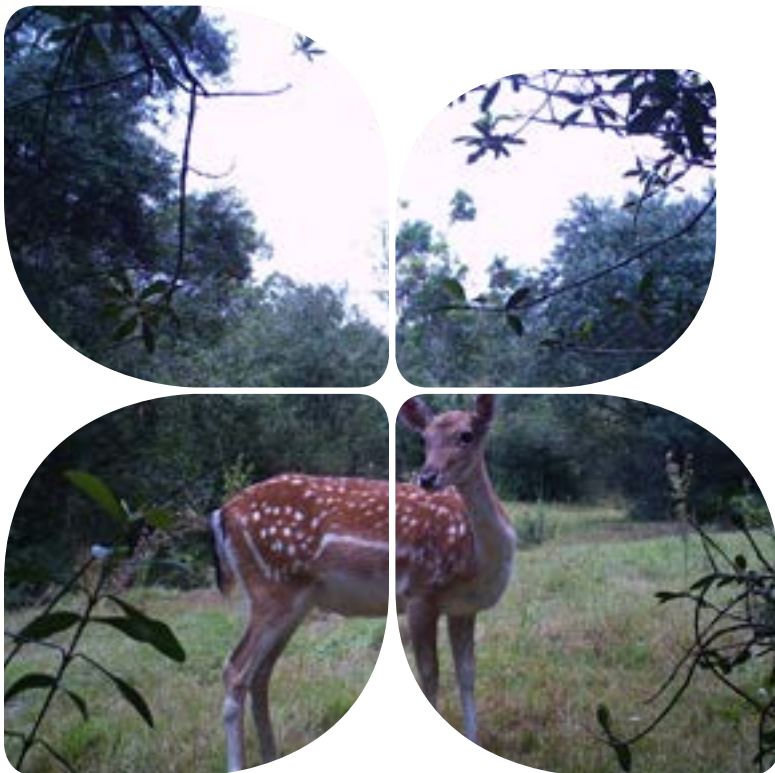


Figure 2.5: A wild deer fawn captured on a remote camera as part of the pre-control program monitoring.

Cats

Cats are the second most common type of pet kept in Australian households with nearly 3/10 households owning one (2.7 million). Cats are known to be a key factor in the decline of our native animal populations. Research indicates cats are exceptional hunters and in urban environments they make repeated visits to successful hunting grounds, typically nature strips and local reserves. In urban areas the number of domestic cats that regularly visit neighbouring bushland areas can outnumber feral cats and therefore have a greater impact on native animals. Cats do not have to be hungry to hunt and many owners are unaware that their cats attack native wildlife.

Australian wildlife is also vulnerable to the parasitic infection toxoplasmosis, which is transmitted by cats and can cause blindness, damage to the central nervous system and damage to respiratory organs in both people and other animals. Native wildlife rarely survive cat attacks due to the harmful bacteria found in cats mouths. Furthermore, research shows that cat curfews, de-sexing and bells on collars are not effective in protecting native animals.

Following the passing of the *Companion Animals Act 1998*, Local Government staff commenced the 'Cats in Council Managed Urban Bushland' initiative. The initiative aims to boost community awareness around the natural environment, highlight the importance of native fauna, foster responsible pet ownership and open the way for future environmental initiatives through non-confrontational education. With the assistance of a community education plan and a cat trapping program, Councils were able to declare bushland reserves as Wildlife Protected Areas (WPA's). This declaration prohibits cats from entering WPA's and allows Council officers to trap feral and domestic cats within the declared reserves. Within the first year, 28 cats were removed from WPA bushland reserves.

Northern Beaches Council has expanded its cat management program now called 'Protect your Cat, Protect your Wildlife'. The LGA has over 20 declared WPA reserves. The Council has set up a trap hire program allowing residents experiencing problems to trap nuisance cats. Once trapped, the animal is taken to the local vet for assessment. For these types of programs to be effective, community support is essential. Northern Beaches Council provides education and support to the public about responsible pet ownership including the importance of keeping cats on their property and out of bushland areas and how to 'Protect your Cat, Protect your Wildlife'.



Figure 2.6: Feral cat walking in bushland

Sydney North Vertebrate Pest Committee

In 1998 the Urban Feral Animal Action Group (UFAAG) was established with the aim to share information, raise community awareness, and educate agency members on the impacts of urban feral animals. The group comprised of 19 local councils and government agencies from across Sydney North.

The group's initial focus was to develop and implement the Sydney North Regional Fox Control Program. In 1999, six local councils and the National Parks and Wildlife Service put in a request for an NRA Agvet Chemicals Permit to allow 1080 baiting of foxes within selected bushland reserves in areas more than 150 m from habitation (the 1080 permit originally had a minimum distance of 500 m from habitation). The permit was granted and the multi-agency, multi tenure fox control program commenced.

Within a couple of years agencies were reporting a decline in fox populations. Through a formal fox activity monitoring program and native fauna surveillance, officers were able to measure native species abundance and project success. The UFAAG then commenced other urban feral animal management initiatives including; rabbits (both European wild rabbits and stray domestic rabbits), cats (feral, stray and domestic) and Indian Myna birds.

Since its establishment in 1998, UFAAG has successfully implemented numerous urban feral animal control programs, developed educational material and management plans and run training programs for agency members and the community.

In 2017, the group was renamed 'Sydney North Vertebrate Pest Committee' to align with the *NSW Biosecurity Strategy 2013-2021*. This committee will work alongside the Greater Sydney Regional Pest Animal Committee to assist in the delivery of the new regional planning approach, regional pest animal management plans and help promote community engagement and land manager capacity building within their part of Sydney.



Figure 2.7: Greater Sydney Local Land Services coordinated Calicivirus virus release with stakeholders as part of the UFAAG group, which is now known as Sydney North Vertebrate Pest Committee

Indian Myna

In North Sydney, the Indian Myna (or Common Myna) is an established, widespread invasive species. Widely disliked, Indian Mynas detract from the amenity of both public and private open space in several ways. The most common complaints North Sydney Council receives regarding Indian Mynas include:

- Noise and mess caused by communal roosting, where groups of up to thirty or forty birds congregate in a single tree around late afternoon, vocalizing until dark and fouling the ground beneath the tree
- Foraging around outdoor eating areas (i.e. parks, restaurants, cafes, private backyards etc) and fouling outdoor furniture - this has obvious implications for human health.
- Nesting in roofs and other man-made structures, which causes fouling and can increase fire risk through the accumulation of flammable materials

In highly urbanised areas, like North Sydney, Mynas are considered to mainly be a pest in terms of property damage/fouling and public amenity. Although, competition for scarce nesting habitat can impact native wildlife to some extent, this impact is somewhat offset by the adaptability of Indian Mynas and their ready use of structure voids, as opposed to natural hollows, for nesting and breeding purposes. Within North Sydney's core bushland areas, Indian Mynas are rarely recorded so management activities focus resources where they are most useful to the community and the problems Mynas cause.

North Sydney's Indian Myna Community Action Program provides access to information and resources (including trap-building plans; ethical trapping procedures and details of supportive local vets) on Council's website. Council also hosts a free-to-attend Indian Myna trap building workshop each year to help those in the community interested in carrying out their own humane trapping program. In addition to this program, Council encourages the greater use of native plants in home gardens through the Native Havens Program. Enhancing habitats that favour our native wildlife helps support viable populations and reduced their susceptibility to competition with Indian Mynas. This community engagement approach to landscape-scale connectivity is further strengthened through Council's strategic bushland rehabilitation and green corridor activities.



Figure 2.8: Indian Myna birds in an urban park in Sydney. Image (NSW DPI n.d)

Corn Snakes

The American corn snake is a snake species of which originates from Mexico and southern parts of the United States. It is a small to medium size snake which can grow up to 1.8m in length and comes in unusual colour variations due to selective breeding.

Corn snakes can live longer than 20 years and are identified as a successful invasive species due to established populations already occurring in the Virgin Islands, Bahamas and Cayman Islands. Similarly, these snakes are highly agile and are known for escaping out of enclosures of keepers and can easily adapt to living in semi-urban areas, agricultural land, grassland and forest areas. Corn snakes constrict their prey, with their diet consisting of ground nesting birds, lizards and rodents.

Corn snakes were once sold in pet shops. This is now prohibited under national biosecurity laws. In NSW, corn snakes are being kept illegally, with reports and sightings coming in regularly to NSW DPI due to the animals escaping from enclosures or being released. A tourist recently reported a sighting to NSW DPI who found the snake in a toilet in Cremorne. A number of other sightings have been reported in Ashfield, Helensburgh, Kincumber, Bomaderry, Shellharbour, Glenbrook and Dapto.



Figure 2.9: Corn snake samples from which have been identified by NSW DPI experts. Image (NSW DPI n.d)

Corn snakes are also a threat to the Australian agricultural industry as they have the potential to carry bacteria that can cause sickness or kill grazing animals. These snakes also pose a threat to humans as they are known carriers of the cryptosporidium parasite. To report sightings of a corn snake phone the Invasive Plants and Animals Enquiry Line: 1800 680 244.

Cane Toads

Originating from South America, Cane Toads were introduced into Queensland in 1935 in an unsuccessful attempt to control a pest of the sugar cane industry, the cane beetle. Having no natural enemies, the toads spread rapidly into NSW and the Northern Territory, impacting on native fauna due to the toad's deadly toxins, potential zoonotic disease spread and predation. Cane toads are known to out compete native amphibian species for resources such as habitat and food.

In 2008, cane toads were reported in the Sutherland Shire LGA, where they were likely transported via motor vehicles from Northern NSW or Queensland. By 2010, more than 200 toads were disposed of within the LGA, with the main concentration in the Taren Point industrial area. Sutherland Shire Council liaised with councils and experts in Northern NSW who deal with cane toads regularly, along with NPWS who were also engaged for advice and resources.

The aim by Local Government and associated organisations was to eradicate the isolated cane toad breeding population, develop a regional cane toad action group and assist in the developing best practice control and detection techniques. Staff and community volunteers throughout 2010 and 2011 undertook monthly surveys to detect cane toad presence and removal of individuals using spotlight and auditory equipment. A specialised cane toad sniffer dog was also involved in the eradication program, with surveys extending into Towra Point Nature Reserve and Kurnell Peninsula. Sydney University attached small transmitters onto adult toads to help detect tadpole/breeding sites. Education programs were also established and three cane toad muster was held involving Bushcare volunteers, local residents and amphibian study groups.

Between 2011 and 2013, three breeding occurrences were discovered at a number of wetlands on private property. The Sydney climate was thought to be too cold for cane toads to breed, as the nearest breeding population was on the NSW North Coast. Council staff installed containment fencing around the wetlands to prevent the spread of meta-morphs and juvenile cane toads in to surrounding properties and bushland. Cane toads were collected through manual collect and tadpole trapping and then provided to Sydney University to conduct research. Sutherland Shire Council coordinated with resident and property owners in the Taren Point, Caringbah, Cronulla and Kurnell areas, to conduct weekly cane toad surveys and to educate them on cane toad identification and collection.



Figure 2.10: Cane toad in the Greater Sydney Region. Image (Callum McClean n.d)

Since 2010, approximately 1500 cane toads and at least 5000 tadpoles were removed and have not been detected since August 2014. Despite this, Sutherland Shire Council continues to work with other agencies, experts and the community to effectively manage any detections, sightings or new incursions.

