



Eastern Region Pest Animal Strategy

2020-2030 Volume 1

This strategy has been collaboratively developed by the Eastern Region Pest Animal Network. The Network is comprised of representatives of individual Local Government Areas as well as public land managers and authorities including Melbourne Water, Parks Victoria, Port Phillip and Westernport Catchment Management Authority and the Department of Environment, Land, Water and Planning. The following organisations support this strategy. Participating organisations support the broad objectives of the strategy and will seek to collaborate on regional pest animal management. These organisations will tailor actions to suit their organisation and are not bound to undertake all actions in the strategy, but continue to work collaboratively with Network partners to achieve the vision of 'Working together to minimise the impacts of pest animals across the Region'.

Eastern Region Pest Animal Network



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We acknowledge the Traditional Owners of the land in which this strategy is based upon.
We pay our respects to their Elders, past and present.

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Abbreviations

A list of abbreviations used in this strategy can be found at the end of this document.

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The background of the page features a large, abstract geometric design. It consists of a light green area in the top left corner, a darker green area in the top right corner, and a white area in the bottom left corner. The boundaries between these colors are smooth, curved lines that create a dynamic, modern look.

Executive Summary

To mitigate and minimise the impact of pest species across the eastern Melbourne region, a coordinated, collaborative and consistent approach is needed to enable local pest management actions to have the greatest impact.

This is best achieved through a planning framework that delineates legislative responsibilities, current and potential pest problems and, provides an action plan to reduce the impact of pests on biodiversity, primary industry and social well-being.

The Eastern Region Pest Animal Strategy 2020-2030 has been developed in response to this need and establishes a region-wide planning framework to provide a clear vision, principles, regional goals, standards and protocols to guide Network members and support all stakeholders in effective management of priority pest species across eastern Melbourne.

The Strategy covers the following priority pest species:

- European Fox
- Feral Cat
- European Rabbit
- Feral Deer – Fallow, Red and Sambar deer
- Common (Indian) Myna

In preparing this Strategy, management principles and animal welfare were considered for pest animals and incorporated into the desired goals, objectives and strategic actions.

The vision ***Working together to minimise the impacts of pest animals across the Region*** will be achieved by all stakeholders working in a coordinated and collaborative way.

The Network will work to achieve the vision through the following goals:

Goal 1

Provide leadership and coordination for the management of priority pest animal species.



Goal 2

Increase awareness, understanding and capacity building regarding priority pest animal management.



Goal 3

Mitigate the impact of established priority pest animals on biodiversity, primary industry and social well-being.



Goal 4

Monitor, evaluate and report to inform and continuously improve priority pest animal management.



This Strategy will be used by Network members to develop Local Action Plans. Network members will use the Strategy to raise awareness of the joint responsibility required by all landholders to effectively manage pests. The Network will provide shared learning opportunities and facilitate collation of regional pest information. This requires ongoing commitment by all stakeholders to the monitoring and reporting of pest animal impacts, dispersal and extent, so that decisions can be based on appropriate and adequate information. A strategic planning framework is used to manage both emerging pest problems before they become major issues, and to manage the impacts of existing established pest animals. The Strategy has a lifespan of ten years with a review at the end of five years. Strategy effectiveness will be monitored and assessed according to predefined Key Performance Indicators.

1

Introduction

Pest animals have pronounced environmental, social and economic impacts in the Eastern Region. Pest animals' impact on people, businesses, agricultural productivity and biodiversity in the rural, peri-urban and urban parts of this region.

In response to the multi-faceted pest animal problem facing the region, the Eastern Region Pest Animal Network (the 'Network') was formed. The Network was established in 2016 to share learnings and develop a coordinated approach to pest animal management. The Network seeks to maximise return on investment and improve the regional ability to respond to pest animal incursions to protect key biodiversity, primary industry and social assets. The Network is comprised of representatives of individual Local Government Areas (LGA's) as well as public land managers and authorities including Melbourne Water, Parks Victoria, Port Phillip and Westernport Catchment

Management Authority (PPWCMA) and the Department of Environment, Land, Water and Planning (DELWP). These agencies jointly developed this Strategy.

In developing this Strategy, the Network recognises and supports the efforts of landholders, Landcare Groups, friends of groups and the broader community to control priority pest animals.

For the purposes of this Strategy, the definition of a pest animal is 'non-native (introduced) species that are, or have the potential to become, established in the wild through escape from captivity, deliberate or accidental release and accidental or illegal importation'.

This Strategy applies to eight priority pest species (Table 1). These species were selected due to their impacts on native biodiversity, risk to safety and production values and local community concerns in the Eastern Region.

| Priority pests | Declared status – CaLP Act 1994 |
|---|--|
| European Fox (<i>Vulpes vulpes</i>) | Established pest animal |
| Cat (<i>Felis catus</i>) | <p>Feral Declared an established pest animal on specified Crown land managed by DELWP, Parks Victoria, Phillip Island Nature Park and the four Alpine Resort Management Boards.</p> <p>Not declared on private land.</p> <p>Stray Not declared</p> <p>Domestic Not declared</p> |
| European Rabbit (<i>Oryctolagus cuniculus</i>) | Established pest animal. |
| Feral Deer ¹ 1. Fallow (<i>Cervus dama</i>), 2. Red (<i>Cervus elaphus</i>); 3. Sambar (<i>Cervus unicolor</i>) | Not declared. Defined as protected wildlife under the Wildlife Act 1975. |
| Common (Indian) Myna (<i>Acridotheres tristis</i>) | Not declared |

Table 1. Eastern Region priority pest species

These pest species are common across Melbourne's east, are increasing in extent and abundance and are having significant impacts on key assets. Effective pest management of these species involves a combination of preventing their dispersal into new areas and managing the negative impacts of those species that have become established.

This Strategy is comprised of two volumes, the first containing the strategic direction and the second containing detailed species protocols and survey results.

¹ For the purposes of this Strategy, three species of deer present in the Eastern region are referred to collectively.

1.1 Purpose of the Strategy

This Strategy provides a regional framework for vertebrate pest animal management in the Eastern Region. Effective, long-term pest animal management requires cooperation from most land managers in an area. The Strategy articulates agreed pest animal management principles and overarching objectives for regional pest management. This Strategy provides regional standards and targets to guide all stakeholders in planning and implementing on ground controls. Through effective collaboration, the Network seeks to maximise return on investment and the ability to respond to pest animal incursions to protect valued regional assets.

The Strategy aims to:

- Identify how coordinated, cooperative and effective management of pest animals can be achieved across the Eastern Region.
- Address the risks and impacts of pest animals on priority biodiversity, primary industry and social assets of the Eastern Region.
- Improve management of invasive animals through effective evaluation, monitoring and reporting.
- Identify best practice pest animal management approaches in the urban, peri-urban and regional contexts.

This Strategy has a lifespan of ten years with a review of progress at five years. This Strategy is not intended as an operational document; however, it does provide operational protocols and information standards. This will enable consistent reporting on the pest problem and facilitate ongoing improvement in regional capacity to refine operational investments. The strategy supports community capability building and engagement with this shared responsibility.

Feral Cat: commons.wikimedia.org/wiki/commons/3/3d/Feral_cat_with_galah.jpg



1.2 Study Area

The Eastern Melbourne Region covers an area of over 5,395 square kilometres. The Region comprises diverse landscapes, multiple land tenures and a mix of peri-urban and urban municipalities from across the east and south-east of Melbourne. The study area lies within the Port Phillip and Western Port Catchment Management Area and encompasses areas outside of Melbourne's urban growth area boundary. The study area contains large areas of native vegetation managed by agencies such as Melbourne Water and Parks Victoria, farmland and residential areas, coupled with, highly urbanised areas such as Boroondara Council, located only a few kilometres from Melbourne's CBD.

Bordered by the Yarra Ranges National Park to the north east, the region's landforms and vegetation communities range from dense Mountain Ash Forest and Cool Temperate Rainforest, through Plains Grassy Woodlands and native grasslands of the Victorian Volcanic Plain to remnant native bushland located in isolated reserves in the inner city. Primary industries are diverse and include livestock grazing, vineyards, orchards, timber plantations and a range of small-scale hobby farms. The region contains significant environmental assets such as the Yarra River, Bunyip State Park, Warrandyte State Park, Yarra Ranges National Park, Kinglake National Park and Dandenong Ranges National Park, inclusive of environmentally sensitive water catchment areas and the waterways.

Factors that currently influence pest animal management within the Eastern Region include restricted resources available for pest management, diversity of private and public land managers, changes in land use (i.e. increasing urbanisation), absentee land managers and small hobby farms, urban areas and public places with limited control options. Pest management is constrained by a lack of driving leadership and co-ordination across land tenure.

Management of wild deer is particularly limited by available control options (specifically in the peri-urban context), legislative protection (leading to current complexities that govern control permits) and limited funding (hampering regional control in early invasion stages in some regional locations). There are public safety concerns around the use of firearms in built up areas. Deer shooting in the more urban areas, is not permitted unless conducted by a professional with a Populous Place Permit in accordance with local orders and current legislation.

The Eastern Region borders the Goulburn Broken and West Gippsland CMA's, as well as the City of Melbourne. There are limited inter-regional co-operative programs in place for pest species with most regions undertaking their own pest control programs.

Eastern Melbourne Region

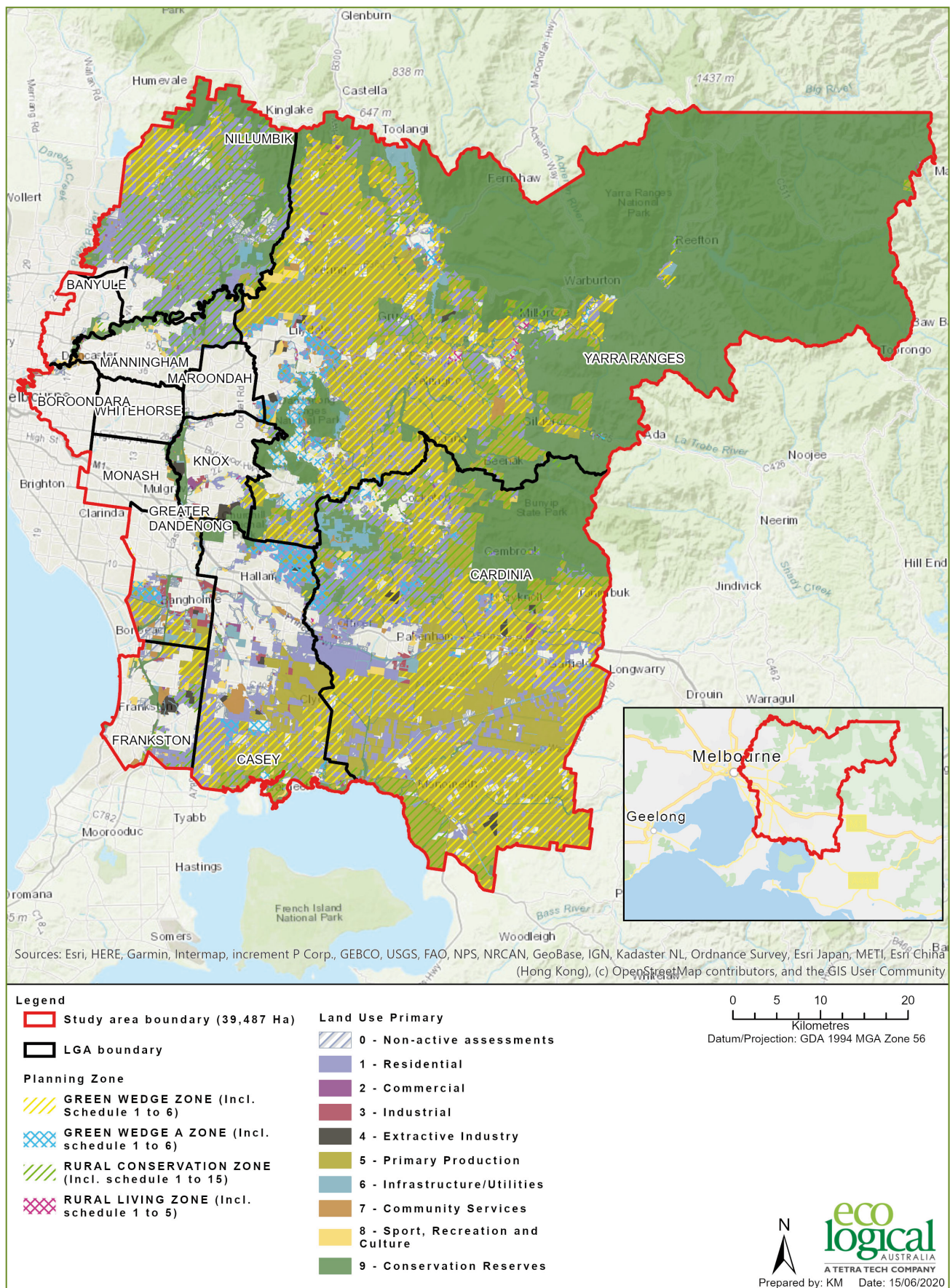


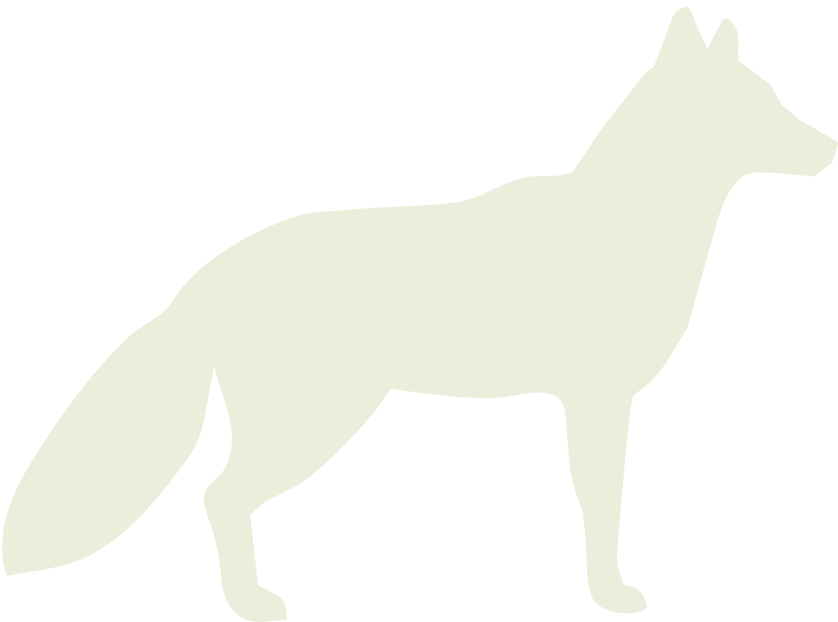
Figure 1. Study area

1.3 Network Partners

The Network has been established across Melbourne’s East, demonstrating a level of collaboration and interest in making progress on this critical issue. This voluntary network of agencies understands the cumulative value in coordinated action across tenures and the exponential benefits gained from sharing knowledge, capacity and resources to tackle pest management. The current Network members are listed in Table 2.

Table 2: Eastern Region Pest Animal Network Members

| Organisation | |
|---------------------------|---|
| Banyule City Council | Knox City Council (Network Coordinator) |
| Cardinia Shire Council | Manningham City Council |
| City of Boroondara | Melbourne Water |
| City of Casey | Nillumbik Shire Council |
| City of Greater Dandenong | Parks Victoria |
| City of Monash | Port Phillip and Westernport Catchment Management Authority |
| City of Whitehorse | VicRoads |
| DELWP | Yarra Ranges Council |
| Frankston City Council | |



1.4 How this Strategy was Developed

This Strategy has been developed with input from members of the Network. The Network has agreed on a risk management approach to pest control. This considers both the strategic benefit to biodiversity and key assets and, the return on investment by addressing incursions early in the invasion cycle.

The evidence base for this Strategy has been collated via desktop research and stakeholder consultation with a view to leverage existing knowledge in the region. Additional records from control programs, community groups and FeralScan have contributed to the knowledge base. Councils have provided high level summary data of known extent and severity of pest species. This has been informed by community records and existing, local feral management works.

Initial consultation was undertaken with Network members from October 2019 to March 2020, via an online survey, individual phone interviews and two workshops. A summary of anonymised online survey and interview results are provided in *Volume 2*.

The workshops provided an opportunity to develop and refine the Strategy's vision, guiding principles, objectives and actions. This process was overseen by the Network steering committee.

This identified:

- Current knowledge base of the extent and severity of priority pests including data gaps.
- Key assets in need of protection from priority pest animals.
- Reported impacts of pest species on natural and community assets.
- Insights from different pest control mechanisms trialed in the region.

A desktop literature review and data audit were conducted in parallel to collating stakeholder knowledge.

Eastern Region Pest Animal Network strategy development workshop



1.5 Eastern Region SWOT Analysis

A Strengths, Weaknesses, Opportunities and Threats analysis was undertaken to understand the internal and external factors affecting pest management by Network partners.

STRENGTHS

Coordination and communication between Councils, state government and public land managers is improving.

Effective partnerships developed between Councils and public land managers (VicRoads, Parks Victoria and Melbourne Water) as part of the Network.

Effective partnerships developed between individual Councils and some Landcare and 'Friends of' groups to control pests.

Long-term strategic approach to pest control steadily improving.

Existing, independently verified control methodologies and monitoring actions (e.g. Melbourne Water deer program) are in place.

Funding and in-kind assistance provided to Landcare and private landholders to implement pest control actions.

Anecdotal evidence of pest distribution, current impact and areas prone to establishment.

WEAKNESSES

Lack of baseline data on the status (extent/severity) of target pest species across the region.

Lack of effective data management within and between Councils, leading to reduced efficiency of pest control programs.

Lack of a consistent, robust and practical monitoring and evaluation framework to assess the effectiveness of pest control programs.

Lack of appropriate control methods that can be used in urban environments.

Generally, a low appetite for risk amongst community, councillors and program managers. E.g. shooting as a control measure.

Existing, independently verified control methodologies and monitoring actions (e.g. Melbourne Water deer program) that are in place are geographically restricted.

Current pest control programs are largely uncoordinated, and target known (reported) infestations or respond to community concerns. Often pest animals recolonize once control has ceased.

Insufficient awareness amongst new residents, particularly in peri-urban areas about land management including pest animals.

Minimal sharing of information (e.g. pest control methods, community education materials, pest data) between Network members

OPPORTUNITIES

Develop shared methodologies for controlling targeted pest species.

Develop an updated, shared database to store invasive species and biodiversity data.

Develop a Monitoring, Evaluation and Reporting framework to evaluate the impact of pest control across the region. Assess pest coverage and dispersal patterns to plan and implement a coordinated and control program across the region.

Engaged community using resources like Feral Scan to submit records of pest species and assist in monitoring extent and severity of target pest animals.

Opportunities to work with volunteers and local, licensed hunters.

Develop shared communications plan for use by all Councils. Enhance knowledge in the community about pest animal species, key biodiversity assets and appropriate pest control techniques.

Unified Network with shared messaging. Increased leverage and pulling power with State government and funding bodies to generate additional funding for pest control programs in the region.

Partnership programs with council members of the Network. E.g. group applications to receive grant funding.

Ensuring techniques are the most practical, cost effective and humane for pest animal control.

THREATS

Changes in temperature, rainfall and fire associated with climate change is likely to result in changes to the severity and extent of pest animal species.

Spread of pest animals from adjoining private land has the potential to undermine Council and public land manager control actions.

Potential low impact of control options on cats which are undeclared pest animals unless located on Crown land.

Deer expansion in urban and peri-urban areas increases public safety risk.

Low participation in reporting, monitoring and implementation of pest control actions by private landholders and community.

Change in legislative context could require a review of the Strategy.

Lack of guarantee around level of State funding for pest animal management.

Participation in Eastern Region Pest Animal Network ceases resulting in lack of governance and coordinated regional approach to pest management.

Community members who are poorly informed or idealistically opposed to pest control can disrupt control programs.



Image: David Croft/Department of Planning, Industry and Environment

2

Governance Framework

The Strategy has been developed within the context of a broad range of National and State legislation, policy, strategies and plans relevant to the management of pest animals.

2.1 Legislative Context

The *Catchment and Land Protection Act 1994* (CaLP Act) is the principle legislation regulating the management of pest animals in Victoria. Under the *CaLP Act* all landowners have the responsibility to take all reasonable steps to prevent the spread of, and as far as possible, eradicate pest animals on their land. Specific regulations apply to pest categories defined in Part 8 (s64-s67) as shown in Table 3.

| Group | Category | Requirement |
|----------------------------|--|--|
| 'Restricted' pest animals | 'Prohibited' pest animals may be declared by the Minister if the species did not occur naturally in the wild in Australia before European settlement and it is either a serious threat to primary production, Crown Land, the environment or community health in a place outside Victoria or its potential to threaten primary production, Crown Land, the environment or community health in Victoria is unknown. | Importation, keeping, breeding and trading is illegal and penalties apply. |
| | 'Controlled' pest animals may be declared by the Minister if it did not occur naturally in the wild before European settlement and it is, or has the potential to become a serious threat to primary production, Crown land, the environment or community health in Victoria and it should only be kept in high security collections or at premises approved by the Minister. | |
| | 'Regulated' pest animals may be declared by the Minister if it did not occur naturally in the wild before European settlement and it is, or has the potential to become a serious threat to primary production, Crown land, the environment or community health in Victoria and it should only be kept in collections or at premises approved by the Minister. | |
| 'Established' pest animals | 'Established' pest animals may be declared by the Minister if the species is established in the wild in Victoria and are a serious threat to primary production, Crown land, the environment and community health in Victoria. | Land owners have the responsibility to take all reasonable steps to prevent the spread of, and as far as possible eradicate, established pest animals on their land. |

Table 3. Pest categories and requirements in the CaLP Act 1994

Foxes and rabbits are declared 'established pest animals' under the Act. Land owners have the responsibility to take all reasonable steps to prevent the spread of, and as far as possible eradicate, established pest animals on their land.

Cats can be grouped into three categories according to how and where they live. The legal implications vary depending on the category. For the purpose of this strategy the following categories are used:

- **Feral cats** are unowned and live completely independently of humans with respect to food and shelter and without veterinary care. Feral cats survive and reproduce in self-perpetuating populations in the wild. By law, feral cats are (feral) pest animals if they are present on designated Crown land. Pest animal control must be carried out in accordance with the requirements of the Prevention of Cruelty to Animals Act 1986 (POCTA).
- **Stray or semi-owned cats**, partly rely on humans for food and shelter (whether it is provided intentionally or not). These cats are not a declared pest but will be considered for management within this strategy.

- **Domestic cats** are owned, and their care and needs are met by their owner. These cats are not declared a pest. However, they will be considered within this strategy for management through means such as Cat Curfews and education programs that aim to protect native flora and fauna from domestic cats.

It is important to note that these categories of cats are artificial and reflect a continuum, and individuals may move from one category to another (Newsome 1991; Moodie 1995).

Deer are recognised as pest animals by land managers, however, they are currently subject to complex regulations. Deer are 'protected wildlife' under the Wildlife Act 1975 and may not be destroyed without authorisation except where they are unprotected under the Act or listed under the CaLP Act. Sambar, Fallow, Rusa, Red (including Wapiti), Sika and Sika Deer - Red Deer hybrids, have been declared 'unprotected' wildlife on private land by way of a Governor in Council Order under section 7A of the Act for a period of 10 years (GMA, 2014).

Six species of deer (Chital, Fallow, Hog, Red, Rusa and Sambar) are also defined as game, which means they can be hunted by licensed game hunters subject to regulations under the Wildlife (Game) Regulations 2012. Under the Wildlife (Game) Regulations 2012 (S.R. No. 99/2012) Schedule 6, all Crown land in the municipal districts of Cardinia Shire Council and Yarra Ranges Shire Council are recognised deer habitat. In addition, some areas of Nillumbik are declared for hunting. Hunters acting in accordance with the Governor in Council Order are still subject to Wildlife (Game) Regulations 2012 when hunting on or traversing land listed in Schedule 6. In all other municipalities, hunting is not permitted and in many areas, deer shooting can only be undertaken by a Professional with a Public Place Permit.

Common (Indian) Myna are not listed as a pest bird under the CaLP Act and there are no legislative requirements to control them. Permission is not required to trap or dispose of Common (Indian) Myna, however obligations for animal welfare apply under the POCTA Act and POCTA Regulations 2019.

Common (Indian) Myna





Figure 2. Eastern Region Pest Animal Strategy Legislative Context

2.2 Policy Framework

This Strategy has been developed to be consistent with the Victorian Invasive Plant and Animal Policy Framework 2009. The risk-based approach in this Strategy is adapted from the Victorian Framework. In addition, this Strategy is further informed by the Australian Pest Animal Strategy, Melbourne Water Pest Animal Strategy, Port Phillip and Western Port Regional Catchment Strategy and local pest management plans (e.g. Nillumbik Council Invasive Species Action Plan).

The Victorian Invasive Plant and Animal Policy Framework prioritises early intervention in pest management and promotes targeted response programs tailored to the stage of invasion. The Invasion Curve plots return on investment from control actions. Management categories correspond with each stage of pest animal invasion (Figure 3). This illustrates that pest animal invasion is most cost effective in the early stages of invasion when the area occupied is low and the costs to control are low relative to costs associated with a widespread infestation.

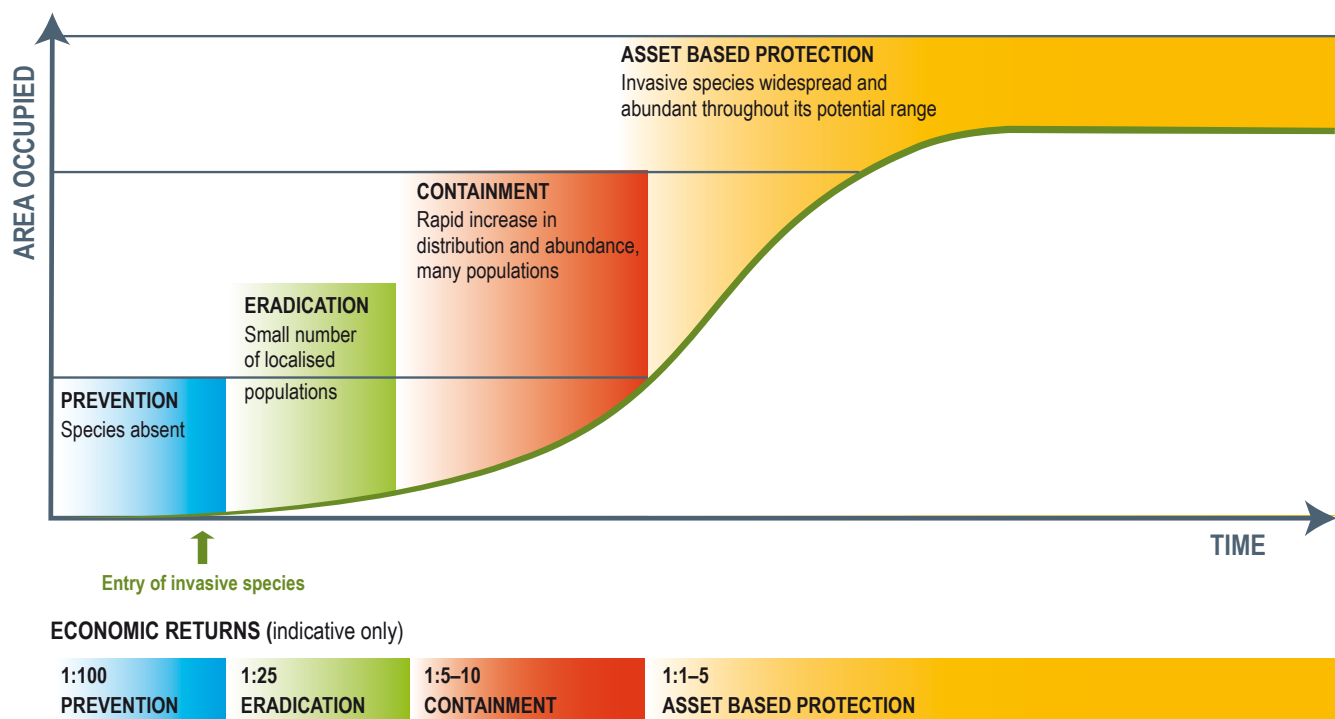


Figure 3. The 'Invasion Curve' Source: Victorian Invasive Plant and Animal Policy Framework (Agriculture Victoria)

Regional goals have been developed for each management category (Table 4).

Prevention/Alert

Goal

Prevent pest animal species arriving and establishing in the Region causing adverse impacts on biodiversity, primary industry and social well-being.

Responsibility

To understand and report any sightings of 'restricted' pest animal species identified under the CaLP Act.

Eradication

Goal

To permanently remove the species from the Region or defined locality and to develop actions to prevent its re-establishment

Responsibility

To participate in coordinated programs and stay up to date with current information on pest animals in the region.

Containment

Goal

Prevent the spread of a pest animal beyond the boundary of its current extent to other parts of the Region.

Responsibility

To participate in coordinated programs, stay up to date 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 or social value.

Responsibility

To participate in coordinated programs, stay up to date and apply best practice pest animal management practices. Ensure practices are coordinated with the wider community.

Table 4. Pest animal management categories for the Eastern Region

2.3 Roles and Responsibilities

Pest animal management is a shared responsibility across Government, landholders, producers and custodians. Effective pest animal management requires tenure blind, cross collaboration.

Australian Government

Oversee chemical regulation of Pesticides and Veterinary Medicines.

Provide oversight and coordination for emergency responses to pest animal incursions of national significance.

Provide a legislative framework, including biosecurity and environmental legislation, to minimise the risk pre-border and at the border of pest animal incursions including undertaking enforcement actions and regulatory interventions when necessary.

Manage pest animals on Australian Government land in a responsible way, in co-operation with other landowners.

Facilitate coordinated policy across jurisdictions for the management of established pest animals of 'national significance.'

Provide support where there is sustained collective national action to manage an established pest animal by an industry or community.

Support national research and development of improved pest animal control or management when there is a strong public interest to do so, and through matching industry contributions to rural research and development.

Work with state and territory governments to provide mechanisms by which pest animal issues of national significance can be identified and addressed.

Coordinate, facilitate and promote national pest animal management policies and programs.

Provide leadership, coordination and resources for evaluation and education to build public awareness and knowledge of pest animal issues of national significance.

Encourage and support the development and integration of effective pest animal management strategies at all levels of land management.

Promote the development of ongoing partnerships between governments, industry, community and scientists

Support the collection and collation of national pest animal data and information.

Department of Jobs, Precincts and Regions – Victoria

State-wide lead for policy development and implementation for invasive plants and animals.

State-wide lead for policy development and implementation for animal welfare.

Enforcing provisions of the *CaLP Act* aligned to state-wide and regional invasive plant and animal management priorities (e.g. compliance programs for the management of invasive species on private land).

Identification and risk assessment of new high-risk invasive plants and animals.

Contributing data for Strategy monitoring, evaluation and reporting.

Prevention and preparedness to manage new incursions of high-risk invasive plants and animals.

Surveillance programs for early detection of high-risk invasive plants and animals.

Respond to high risk invasive plants and animals into Victoria (new high-risk invasive animal species treated for eradication on private and public land).

Provision of technical and best practice advice on the prevention and management of invasive species declared under the *CaLP Act*.

Department of Environment, Land, Water and Planning – Victoria

Enforcement of the Wildlife Act 1975

Participate as a member of the Eastern Region Pest Animal Network.

Management of Crown land reserves and State forests.

Lead role in delivery of pest animal control programs on public land and completing associated monitoring and reporting.

Facilitate pest control to enhance the survival of isolated populations of threatened species.

Oversight of policy implementation regarding pest animal control to protect biodiversity on public land.

Implementation of regulations, ministerial guidelines, templates and procedures under the *Flora and fauna Guarantee (FFG) Act 1988*.

Development and support of decision support tools including the Strategic Management Prospects Tool.

Parks Victoria

Participate as a member of the Eastern Region Pest Animal Network.

Management of National parks, State parks and conservation reserves.

Delivery of pest animal control programs in parks and reserves.

Contributing data to pest animal monitoring, evaluation and reporting.

Port Phillip and Westernport CMA

Participate as a member of the Eastern Region Pest Animal Network.

Strategic planning and coordination for natural resource management in the region.

Reporting on the condition of the region's natural resources.

Community awareness raising/education on natural resources management issues.

Provision of advice to the Minister on recommendations for the declaration or revocation of invasive species under the *CaLP Act*.

Preparation of the Port Phillip and Western Port Regional Catchment Strategy

Melbourne Water

Participate as a member of the Eastern Region Pest Animal Network.

Contribute data for Strategy monitoring, evaluation and reporting.

Management of Melbourne's water supply catchments and dams, manages rivers, creeks and major drainage systems in and around Melbourne.

Management of water infrastructure including water treatment plants and pipelines.

Same land management responsibilities as other land owners and managers under the *CaLP Act*.

Local Government

Participate as a member of the Eastern Region Pest Animal Network.

Same land management responsibilities as other land owners and managers under the *CaLP Act*. This is sometimes supplemented with a Parks Victoria 'good neighbour' policy.

Implement the *Planning and Environment Act 1987*, develop and implement local planning schemes

Must have regard to promote social, economic and environmental viability and sustainability of the municipal district under the *Local Government Act 1989* (Section 3, part C.2a).

Have the power to make Orders under Part 10C of the *LG Act*.

VicRoads

Participate as a member of the Eastern Region Pest Animal Network.

Maintain highways and declared main roads including all aspects of managing the road reserve, including invasive species

management. As land owners, they have the same duty of care responsibilities as other land owners/managers under the *CaLP Act*.

Contributing data for Strategy monitoring, evaluation and reporting.

Other Landholders

Landholder responsibilities (both private and public) are to address their obligations under the *CaLP Act* and any local laws with respect to declared pest animals. Public land managers also have obligations under other Acts that must be met by undertaking further pest animal management. Landholders are also responsible for:

Detect and report new pest animal occurrences

Control and manage established pest animals to mitigate, as necessary, the impacts on their own assets, or as required by regulation

Take reasonable steps to minimise the impacts of established pest animals to other landholders and the broader environment, particularly through participation in programs of collective industry or community-led action eg Landcare

Cooperate with and plan pest animal management activities jointly with neighbours, as well as state, territory and local governments, within a landscape scale/cross-tenure approach

Apply knowledge and skills to improve pest animal management and understand the need to use multiple approaches (e.g. chemical, physical and biological), as part of an integrated pest control approach, to prevent pest animals from adapting to existing controls.

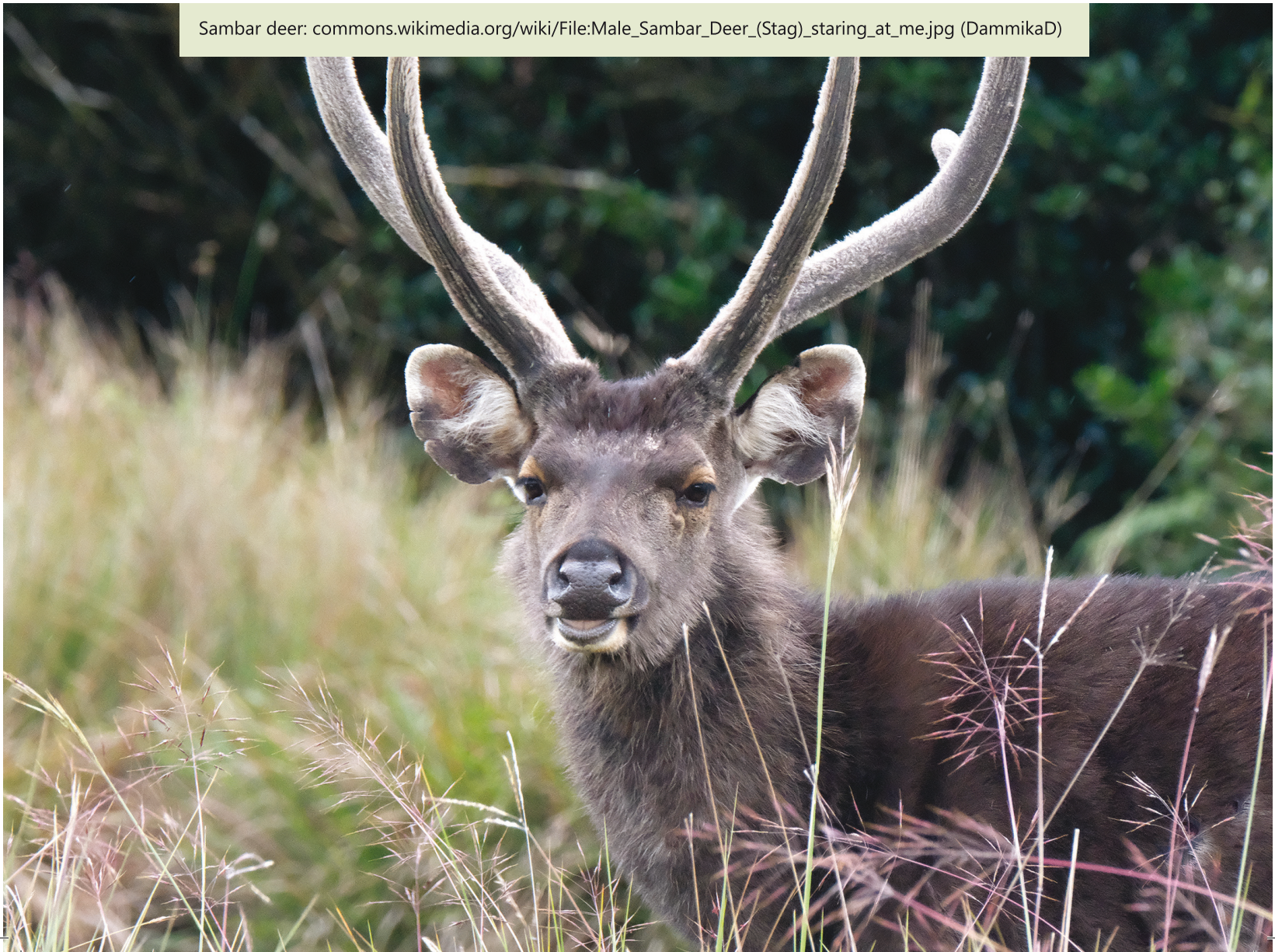
2.4 Regional Collaboration

Regional stakeholders have demonstrated a desire to collaborate on this important environmental issue. Benefits of this approach include cost-effective delivery and accountability and increased knowledge sharing leading to capacity building and strategic landscape-scale outcomes. It may also promote economies of scale that enables Network members to take on more complex projects whilst maintaining base service delivery. The regional collaboration model overcomes obstructions from competitive grant programs if parties agree to and adhere to a regional strategic plan. There are also profound benefits for promoting issues throughout the broader community, whilst dividing or sharing pressure from negative responses. Perhaps most importantly, fostering dynamic relationships benefits all stakeholders.

In practical terms, becoming a regional player means accepting that issues don't conform to public land boundaries and shared resources may be apportioned to greatest benefit rather than on equity basis. This requires trust amongst stakeholders and a commitment to communication.

Important characteristics for successful collaboration are organisational culture, leadership, flexibility, existing relationships and strong change management processes to overcome internal obstacles (Pearson L, Houghton K 2018, Sansom G, James J, Artist S 2015, Somerville Gibbs 2012).

Sambar deer: [commons.wikimedia.org/wiki/File:Male_Sambar_Deer_\(Stag\)_staring_at_me.jpg](https://commons.wikimedia.org/wiki/File:Male_Sambar_Deer_(Stag)_staring_at_me.jpg) (DammikaD)





3

Defining the Problem

3.1 Impacts of Pest Animals

Pest animal management is a complex issue for all land managers and there are a wide range of impacts from established and emerging pest species in the region.

The threat or risk from pest animals may be portrayed through different paradigms.

- In managing the region's natural assets, pest animals are a key risk to biodiversity and threatened species.
- In managing the region's social and economic values, pest animals may pose a safety hazard to the community and impact the region's agricultural productivity.

Pest animals impact public safety directly and indirectly. Deer strike is reported to be increasing in parts of the region, posing a safety concern on roads. Red Deer, male stags are known to attack humans or pets with their antlers if they are trapped and feel threatened. A Sambar Deer has already knocked over two school students at a Maroondah school and deer have been seen in kindergarten playgrounds in Maroondah. Deer are also known to be carriers of the *Cryptosporidium* parasite which may result in contamination of local water supplies such as Upper Yarra and Sugarloaf, costing millions to treat for human consumption.

Primary industry and agriculture may be impacted directly through predation, competition, disease and disruption leading to loss of productivity, resource strain (on farmers) and safety concerns. Foxes prey on livestock (mainly lambs and poultry) while rabbits and deer compete with livestock for pasture and damage soil cover and composition (Gong et al. 2009, Coutts-Smith 2007, McLeod 2004, Reddiex & Forsyth 2004). Deer are also a potential vector for disease spread to stock.

Pest animals are a significant threat to biodiversity through competition, predation, habitat destruction and as a vector for the spread of diseases. Small native mammals, ground-nesting birds and reptiles are all susceptible to predation by foxes and cats, and these pests are associated with the extinction of several native fauna species (Doherty et al. 2017, Woinarski et al. 2015, Garrock et al. 2014; Invasive Animals CISS 2014; Reddiex & Forsyth 2004). Cats are carriers of infectious diseases (e.g. *sarcosporidiosis* bacteria) which can be fatal to native animals and stock.

In the region, foxes prey on iconic species including Slender-tailed Dunnart (*Sminthopsis murina*), Brush-tailed Phascogale (*Phascogale tapoatafa*), Spotted Quail-thrush (*Cinclosoma punctatum*), Brown Quail (*Coturnix ypsilophora*), Superb Lyrebird (*Menura novaehollandiae*) and Southern brown Bandicoot (*Isodon obesulus obesulus*). Common (Indian) Mynas aggressively compete with native birds resulting in their local decline from areas.

Image: David Croft/Department of Planning, Industry and Environment





European rabbit: commons.wikimedia.org/wiki/File:Oryctolagus_cuniculus_Helsinki.jpg

Rabbits and deer have a significant impact on native habitat, altering the composition and structure of native vegetation through browsing, preventing the regeneration of native plants, spreading weeds, causing soil erosion and degrading water quality (Davis et al. 2016). They may compete with native herbivores for food, and further degrade the environment by providing an abundant food source for other pests. For example, rabbits can support high densities of feral cats and foxes, which in turn suppress native prey.

Pest animal threats are likely to be compounded by climate change in three main ways. First, new temperature and rainfall patterns may facilitate the establishment of new invaders and increase the impacts of existing pests (Steffen et al. 2009). Second, an increase in extreme weather events, such as fire, could increase predation by cats and foxes on declining species, by removing protective vegetation cover (Gill et al. 1999). Finally, the stress imposed by climate change is likely to increase the susceptibility of species to invasive animals and increase the vulnerability of ecosystems. For example, the grazing pressure of rabbits reduces the resilience of native plants to drought (Low 2008).

Factors that currently influence pest animal management within the Eastern region include restricted resources available for pest management, myriad of public and private land managers, changes in land use (i.e. increasing urbanisation), absentee land managers, small hobby farms, urban areas and, public places with limited control options. Management of wild deer and feral cats is limited by a lack of control methods currently available for these species. The Eastern Region borders the Goulburn Broken and West Gippsland CMA's, as well as the City of Melbourne. There are limited inter-regional or statewide co-operative programs in place for pest species with most regions undertaking their own pest control programs.

3.2 Key Assets

In assessing the current pest issues faced by local councils and public land managers (e.g. VicRoads, Parks Victoria and Melbourne Water), four key assets: biodiversity, waterways, primary industry (agriculture) and social wellbeing were identified as requiring protection. Key regional assets and pest animal impacts are described in Table 5. This summary illustrates the extent of harmful impacts from pest animals in the Eastern Region and the multi stakeholder collaboration required to manage pest levels.

This Strategy is focused on site-based outcomes. Figure 4 shows key regional natural assets that are valued for conservation and recreation purposes. This baseline map has been derived from multiple, existing sources including local strategic plans, VEAC Open Space, private land conservation covenants, Biosites, Ramsar wetlands locations, waterways, rail corridors and nature reserves. This presents a baseline map that may be updated by the Network.

Assets may be significant to local, regional, state or national stakeholders. As a regional Strategy, the action plan is primarily focused on assets that serve multiple stakeholders and purposes. Implementation of tenure blind, cross border collaborations will be prioritized to minimise 'source and sink' population recovery of target pests.

At a local scale, each LGA has nature reserves of conservation significance and of community significance such as Yarra Bend, Bend of Islands, Warrandyte State Park, Darebin Parklands, Bunyip State Park, Western Port Bay Ramsar wetland and, Yellingbo Nature Conservation Area. Many of these also form part of sub regional assets such as Sugarloaf link (between Kinglake and the Yarra River).

In addition, DELWP has developed a series of strategic management prospects maps to support maximum biodiversity gains from NRM investments. Spatial data has been provided to the Network to inform planning and is also available via an online NatureKit Map Viewer.

Image: David Croft/Department of Planning, Industry and Environment








Figure 4: Eastern Region Natural Assets

| Assets | Eastern Region Pest Impacts | Eastern Region Evidence Base |
|---|--|--|
| Biodiversity | | |
| Threatened species  | Predation and competition with threatened species including: <ul style="list-style-type: none"> • Helmeted Honeyeater • Powerful Owl • Leadbeater's Possum • Brush-tailed Phascogale • Swamp Antechinus • Southern Brown Bandicoot • Southern Toadlet • Grey-headed flying fox • Growling Grass Frog • Spot-tailed Quoll • Migratory shorebirds | Parks Victoria monitoring program. Research scientists, anecdotal observations. |
| Native birds  | Primarily predation on native birds by foxes and cats (e.g. water birds, fledgling chicks, migratory and non-migratory shorebirds). Competition with threatened and non-threatened woodland birds (e.g. Common (Indian) Myna territorial behaviours and nest cavity exclusion). | Anecdotal observations. Parks Victoria monitoring program. Gaps in scientific research at the local scale that quantifies or confirms Common (Indian) Myna and feral cat impacts. |
| Small reptiles and mammals  | Primarily predation on: <ul style="list-style-type: none"> • Mammals in the critical weight range (0.45 – 5 kg) and competition with native predators. • Predation of nesting turtles | Anecdotal observations. individual council monitoring programs. |
| Native vegetation, including threatened ecological communities  | Grazing impacts to native vegetation, through browsing, erosion, and prevention of regeneration. Deer defoliate, strip bark and break stems, leading to reductions in plant biomass in the shrub layer, impeded vertical growth and altered community composition. Reduce vegetation cover, tree regeneration, sapling growth and plant species diversity. Damage to revegetation areas. | Deer enclosure and exclusion studies (see Davis et al. 2016 for a summary of studies in Victoria). Melbourne Water Deer Catchment Study (GHD 2019) – four years of ecological monitoring. |

Table 5. Key assets and pest impact in the Eastern Region

| Assets | Eastern Region Pest Impacts | Eastern Region Evidence Base |
|---|--|---|
| Waterways  | <p>Waterway quality in catchments (deer) through erosion, soil compaction and turbidity and alteration of vegetation composition and structure.</p> <p>Rabbit burrows in dam walls.</p> | <p>Melbourne Water Deer Catchment Study (GHD 2019) – four years of ecological monitoring.</p> |
| Agriculture  | <p>Browsing impacts to agricultural values including orchards, pasture, vineyards and timber plantations.</p> <p>Predation on livestock (i.e. poultry and lambs).</p> <p>Eating trees, damaging fences, eating pasture, fruit and vegetable crops, trampling crops and fouling of pasture crops or water.</p> <p>Foxes, deer, cats as a vector for noxious weeds and disease (e.g. mange, Leptospirosis).</p> | <p>Anecdotal. Council on-ground staff observations and conversations with landholders / telephone calls from residents to council.</p> |
| Social wellbeing  | <p>Public safety, car accidents from vehicle collisions, particularly deer.</p> <p>Damage to recreational reserves (e.g. sports grounds, open space areas) from grazing, burrowing.</p> <p>Potential contamination to water supply by parasite</p> <p>Distress from viewing pest species in backyards and on farms. E.g. Noise complaints and health and safety concerns from Common (Indian) Mynas.</p> <p>Conflict between Council and community with differing attitudes on pest animal management. e.g. baiting in bushland reserves where dogs can access.</p> <p>Stress for farm businesses due to the financial consequences of pest animals.</p> <p>Damage to infrastructure including roads, buildings, fencing, pathways and water infrastructure.</p> <p>Decreased aesthetic value of areas and public nuisance. E.g. Common (Indian) Myna dominated urban streetscapes less aesthetically appealing.</p> | <p>VicRoads vehicle collision strike data.</p> <p>Anecdotal. Council on-ground staff observations and conversations with landholders / telephone calls from residents to council.</p> |

3.3 Current Distribution of Pest Animals

Available, existing data has been collated for each priority pest animal. This provides a regional snapshot of the current threat of each pest animal (Figure 5 - Figure 9).

Multiple data sources have been used to identify current hotspots using cluster analysis and GIS tools. Point records from FeralScan and other registers form a valuable base. However, it is recognised that this data contains geographic bias and does not reflect absence of threat. Expert elicitation was used to rank extent and abundance for each pest species on a scale from *low* to *very high* or 'unknown' for each sub catchment and LGA. This information is included in Figure 5 - Figure 9 and provides regionwide coverage of relative severity and current information gaps.

The spatial data collated is subject to data license agreements (held by the Network) in accordance with data privacy requirements. Hotspot analysis may be used to inform operational planning and may be subject to updates.



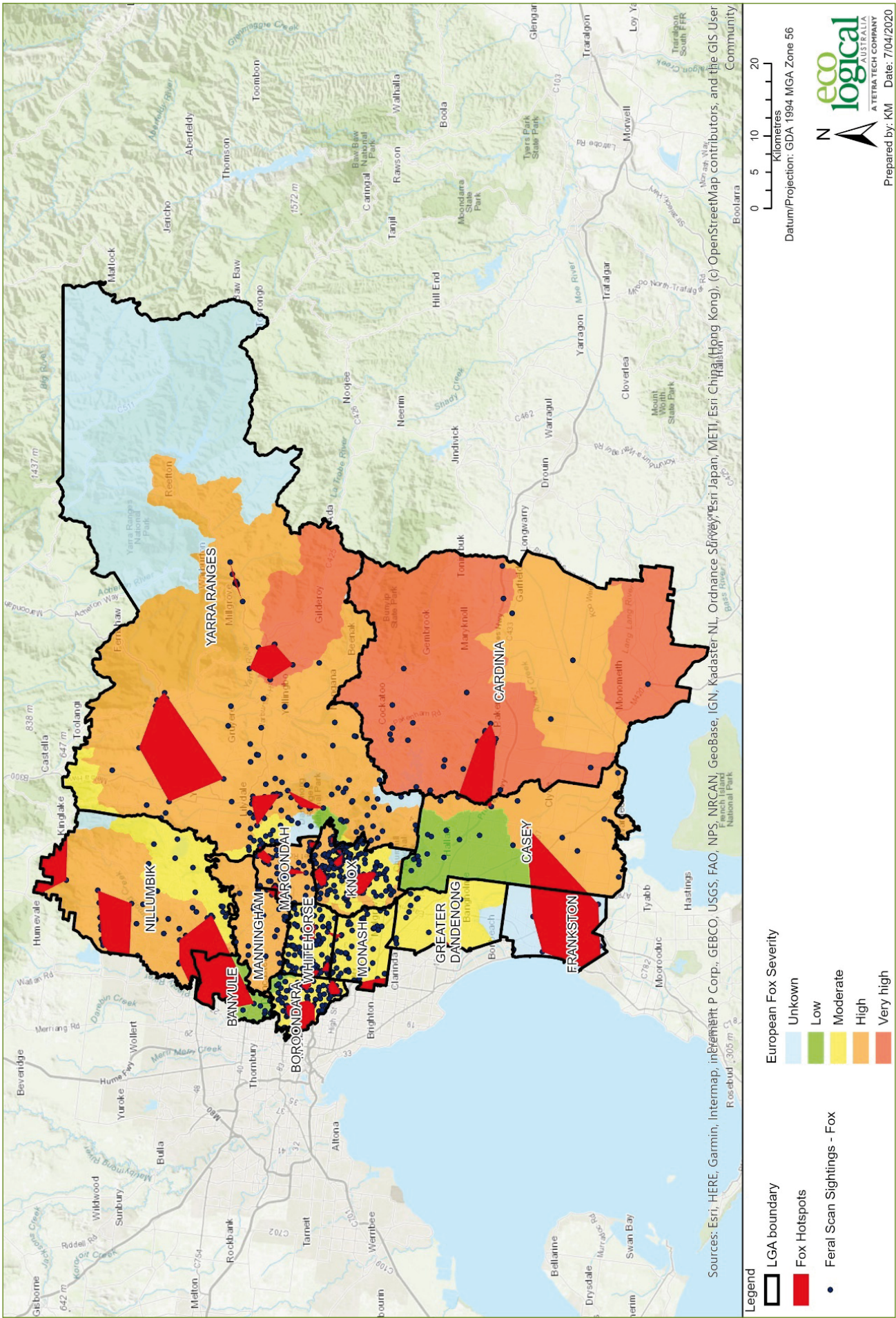


Figure 5. European Fox Threat

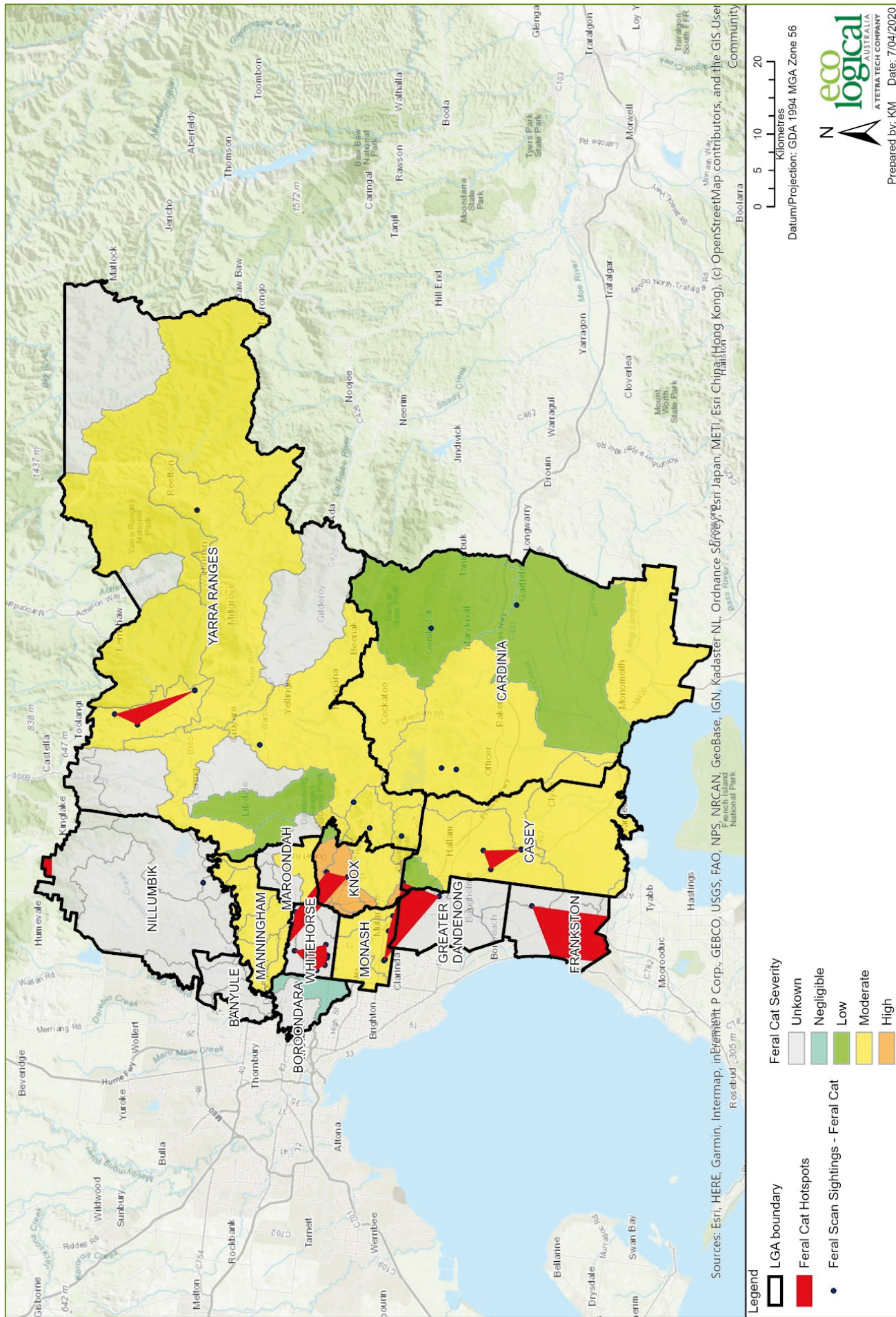


Figure 6. Feral Cat Threat

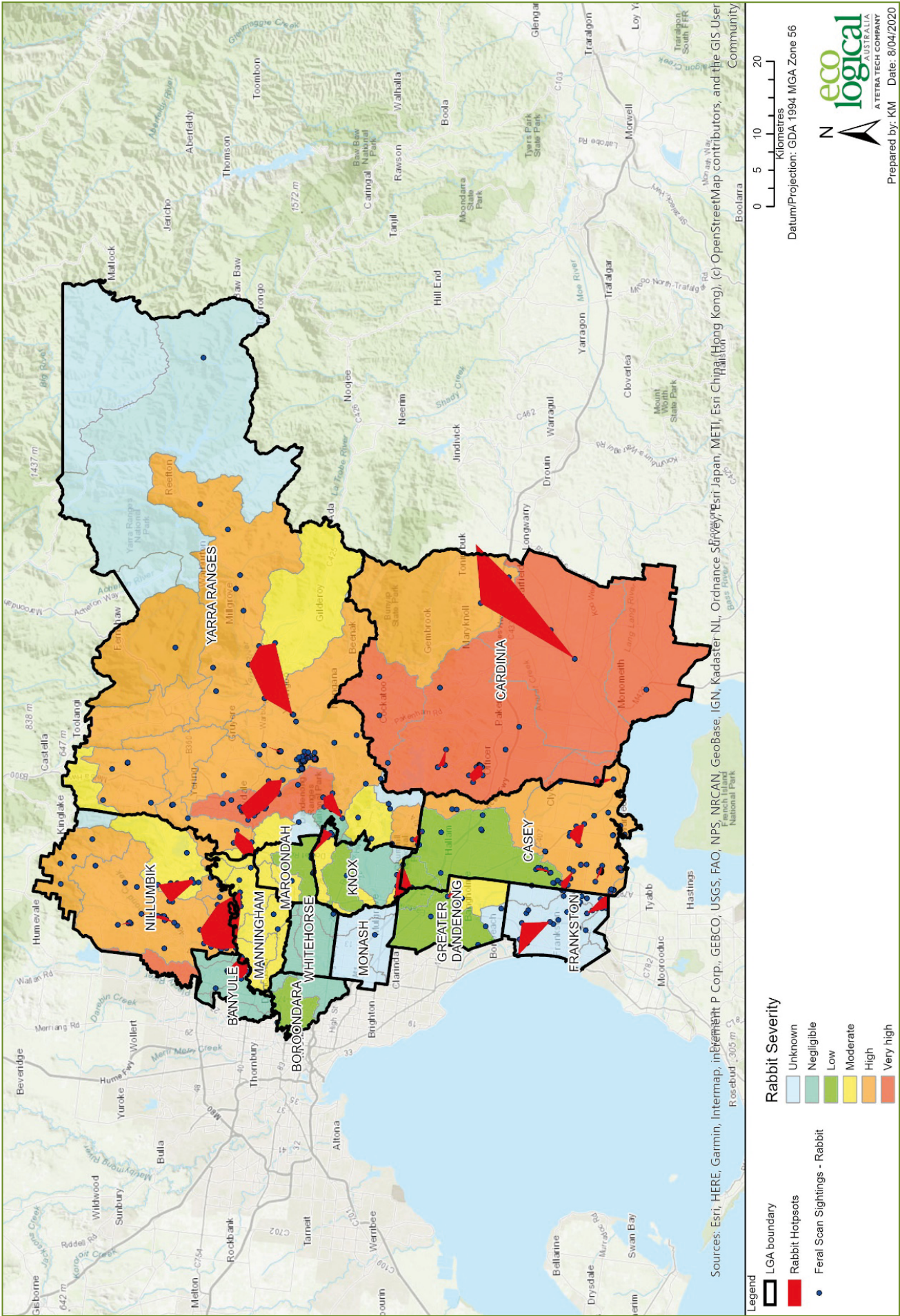


Figure 7. European Rabbit Threat

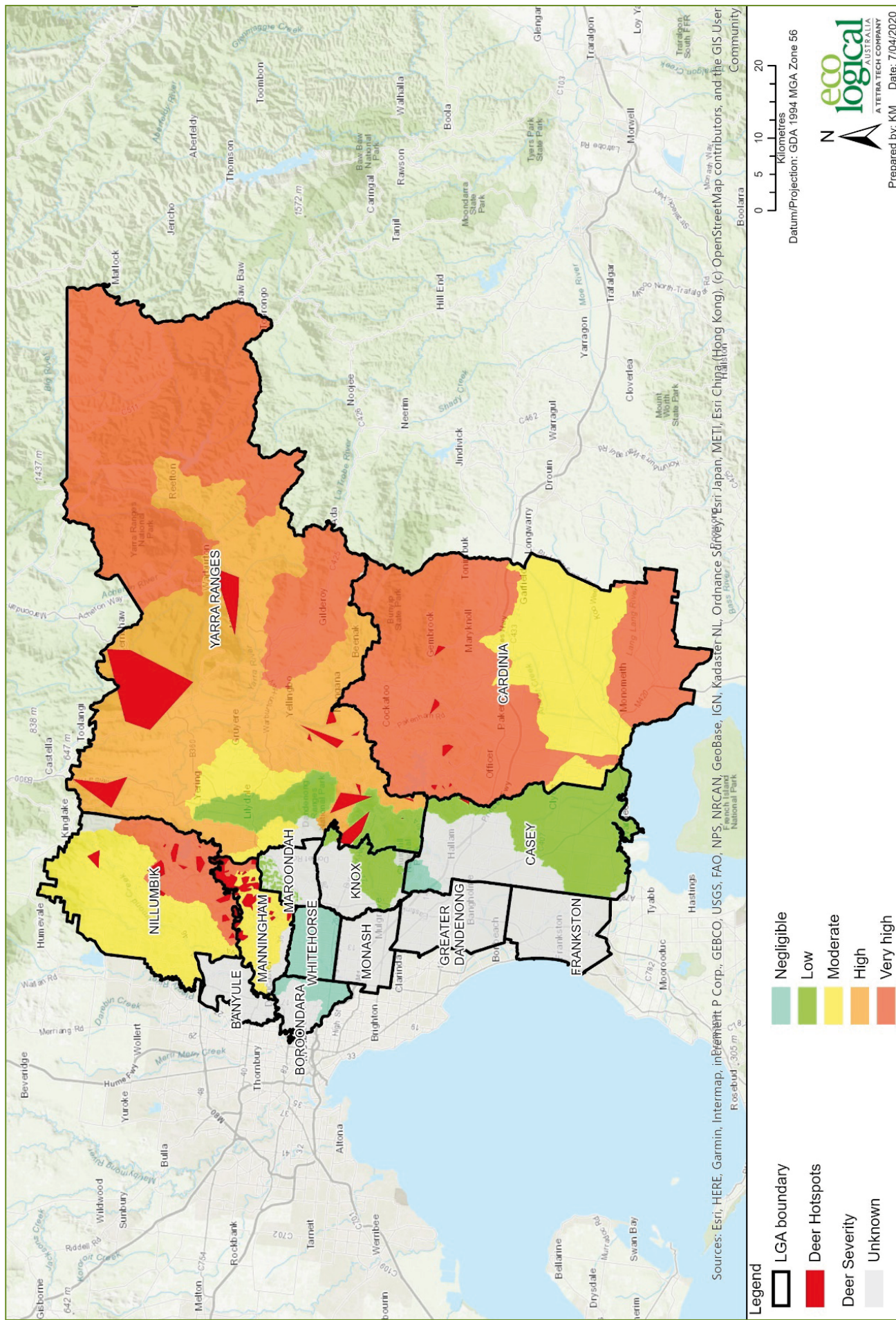


Figure 8. Deer Threat

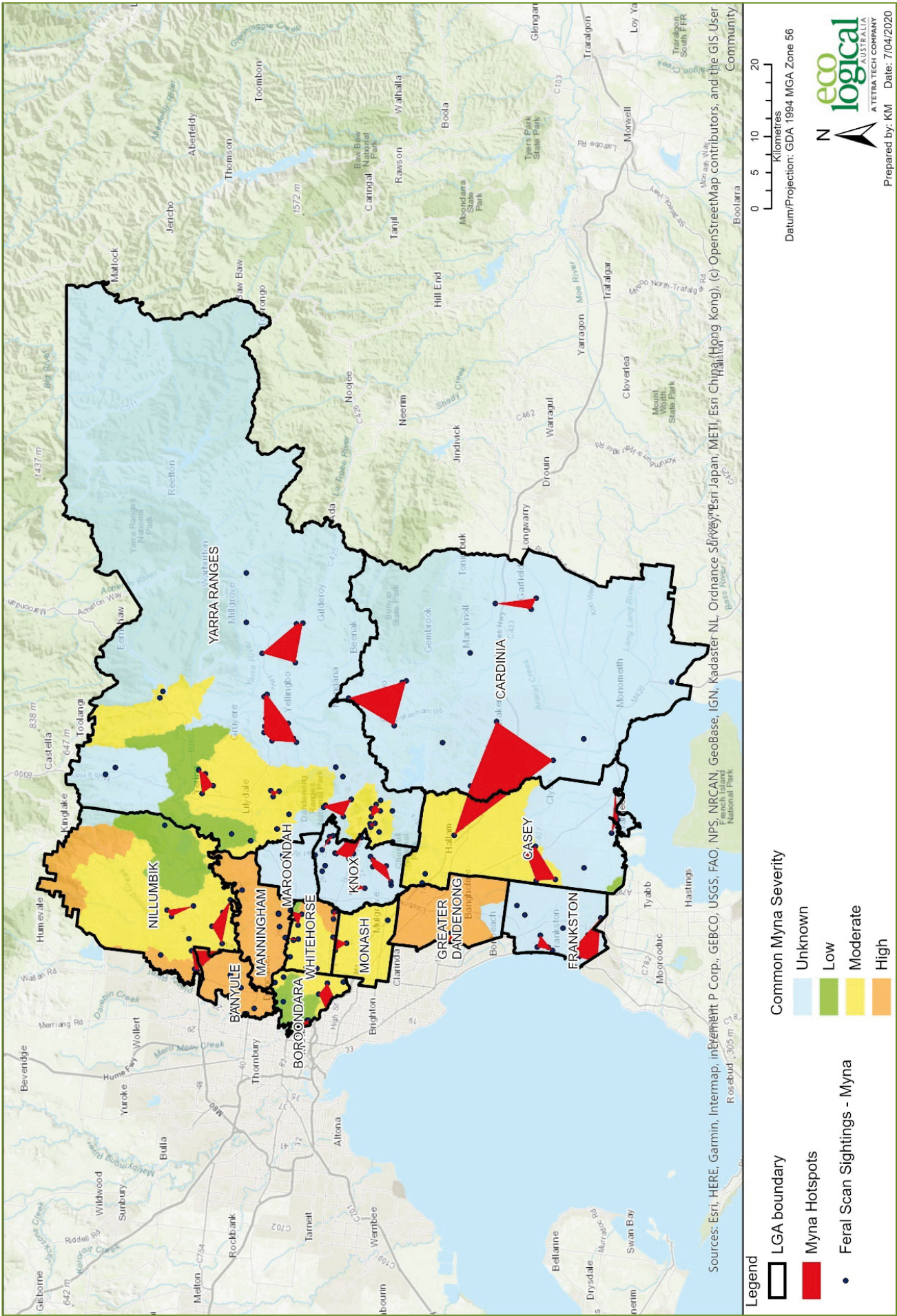


Figure 9. Common (Indian) Myna Threat

3.4 Current Pest Management Programs

Interviews with Network members and a review of publicly available pest management programs provides a snapshot of pest management effort in the region. Management actions to date across the Eastern Region have included:

- Common (Indian) Myna trapping and cage loan to residents;
- Deer shooting by professionals and permit holding volunteers in restricted locations;
- Rabbit baiting, trapping, ferreting, calicivirus release, warren destruction, harbor removal, shooting and fence exclusion zones;
- Fox soft-jaw trapping, baiting, and den destruction;
- Cat curfews.

These actions have been taken by individual organisations or sub regional partnerships. Network respondents identified the value in coordinated roll out of these actions across the region, incorporating current momentum and project learnings. A full list of Network member control actions is provided in *Volume 2*.

3.4.1 Barriers to management

Based on stakeholder opinions across the Eastern Region, barriers to management include:

- The inability to adapt pest control to specific landscapes (including risk of control methods to people and pets).
- Lack of understanding of the corridors and dispersal of pests across the landscape.
- Maintaining consistent control efforts in the long-term and accounting for re-invasion once control methods are relaxed.
- A lack of a coordinated approach across all land tenures.
- Community perception.
- Impact of control methods on domestic animals and animal ethics/welfare.
- Legal roadblocks (for example deer are protected under the *Wildlife Act 1975*).
- Resources and funding.
- Inconsistent monitoring methodology for all species.
- Lack of individual government body responsible for deer management.

4

Pest Control in Practice

4.1 Integrated Pest Control

Effective pest control is contingent on applying integrated control at the landscape scale. The Network recognises that small, uncoordinated approaches to pest management are insufficient to deal with the escalating pest animal problem.

Feral cat control, for example, is most effective when a strategic, targeted and well planned program is delivered using all available control tools. Integrating control of multiple pest species is recognised as current best practice to limit unintended impacts. As one target species is controlled then other feral species may simply “fill in” the created trophic gap as they exploit the reduced competition. Targeting multiple pest species at the same time will provide substantial cost savings compared with a series of single eradications (Griffiths, 2011).

An integrated pest control approach has capacity to minimise the potential for unintended trophic cascades. For example, targeting foxes without also implementing control of feral cats has the potential to lead to an increase in cat numbers, as they are released from predation by foxes (Algar & Smith, 1998). Doherty & Ritchie (2017) note that fox control must incorporate not just cat control, but also rabbit control to prevent population spikes as fox predation declines. Equally, controlling feral grazing animals without also controlling feral predators could lead to prey switching by feral predators to native animals (Cupples et al., 2011). In addition, programs designed for site outcomes may need complimentary rehabilitation plantings following integrated control implementation.

4.2 Pest Control Techniques

Pest control should be targeted to specific sites to address specified impacts, using suitable control methods and complimentary actions to enhance ecosystem resilience in accordance with long term, site specific goals. This holistic approach will avoid unintended deleterious impacts such as weed incursions post grazing pressure removal or increased fire risk from unmanaged fuel load build ups. Table 6 provides a summary of control strategies suitable in urban, peri-urban and rural environments. Standard Operating Procedures (SOPs) for the control of each target pest species are provided in Volume 2. The SOPs detail practical step-by-step 'on-ground' actions which can be completed by council officers, contractors or community groups to control target pest animal species.

Image: David Croft/Department of Planning, Industry and Environment



A summary of key control strategies and options for target species

| | European Fox | Feral Cat | European Rabbit | Feral Deer | Common (Indian) Myna |
|--|--|--|---|---|--|
| Home Range | 1 Individual (arid zone) is 20km ² 6-7 individuals (resource rich areas) every 3-5km ² . | Mostly solitary animals and usually maintain a home range which may be up to 10 km ² for males and less for females ² | Varies from approximately 0.2-2 ha depending on rabbit density, food availability, sex, age and surface cover ³ | Unknown | Non-migratory, however capable of frequently extending range into new territories across eastern Australia (FeralScan 2009). |
| Active time | Nocturnal | Nocturnal and Diurnal | Nocturnal | Early morning & evening | Diurnal - move to roost sites on dusk |
| Rural and peri-urban (incl. bushland reserves) control Techniques | Bait with highly palatable fresh meat to enhance uptake. 5-10 baits per km ² . Warren destruction. Trapping. Shooting. Exclusion fencing for high value biodiversity sites. | Bait on Crown Land. Cat curfew. Shooting (Crown land, subject to approval). Cage trapping, Leg hold trapping (approval required) | Poison with 1080. Warren destruction. Shooting. Ferretting. Warren jamming. Harbour destruction. Exclusion fencing for high value biodiversity sites. | Shooting. Exclusion fencing for high value biodiversity sites. | Trapping and euthanasia. |

² <http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/pest-animals/a-z-of-pest-animals/cat-feral-or-wild>

³ <http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/pest-animals/a-z-of-pest-animals/european-rabbit/about-european-rabbit>

| | European Fox | Feral Cat | European Rabbit | Feral Deer | Common (Indian) Myna |
|---|---|---|---|---|--|
| Urban control techniques | Warren destruction. Guard animals. | Cat curfew. Dense native vegetation plantings (e.g. shrubs, sedges, clumping grass). Cage trapping. | Warren destruction Ferretting. Harbour destruction. | Shooting (if possible) Deer exclusion fencing. | Trapping and euthanasia. Dense native vegetation plantings (e.g. shrubs, sedges, clumping grass). Remove food sources (e.g. open bins, uneaten pet food). Block holes/areas where they might nest. Install netting or bird spikes to prevent roosting. |
| Emerging control techniques | Felixer (Thylation 2019). sensors to distinguish target cats and foxes from non-target wildlife and humans etc and spray targets with a measured dose of toxic gel. Gene-editing solutions, known as 'CRISPRcas9' | Felixer (Thylation 2019). Rangefinder sensors to distinguish target cats and foxes from non-target wildlife and humans etc and spray targets with a measured dose of toxic gel. Curiosity bait is currently being developed for permit use by public land managers in Victoria. | New myxomatosis strain RHVD1 (K5 Strain) (Pestsmart 2019) | - Trial of poisoning via selective feed structure (NSW) - Trial of repellents (Lake Mountain, Vic) | - |
| Timing for Primary Control Technique | Quarterly | Annually: 2 x per year in Autumn & early Winter when live prey availability is low | Annually, late summer – winter | Location dependent | Post and during breeding season. Breeding season in Southern Australia – October – March. (FeralScan 2009) |

Table 6. A summary of key control strategies and options for target species

| | European Fox | Feral Cat | European Rabbit | Feral Deer | Common (Indian) Myna |
|--|--|--|--|--|---|
| Intensity of Primary control | Intensive and widespread | Intensive and wide spread. Postpone baiting if high rainfall precedes planned bait events, due to potential booms in live prey. | During drought or winter when population numbers are at their lowest so as to maximise efforts and minimise costs | Targeted intensive outside fawning or breeding season | Targeted to problem areas. In areas of recent range expansion control should be intensive and consistent to eradicate prior to establishment. Once yearly, targeted control efforts are recommended |
| Secondary and Follow up control | Shooting & Trapping Post control complimentary restoration planning | Trapping and Shooting Post control complimentary restoration planning | Warren ripping or fumigation if the use of warrens is confirmed. Dogs can be used to drive rabbits into warrens prior to control action. Post control complimentary restoration planning | Herding, trapping and euthanise. Carcass disposal (subject to permits) Fencing also known to be effective in some areas. Post control complimentary restoration planning | Same as primary, once yearly. Other preventative methods can include considered plantings and increased community awareness and individual action (traps for hire through local councils for members of public). Native mid storey augmentation (option) |
| Trophic considerations | Reduced fox numbers will lead to increased rabbit and cat numbers Can be controlled by apex predator presence | Reduced cat numbers will lead to increased rabbit and rat numbers Can be controlled by apex predator presence | Reduced rabbit numbers will lead to pre-switching by foxes and cats Can be controlled by apex predator presence | Removal will release grazing pressure; other browsing grazers could increase due to removal of deer. | Control efforts should reduce competition and exclusion for hollow dependent birds and arboreal mammals. |

4.3 Case Study Cardinia Deer Management Coalition

Description

The Cardinia Deer Management Coalition (CDMC) are an open group, comprised of local community members and allied environmental groups, with a common interest in reducing deer impacts in their local area, through humane and legal deer control. The coalition is a community-based facilitation network that was formed after locals observed escalating presence and damage from deer on private property, farms and local roads.

CDMC provides advice to landholders on how to engage in control activities. This includes providing information on site assessment tips, legal requirements, sourcing locally based and permit holding hunters, practical management tips supervising implementation and reporting deer control. The coalition invests a portion of its volunteer time in scientific research to grow knowledge of deer distribution and impact management.

The coalition also engages in advocacy for improved control efficiency and ethics of deer management. Its mission is to connect community to protect Cardinia Creek catchment and its biodiversity through humane deer reduction.



Initiation

The coalition was formed in 2018 following two open community meetings auspiced by the Upper Beaconsfield conservation group held in local community centres. A working group was created from a cross section of attendees who volunteered their skills, knowledge and time to formalise the group following considerable local interest. The working group was able share knowledge and guide engagement strategies. The coalition was incorporated in 2019 and maintains an official register of paid membership.

Why successful

CDMC has placed significant emphasis on open meetings so that all interested stakeholders may participate and has treated all initial correspondence as confidential to break-down barriers to participation. The coalition has sought to empower members to tackle common goals whilst accommodating and recognising the diversity of views amongst community members. It has been successful through agreed group communication protocols and respectful relationships.

As a grass roots group, the coalition is made up of local landholders and citizens with vested interest in local outcomes. A key factor in the success of the group has been establishing a clear mission and vision statement to maintain focus. This is helpful to navigate through conflict or challenges as they arise. The coalition has a mix of contributors and requires a minimum five active members to operate. The contributors bring good organisational skills in addition to leadership, communication skills and energy to make the coalition work. Since inception, this has generated increased participation, advocacy and property-based deer control. The coalition will measure it's success by the environmental response to removal of deer pressure. This is a long-term measure of success and requires a multifaceted, collaborative approach.

Application

The Eastern Region Pest Animal Network members could directly utilise CDMC to engage landholders in cross tenure, coordinated control activities. The CDMC may share knowledge and advise other communities similarly engaged in trying to reduce deer impacts. Through practical trial and error, the coalition has amassed experience in letting landholders know what is permissible and what the risks are to implement humane deer control. The match-maker model may be adopted in other localities and brokered through joint meetings. The Network can assist CDMC with local knowledge and contacts to expand activity areas. The Network may also support CDMC with in-kind and grant contributions.

4.4 Case Study Victorian Rabbit Action Network

Description

The Victorian Rabbit Action Network (VRAN) is a community-based facilitation network. VRAN supports communities, governments and organisations to work together towards effective rabbit management.

VRAN provides grants to community groups to run field demonstrations e.g. utilising the Rabbit Haemorrhagic Disease Virus (RHDV K5), undertake Rabbit Boot Camp training and participate in 'Leaps and Bounds' learning network. In addition, VRAN hosts a Rabbit Management Leadership Program which invites land management professionals such as Parks Victoria officers and local government pest officers to participate in an intensive field "bootcamp" led by recognised experts in rabbit management.

The VRAN "leaps and bounds" learning network allows participants to meet several times a year to share their experiences in rabbit management in various locations and management situations across Victoria, for example visiting a property in North West Victoria with Aboriginal heritage sites that require sensitive management. VRAN has also been a partner in delivering the Victorian Rabbit Management Conference and provides online information on rabbit management through their website.



Initiation

In 2013, the National Rabbit Facilitator Project (NRFP) commenced as a result of collaboration between the Invasive Animals Cooperative Research Centre (IA CRC) and the Victorian Department of Economic Development, Jobs, Transport and Resources.

In 2014, VRAN was established as a new network-based approach, following on from NRFP. The guiding principles of VRAN are:

- Collaboration between diverse rabbit stakeholders
- Co-learning amongst diverse stakeholders
- Co-invest from government, community and the private sector.

Why successful

An impact study of VRAN found that when participants witnessed tangible outcomes, they become motivated to participate in future events (ACIL Allen 2017). Like many environmental initiatives, initial success relies on reliable funding, and VRANs links to the Victoria Government and IA CRC has created funding opportunities. VRAN has successfully utilised these opportunities to generate significant outcomes and impacts through the cycle of activities, outputs, outcomes and impacts.

Application

In the Eastern Region, councils and Network members could directly utilise VRAN by providing opportunities for staff to participate in VRAN activities, either as trainees, or mentors if they possess particular expertise.

The framework of VRAN can be scaled down so participants of VRAN leadership workshops can bring the knowledge back to their local council/community/government to share their knowledge of best practise management and implement in their area.



5

Strategic Direction

5.1 Vision

Working together to minimise the impacts of pest animals across the Region.

5.2 Guiding Principles

The Strategy is underpinned by a set of principles that have been agreed by all stakeholders. Stakeholders will apply these principles to decisions and actions for improved pest management in the region:

1. Pest animal management is tenure blind and focusses on the outcome (e.g. biodiversity asset protection), not just culling pests.
2. Collaboration between contractors, research organisations, councils, community and land managers (e.g. Melbourne Water) is paramount to achieving regional pest control.

3. Sharing of information (pest data, community awareness programs, media releases, mapping etc.) across the Network is essential.
4. Community awareness of, and engagement with, pest issues is vital for effective pest management.
5. Practical monitoring and evaluation techniques that provide timely information are essential for management action.
6. Integrated and coordinated pest management that establishes and utilises best practice methods at landscape scale is the desired approach.
7. Management of invasive species is most cost-effective when new incursions are detected early and rapid responses implemented.
8. Best practice approaches are adopted, which are cost effective and minimise adverse effects of management on public safety, off-target species, the environment and animal welfare.

5.3 Goals and Objectives

The Strategy has four goals, each with objectives that aim to focus regional action and coordination (Table 7).

| Vision: Working together to minimise the impacts of pest animals across the Region. | |
|---|--|
| <p>Goal 1</p> <p>Provide leadership and coordination for the management of priority pest animal species.</p> <p>Objectives</p> <ol style="list-style-type: none"> 1.1 Clarify the roles and accountabilities of all relevant parties. 1.2 Promote adoption of consistent, integrated approaches to priority pest species management. 1.3 Promote and implement collaborative best practice integrated pest management. | <p>Goal 2</p> <p>Increase awareness, understanding and capacity building regarding priority pest animal management.</p> <p>Objectives</p> <ol style="list-style-type: none"> 2.1 Maximise public and community support for priority pest animal management. 2.2 Ensure a comprehensive suite of extension materials available. 2.3 Improve adoption of best practice pest animal management through effective communication, education and training. |
| <p>Goal 3</p> <p>Mitigate the impact of established priority pest animals on biodiversity, primary industry (e.g. agriculture) and social well-being.</p> <p>Objectives</p> <ol style="list-style-type: none"> 3.1 Adopt an integrated, scientific, risk based and humane approach to managing the impacts of priority pest animals. 3.2 Collaboratively develop regional criteria to identify priority assets for biodiversity, primary industry and social well-being. 3.3 Develop impact threshold guidelines to inform response planning. 3.4 Protect water supply catchments. | <p>Goal 4</p> <p>Monitor, evaluate and report to inform and continuously improve priority pest animal management.</p> <p>Objectives</p> <ol style="list-style-type: none"> 4.1 Develop consistent metrics for the assessment of priority pest animal impacts and management efficacy. 4.2 Develop and adopt processes for evaluating implementation and outcomes of the Strategy. 4.3 Develop and adopt reporting processes and structures. |

Table 7. Vision, goals and objectives of the Strategy

5.4 Prioritisation Matrix

Resources will be directed to programs and actions where they will have the greatest effect towards regional goals. The main criteria are threatened species conservation, cost effective control of pests in new and emerging pest locations, impacts on neighbours (safety and production values) and providing continuity to protect community invested habitat regeneration sites.

The investment allocations will be informed by the pest significance and the feasibility of control as outlined in Table 8. The approach to prioritising actions on vertebrate pest animals is informed by the Victorian Invasive Plants and Animals Framework and is based on a risk-based methodology.

- Pest significance is defined by the level of impact to assets. Impact is reflective of extent and abundance and is also a function of site sensitivity. This includes seasonal vulnerability to predation during breeding seasons for threatened species.
- Pest control feasibility is defined as cost of control, current population levels, likelihood of successful control and cumulative gain towards regional landscape. The success of control is a function of clearly defined objectives for control and the suite of control measures available in the target area. The mode of delivery will also determine the success of control. Integrated control of multiple pest species across tenure with community collaboration will be prioritised.

| Pest significance | | | | |
|---|--------------|--------------|--------------|-----------|
| Control Feasibility | Low | Moderate | High | Very High |
| Very high (Eradicate) | High | High | High | High |
| High (Contain) | Medium | Medium | Medium | High |
| Moderate (Asset Based/ Population reduction) | Low | Low | Medium | High |
| Low (Asset Based/Impact reduction) | General Duty | General Duty | General Duty | High |

Table 8. Resource Allocation Prioritisation Matrix

Experience demonstrates that pest control programs are more effective and feasible when part of integrated asset management and targeted early in infestation whilst population numbers are relatively low (Braysher 2017). Therefore high priority is given to initiatives with a high chance of success and or tackling a high level of threat.

Implementation is also influenced by target specificity, availability of control techniques, interest of stakeholders and animal welfare (Braysher 2017). Action plans that are outcome-focused rather than focusing on the pest itself and that build on current efforts to maximum outcome will be prioritised.

The criteria for site selection have been adapted from Melbourne Water Pest Animal Strategy and makes use of DELWP Nature Print decision support tools (Table 9).

| | Critical | High | Medium | Low | Limitations |
|-----------------------------------|----------|------|--------|-----|--|
| 1. Threatened species/communities | X | | | | SMP modelling may require additional local context known/verified assets |
| 2. Human Health | X | | | | Requires reporting of incidents, Gov health directives will be obligate |
| 3. Cultural heritage sites | X | | | | Known/verified assets |
| 4. Sites of biological richness | | X | | | Regional priority based on functional condition |
| 5. Agriculture losses | | X | | | Requires primary producer reports. Neighbourhood cooperation prerequisite. |
| 6. New Incursions | | X | | | |
| 7. Community Cooperative program | | X | | | |
| 8. DELWP/CMA program | | X | | | |
| 9. Incursion pathway | | X | | | Map incursion pathways |
| 10. Existing program | | | X | | |
| 11. Recreation sites | | | X | | |
| 12. Window of opportunity | | | | X | |

Table 9. Site Selection Criteria

6

Regional Action Plan

This Strategy provides an overarching framework within which each stakeholder may develop a local action plan or where there is an existing action plan, seek to prioritise actions that align to the regional objectives.

The Network have agreed to coordinate local pest management programs, share information on restricted chemical products and qualified contractors and share monitoring data where possible. Local pest management programs are defined by:

- Reserve: where the program is taking place
- Site name: clearly identifies where in the reserve(s)
- Target pest animals or weeds: may be multiple species
- Asset at risk: ecological, heritage, agricultural, economic
- Aim of control: eradication, containment or asset protection
- Action: control techniques and monitoring
- Priority: critical, high, medium, low.



Image: David Croft/Department of Planning, Industry and Environment

The focus of the regional action plan is to improve regional capacity, to identify regional actions to coordinate individual plans and to improve the quality of information available to pest managers.

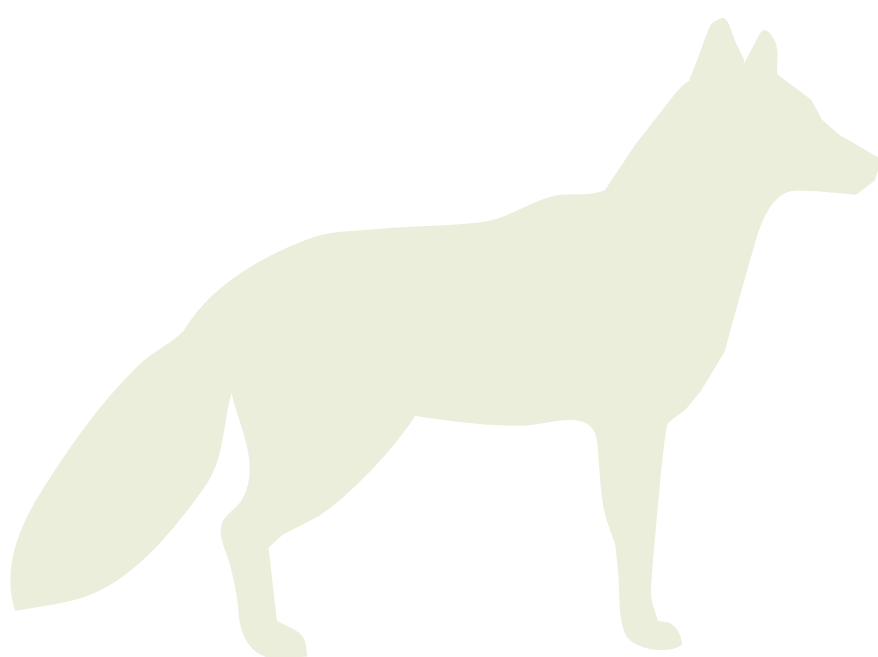
6.1 Key Performance Indicators

Key Performance Indicators (KPIs) are a tool to ensure practices are effective and achieving outcomes. Strategy Performance is reflective of increased information sharing, data driven pest control. KPIs will be monitored and reviewed annually to ensure targeted progress on key objectives and specific project outcomes. The Network will also evaluate project lessons and support continuous improvement for pest management in the region.

6.2 Action Plan

This section sets out the priority actions for pest management in the Eastern Region identified in consultation with participants of workshop 2 (25th February 2020). The regional action plan identifies actions for each of the Strategy objectives, associated outcomes, responsibility, indicative timeframe, resourcing and priority level.

An Action plan template is provided (Volume 2) to enable individual councils and other Network members to develop localised action plans based on what is most suitable and relevant from the Regional Action Plan.



Goal 1: Provide leadership and coordination for the management of priority pest species.

| Objectives and Actions | Outcome | Target pest/s and asset/s | Responsible Parties | Resources | Priority and Timeframe | Key Performance Indicator | Context and Comments |
|---|---|---------------------------|--|-----------------------------------|---|--|---|
| Objective 1.1 Clarify roles and accountabilities of all relevant parties. | | | | | | | |
| Action 1.1.1 Develop a regional governance model. | Recurrent funding model agreed by Network members for baseline activity. | N/A | Network committee. | Network members. | High priority/ first 12 months. | Strategy developed and adopted. Agreed Network model Ongoing participation by network members. | This action focuses on developing a shared and equal process for the allocation of resources to control pests. |
| Action 1.1.2 Establish stakeholder responsibilities in relation to implementation of the Strategy. | Stakeholders confirm that they understand their roles and responsibility to implement the Strategy. | N/A | Lead: Network Committee. | All Network members. | High priority/ foundation activity in the first six months. | Participation by stakeholders confirmed. | Terms of reference. Group protocols. Shared responsibility model. |
| Objective 1.2 Promote adoption of consistent, integrated approaches to priority pest species management. | | | | | | | |
| Action 1.2.1 Promote integrated and strategic pest management supported by a scientific, risk-based and humane approach. | Adoption of scientific risk-based approaches incorporating current best practice in urban, peri-urban and rural contexts. Undertake feasibility studies for novel management approaches. | All | Lead: Network committee Other industry, Ag Vic, DELWP, ARI, CISS. | Network Ag Vic DELWP ARI | High priority/ ongoing. | Progressive uptake of identified approaches. | This action is about ensuring that the approaches used to manage pests are based on the best available information (i.e. safe, effective and humane). Improvements to this approach will be ongoing (e.g. CISS is investigating social barriers to uptake by end users). Importantly, this action is about delivery not research and development. |

| Objectives and Actions | Outcome | Target pest/s and asset/s | Responsible Parties | Resources | Priority and Timeframe | Key Performance Indicator | Context and Comments |
|--|--|---------------------------|---|--|-------------------------------|---|---|
| <p>Action 1.2.2</p> <p>Develop a regional guide on humane pest animal control options and disposal of carcasses.</p> <p>Educate public on ethics of humane control and euthanasia to encourage landowners to actively participate in control programs. Links to Action 2.1.1</p> | <p>1) Safe and legal use of toxins, traps and firearms.</p> <p>2) Responsible and safe disposal of animal carcasses.</p> | All | <p>Lead: Network</p> <p>DELWP</p> <p>Ag Vic</p> <p>Landholders</p> | <p>DELWP</p> <p>Ag Vic</p> <p>Pest Smart</p> | Low priority/ within 5 years. | Agreed adoption of guide by network members. | Best practice integrated management should follow associated SOPs developed by Centre for Invasive Species Solutions (Pestsmart). |
| Objective 1.3 Promote and implement collaborative best practice integrated pest management. | | | | | | | |
| <p>Action 1.3.1</p> <p>Facilitate partnership models that involve community, government and industry pest stakeholders.</p> <p>Programs should be community-led and supported by state and local government agencies.</p> | Increased regional capacity for pest management. | N/A | <p>Landcare.</p> <p>Land managers.</p> <p>Lead: Network committee</p> <p>Other: industry, DELWP, Ag Vic, ARI.</p> | <p>Network members</p> <p>Industry</p> <p>DELWP, Ag Vic</p> <p>Landcare.</p> <p>Land managers.</p> | Medium priority/ ongoing | <p>Existing relationship are maintained and enhanced where necessary.</p> <p>New partnerships established where gaps in programs exist.</p> | <p>There are current strong network partnerships in place.</p> <p>New partnerships should aim to improve integrated management across the region and may include the addition of Ag Vic to the Network.</p> |

| Objectives and Actions | Outcome | Target pest/s and asset/s | Responsible Parties | Resources | Priority and Timeframe | Key Performance Indicator | Context and Comments |
|---|--|---------------------------|--------------------------|--|-------------------------------|--|---|
| Action 1.3.2 Develop a regional investment Strategy to be implemented in two parts: (1) strategic use of existing resources, and (2) seeking grants for priority projects. | Regional investment Strategy developed and adopted. Project ready plans. | All | Lead: All | Led by a regional coordinator focused on fundraising. Network members Industry DELWP, Ag Vic Landcare Land managers Philanthropic organisations | High priority/ within 2 years | Strategy Funding bids for the protection of key biodiversity assets and to support local programs that are integrated within a regional program 3 grants received for control programs by the end of year 10. | This action recognises that funding for pest control is limited, and that each council has different priorities and budgets The development of an agreed fundraising Strategy applicable to a broad range of programs will assist Network members in leveraging funding from a variety of sources including government. The fundraising Strategy should be led by a coordinator. |
| Action 1.3.3 Advocate for the instatement of a Regional Pest Animal Coordinator and Steering Committee. | 1) Establish a joint funding model to support engagement of regional pest animal coordinator. 2) Regional Pest Animal coordinator instated in the region. | N/A | Lead: Network committee. | Network members DELWP Ag Vic | Low priority/5 years. | Regional Pest Animal coordinator instated in the region. | This action aims to instate a Regional Pest Animal coordinator to facilitate integrated pest management and assist Network members in pest animal prioritisation, best practice control techniques and advocacy. |

Goal 2: Increase awareness, understanding and capacity building regarding priority pest animal management.

| Objectives and Actions | Outcome | Target pest/s and asset/s | Responsible Parties | Resources | Priority and Timeframe | Key Performance Indicator | Context and Comments |
|--|---|---------------------------|--|---|---|---|---|
| Objective 2.1 Maximise public and community support for priority pest animal management. | | | | | | | |
| Action 2.1.1 Develop Regional Pest Species Communication and engagement Plan. | Improved consistency across Network members. Engagement with Strategy (and science underpinning it) | All | Lead: Network committee. | Existing council and Network member communication plans and teams. | High priority/ in the first 12 months. | Gap analysis on communications needs/requirements is completed. Plan endorsed by Network members. Community opposition to pest control programs and techniques reduced. | The communications plan should consider all pest issues, including urban, peri-urban, biodiversity protection, agriculture, human safety and raising awareness of control techniques. The plan should consider the use of 'champions' to deliver key messages. This may include networking for effective regional delivery. |
| Action 2.1.2 Implement Regional communications plan (biodiversity and safety outcomes focused). | Media plan. Shared brochures developed. Primary and secondary stakeholders aware of regional Strategy initiative. | All | Lead: Network committee. Other: Network members, landholders. | Network members Existing communication plans at Councils, Parks Vic and Melbourne Water. Website content. | 2-5 years. | Annual collation and reporting of customer service register of pest reports. Measure public pest animal awareness and understanding year zero, five and ten. | Consistency of key messages on purposes, processes and progress are delivered. Use of existing communication outlets. |
| Action 2.1.3 Evaluate the effectiveness of the communications and engagement plan. | Effectiveness and improvements assessed where appropriate. | All | Lead: Network committee Other: Network Members | Network members Existing communication plans at Councils, Parks Vic and Melbourne Water. | Components reviewed annually, comprehensive review after 5 years. | Annual review as part of Network meeting. Comprehensive review at 5 years. Feedback is incorporated into updated plan. | Feedback needs to be collected and collated from primary and secondary stakeholders. Mechanisms for the review process need to be defined. |

| Objectives and Actions | Outcome | Target pest/s and asset/s | Responsible Parties | Resources | Priority and Timeframe | Key Performance Indicator | Context and Comments |
|--|--|--|--|--|--------------------------|--|--|
| Objective 2.2 Ensure a comprehensive suite of extension materials available | | | | | | | |
| Action 2.2.1 Leverage existing education support materials to create regional resource kit. | Widely available, accessible pest animal management information. Promotion of FeralScan. | All | Lead: Network members Others: Ag Vic, DELWP, landholders, Landcare. | ARI, PestSmart, Ag Vic. | Medium priority/5 years. | Agreed list of current resources. New materials developed as appropriate. | Adapt existing material .Promote best practice humane control. Support distribution to community groups through existing channels. |
| Objective 2.3 Improve adoption of best practice pest animal management through effective communication, education and training. | | | | | | | |
| Action 2.3.1 Promote and support collaborative programs to educate the community on implementation of best practice pest control. Create regional communication/ media plan with shared set of brochures and messages. | 1) Landholders supported to implement best practice through education and training (e.g. information kits, training days, field days). 2) Best practice pest management accepted and implemented by communities. E.g. FeralScan reporting. | All. Start where there is already community action. | Lead: Network members Others: Ag Vic, DELWP, landholders, Landcare | Network members Industry DELWP, Ag Vic Landcare Land managers, CMA | High priority/ ongoing | Increased participation of landholders, community in pest control programs, monitoring and reporting observations. Number of workshops/ community meetings delivered. Before/after participant questionnaires. | This action is about group participation, coordination, cooperation and support of nil-tenure approach. |

| Objectives and Actions | Outcome | Target pest/s and asset/s | Responsible Parties | Resources | Priority and Timeframe | Key Performance Indicator | Context and Comments |
|--|--|---------------------------|---|--|-------------------------|---|--|
| <p>Action 2.3.2</p> <p>Use social and traditional media to promote local and regional pest management approaches.</p> | <p>1) Delivery of positive local implementation of best practice enhanced and maintained, using the most appropriate method/s.</p> <p>2) Community's general understanding of the benefits of a cooperative approach to pest management broadened.</p> | All | <p>Lead: Network members</p> <p>Other: Ag Vic, CISS</p> | <p>Existing council media networks.</p> <p>CISS</p> <p>DELWP, Ag Vic</p> | Medium priority/ongoing | <p>Media Monitors summaries/ metric (e.g. number of social media posts, e-newsletters delivered).</p> <p>New technologies engaged.</p> <p>Social media hits, webpage visits</p> | <p>Media is changing. The Strategy needs to consider new tools and emerging techniques to engage all stakeholders (rural, peri urban and urban) in pest animal management.</p> <p>There is a need to understand the broader demographic of all stakeholders and target methods to a specific audience.</p> |
| <p>Action 2.3.3</p> <p>Increase community capacity to enable those involved with pest animal control to have access to techniques and the capability to use them with appropriate levels of competence and humaneness.</p> | <p>1) Techniques and tools used by land managers and landholders to manage priority pest animals in a safe, efficient and humane manner.</p> <p>2) Landholder and land manager capacity increased to through the provision of advice and in-kind support.</p> <p>3) Identify and provide a list of licensed shooters to all Network members.</p> | All | <p>Lead: Network members</p> <p>Other: Ag Vic, CISS</p> | <p>CISS</p> <p>DELWP, Ag Vic</p> <p>Industry</p> | High priority/ongoing | <p>Number of meetings, field days and demonstrations provided to landholders (annual).</p> <p>Number of stakeholders trained and effectiveness of transfer of training to pest animal management practices.</p> <p>Before/after participant questionnaires.</p> | <p>This action is about landholders having the competency to use pest control techniques. This includes landholders having the ability to apply/access funds for community-led action.</p> <p>Field days, demonstrations may be mechanisms used.</p> |

Goal 3: Mitigate the impact of established priority pest animals on biodiversity, agriculture and people.

| Objectives and Actions | Outcome | Target pest/s and asset/s | Responsible Parties | Resources | Priority and Timeframe | Key Performance Indicator | Context and Comments |
|--|--|------------------------------------|--|--|-----------------------------|---|--|
| Objective 3.1 Adopt an integrated, scientific, risk based and humane approach to managing the impacts of priority pest animals. | | | | | | | |
| Action 3.1.1 Advocate for development of collaborative, peri urban fox initiative (local pest action plans) | Coordinated, consistent timing and methods across initiative partners) Strategy implemented by stakeholders in a coordinated in a collaborative manner with consistent timing and methodology. Community led programs directly supported by government agencies | Fox Local biodiversity hotspots | Councils, Melbourne Water, DELWP, PV | FeralScan, Strategic Management Prospects Tool, Ag Vic. Network to consider funding bids for protection of key natural assets from fox | High priority/ 1-3 years | Local action plans developed. Fox initiative areas identified, mapped and shared. Shared survey data on pest extent and distribution. | Integrated pest animal management considered trophic effects post control. |
| Action 3.1.2 Facilitate coordinated rabbit control for biodiversity hotspots and targeted community recreation reserves, infrastructure: buildings, roads, water infrastructure | Regular multi stakeholder information sharing and collaborative action plans. Increased rabbit control activity. Feasibility assessment of a Rodinator program Increased understanding of landholders obligations and ethical control options. | Rabbit. Recreation reserves. | Control: all network members, public and private landholders, Landcare. Biological control: DELWP, ARI. | Existing community groups/networks, Councils, Ag Vic, DELWP, PPCMA, FeralScan, CISS, Strategic Management Prospects Tool. Shared contractor information (limited resource). | High priority/ ongoing. | Number of control programs implemented. Revegetation regeneration success (if applicable) measured using standard indices. Monitor asset condition. | Complimentary public awareness initiative to educate about ethics of and control measures to change politics/public perception. Practical field days demonstrating warren jamming and complimentary techniques. |

| Objectives and Actions | Outcome | Target pest/s and asset/s | Responsible Parties | Resources | Priority and Timeframe | Key Performance Indicator | Context and Comments |
|---|--|--|---|--|-------------------------|---|---|
| Action 3.1.3 Facilitate cross tenure rabbit control in partnership with farming community | Increased information sharing. | Rabbit. Agricultural assets. | Ag Vic, private landholders, Network members. | Ag Vic, ARI | High priority/2-5 years | Number of control programs implemented. | |
| Action 3.1.4 Invest in regional deer information project. Map deer corridors, roadside hotspots, current control locations, at risk biodiversity hotspots, containment areas. Develop information sharing protocols and agree on monitoring standards. | Improved baseline information for control planning. Increased capacity for ongoing data improvements for deer management. | Deer. Priority focus on new dispersal areas in Knox, Manningham, Maroondah, Boroondara, Yarra River, Diamond Creek. | All network members, public and private landholders, Landcare | Existing community groups. Councils, DELWP, PPCMA, FeralScan, Ag Vic. | High priority/1-2 years | Project ready resource base. Improved data coverage and consistency. | Post fire priority. System to register and collate deer complaints received by councils annually. |
| Action 3.1.5 Advocate for legislation change about pest classification of deer. | Reduced complexity of feral deer controls. One state government department responsible for controlling deer across land tenure. | Feral Deer | Network | Network members, strategy information, deer impact research, elected representatives | High priority/Ongoing | Regulation change | Currently there is not one government department responsible for managing deer across land tenure due to the protection of deer under the Wildlife Act as a game species. |

| Objectives and Actions | Outcome | Target pest/s and asset/s | Responsible Parties | Resources | Priority and Timeframe | Key Performance Indicator | Context and Comments |
|---|--|--|--|---|---------------------------|--|---|
| Action 3.1.6 Host an annual deer forum/workshop. | Knowledge and data sharing amongst Network members, community participants and experts. Improved targeted onground works. | Feral deer Agricultural and environmental assets | Network | Network members, Landcare, Victoria Police, Relevant Universities & researchers, Professional Deer Controllers | Medium priority/2-3 years | Deer Forum conducted annually Outcomes and actions for forum members developed and reported. | This annual deer forum will be part of the existing Yarra Catchment Deer Management Forum. |
| Action 3.1.7 Coordinate targeted culling program | To limit spread in new dispersal areas. To reduce safety risks in identified traffic hot spots | Deer. Dispersal areas include Knox, Manningham, Boroondara, Yarra River and Diamond Creek | Network delegated working group. May include community group representatives and or expert consultants | Partnerships building from existing collaboration. Regional communication strategy. Hotspot data extracted FeralScan intersected road network data. Professional Deer Controllers, Researchers | High priority/1-3 years | Cross tenure participation Reduced vehicle collisions (new register protocols) Reduced rate of spread observed (qualitatively assessed referencing sightings, complaints and water quality data) | Licensed shooters need a Public Place Permit to operate in built up or populous areas. Work with DELWP to develop an urban and peri urban fire arms protocol for deer control. |

| Objectives and Actions | Outcome | Target pest/s and asset/s | Responsible Parties | Resources | Priority and Timeframe | Key Performance Indicator | Context and Comments |
|---|--|--|--|--|--------------------------------|---|--|
| <p>Action 3.1.8</p> <p>Coordinate a targeted Crown land baiting program across high priority areas.</p> | <p>To protect high priority crown land assets to minimize impact on native wildlife from cat predation.</p> | <p>Feral cats on crown land including unregistered stray cats.</p> <p>Priority asset – nationally significant populations of threatened species, Yellingbo, Western Port RAMSAR and SMP high priority locations.</p> | <p>All public and private land managers:</p> <p>Parks Victoria, DAWC, Councils, Melbourne Water, DELWP, Vic Roads.</p> | <p>Information:</p> <p>Ag Vic, CISS, Strategic Management Prospects Tool.</p> <p>Baiting permits, baits, cage traps, field staff, transport, carcass disposal plan</p> | <p>High priority/1-3 years</p> | <p>Reduction in cat predation of native species at target locations.</p> <p>Number and type of control programs implemented.</p> <p>Number of off-target animals trapped.</p> | |
| <p>Action 3.1.9</p> <p>Adopt a cat curfew or containment of domestic cat policy to be promoted throughout the region.</p> | <p>Consistent cat messaging encouraging responsible domestic cat management. Widespread observation of local orders.</p> | <p>Stray domestic cats roaming native habitat areas.</p> | <p>Cat owners.</p> <p>Local vets (advocates).</p> | <p>Shared information booklets, Feralcatscan website, joint information seminars.</p> | <p>Medium priority.</p> | <p>Regional cat curfew implemented.</p> <p>Number of cats recorded outside of curfew and number of penalties enforced.</p> | <p>Co-ordinated communications (see Action 2.1.1).</p> |

| Objectives and Actions | Outcome | Target pest/s and asset/s | Responsible Parties | Resources | Priority and Timeframe | Key Performance Indicator | Context and Comments |
|---|--|--|--|--------------------------------------|--------------------------|--|--|
| Action 3.1.10 Run trial Common (Indian) Myna control program using complimentary control techniques to establish the evidence base of effective methods and program requirements for region-wide roll out. | Promote annual, seasonal control Oct-Jan using complimentary control options. All trapping to be conducted in accordance with PestSmart BIR002. Change public perception of euthanasia so that community members with tools (e.g. traps, training, resources) will then proceed with euthanasia. | Common (Indian) Myna. Starting with areas where there is a community group willing to act. | All network members, public and private landholders, Landcare. Initiatives should be community-led (e.g. friends' networks, environmental groups) and supported by councils. | Network members. Environment groups. | Low priority/ 3-5 years. | Before/after Common (Indian) Myna counts at trial sites Native bird diversity at targeted sites Community re-engagement in myna management | Simple "how-to" message, and effective communication (see Action 2.1.1). |

Goal 4: Monitor, evaluate and report to inform and continuously improve priority pest animal management.

| Objectives and Actions | Outcome | Target pest/s and asset/s | Responsible Parties | Resources | Priority and Timeframe | Key Performance Indicator | Context and Comments |
|---|--|---|---|--|--------------------------------|---|---|
| Objective 4.1 Develop consistent metrics for the assessment of priority pest animal impacts and management efficacy. | | | | | | | |
| Action 4.1.1 Establish data working group | 1) Data sharing protocols between Network members developed. 2) Broker data sharing agreement with Feral Scan | All | Lead: Network committee. Other: ARI, Ag Vic, CISS. | Existing Network member GIS capabilities, FeralScan, Ag Vic, CISS. | High priority/ year 1 | Data sharing supported by Network members. Number of data points added to FeralScan in the Eastern Region. | |
| Action 4.1.2 Develop information standards and recommended pest animal metrics | Improved data consistency Standard asset impact assessment methods | All | Lead: Network committee. Other: ARI, Ag Vic, CISS. | DELWP, ARI, Ag Vic, SMP tool. Animal welfare groups. | High priority/ year 1 | Agreed metrics are incorporated into local Action Plans. | Leverage existing standards eg Melbourne Water, DELWP, ARI, Invasive CRC/ Committee. |
| Objective 4.2 Develop and adopt processes for evaluating implementation and outcomes of the Strategy. | | | | | | | |
| Action 4.2.1 Develop a monitoring and evaluation framework (and timetable). | Constructive review of the delivery and outcomes of the Strategy. | Rabbits, Feral Cats, Deer, Mynas, Foxes | Lead: Network committee. | Network members, Ag Vic, CISS. | Medium priority/after 5 years. | Independent review undertaken. | |
| Action 4.2.2 Implement the recommendations of the mid-term reviews. | Recommendations of independent review adopted by stakeholders where appropriate | | Lead: Network committee. | Network members, Ag Vic, CISS. | Medium priority/after 6 years. | Recommendations are implemented. | This action is about continually improving the implementation and effectiveness of the Strategy delivery. |

| Objectives and Actions | Outcome | Target pest/s and asset/s | Responsible Parties | Resources | Priority and Timeframe | Key Performance Indicator | Context and Comments |
|--|--|---------------------------|---|---|-------------------------------------|--|----------------------|
| Objective 4.3 Develop and adopt reporting processes and structures. | | | | | | | |
| Action 4.3.1 Progress reporting | <p>Analysis and reporting of collated data on the impacts of priority pest animals.</p> <p>Improved regional understanding of pest animal management which guides investment based on analysis Informed stakeholder network.</p> | | Lead: Network committee. Other: ARI, Ag Vic, CISS. | Network members FeralScan, Ag Vic, CISS. | Medium priority/ within 5 years. | Reports are distributed to stakeholders. | |

7

Measuring Success and Continuous Improvement

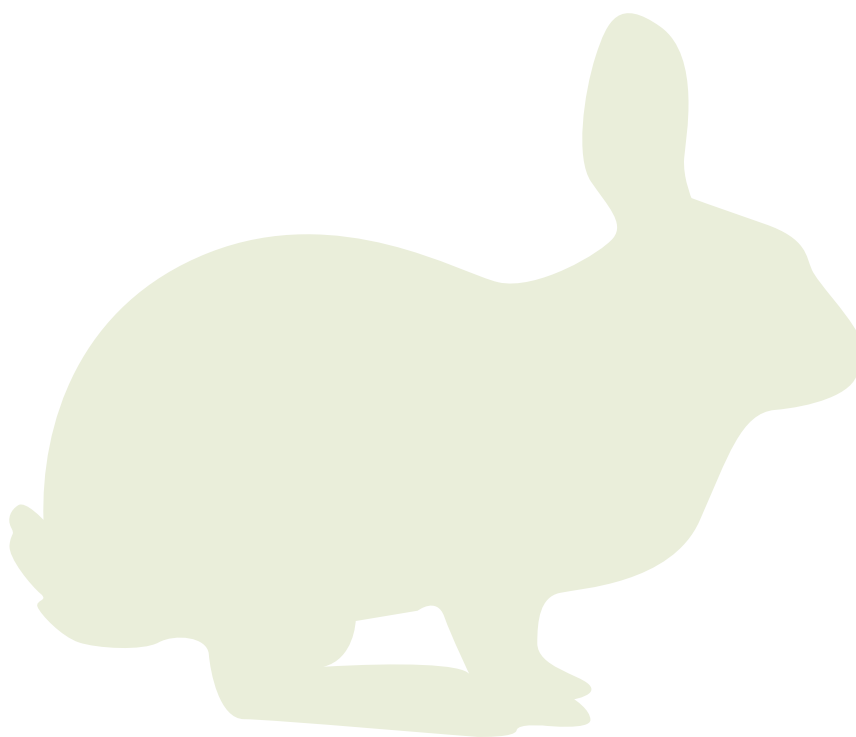
- The development and monitoring toward Key Performance Indicators (KPIs) is a critical component of this Strategy. Monitoring indicators provides information needed to:
- Establish baseline data to guide management of priority pest species.
- Identify priorities for immediate and future management planning in the Region.
- 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 are set for each of the priority pest species are outlined in Section 7.1 below.

7.1 Adaptive Management

The Network provides a collaborative mechanism to continually share, grow and improve capacity across the Eastern Region to manage pest animal impacts. A key part of improved outcomes is to nurture respectful, candid and open relationships that facilitate cyclical learning and adaptive management. This is valued by stakeholders and reflected in the case studies included in this Strategy.

Pest management is focused on minimising impacts to and protecting key assets in a coordinated manner. Therefore, in addition to the collation of regional data undertaken for this Strategy, it is important that each activity developed in response to this Strategy includes an investment in improved baseline data on the region's pest animal species distribution and impacts. Research indicates that evaluating pest animal control will require acceptance and reporting of data uncertainties (Braysher 2017). Adaptive management is a structured, iterative process of decision making in the face of uncertainty, which uses monitoring to reduce uncertainty over time. In this way, adaptive management helps to refine the effectiveness of pest management and helps the Network and other land managers to better understand how the regional ecosystems respond. This strategic plan is designed to alter the current degradation pathway and improve outcomes from invasive species management investments.



8

Reference List

ACIL Allen Consulting (2017). Victorian Rabbit Action Network – Impact Analysis. Online: <https://rabbitaction.com/wp-content/uploads/2018/08/VRAN-Impact-Analysis.pdf>

Agriculture Victoria Invasive Plants and Animal Policy Framework. 2009 <http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/protecting-victoria/invasive-plants-and-animals/invasive-plants-and-animals-policy-framework>

Algar, D., & Smith, R. (1998). Approaching Eden. *Landscape*, 13(3), 28-34.

Braysher, M. (2017). *Managing Australia's Pest Animals: A guide to strategic planning and effective management*. CSIRO Publishing, Clayton South, Victoria.

Centre for Invasive Species Solutions. (2014) Pest Smart Common (Indian) Myna Fact Sheet. Available: https://www.pestsmart.org.au/wp-content/uploads/2017/10/IMFS1_myna_web.pdf

Coutts-Smith AJ, Mahon PS, Letnic M and Downey PO (2007) The threat posed by pest animals to biodiversity in New South Wales. Invasive Animals Cooperative Research Centre, Canberra

- Cupples, J. B., Crowther, M. S., Story, G., & Letnic, M. (2011). Dietary overlap and prey selectivity among sympatric carnivores: could dingoes suppress foxes through competition for prey?. *Journal of Mammalogy*, 92(3), 590-600.
- Department of Agriculture (2017). Australian Pest Animal Strategy 2017 to 2027. Available: <http://www.agriculture.gov.au/pests-diseases-weeds/pest-animals-and-weeds/review-aus-pest-animal-weed-Strategy/aus-pest-animal-Strategy>
- Davis, N.E., Bennett, A., Forsyth, D.M. et al. (2016). A systematic review of the impacts and management of introduced deer (family Cervidae) in Australia. *Wildlife Research* 43, 515-532.
- Doherty, T. S., & Ritchie, E. G. (2017). Stop jumping the gun: a call for evidence-based invasive predator management. *Conservation Letters*, 10(1), 15-22.
- Doherty, T. S., Dickman, C. R., Johnson, C. N., Legge, S. M., Ritchie, E. G., & Woinarski, J. C. (2017). Impacts and management of feral cats *Felis catus* in Australia. *Mammal Review*, 47(2), 83-97.
- DPI (2019) Vertebrate Pesticide Manual. NSW Government. <https://www.dpi.nsw.gov.au/biosecurity/vertebrate-pests/publications/nsw-vertebratepesticide-manual>
- Gill AM, Woinarski JCZ, York A. (1999). Australia's biodiversity - Responses to fire. Biodiversity Technical Paper No. 1 Canberra: Environment Australia.
- Gong W, Sinden J, Braysher M and Jones R (2009). The economic impacts of vertebrate pests in Australia. Invasive Animals Cooperative Research Centre, Canberra.
- Grarock, K., Tidemann, C. R., Wood, J. T., & Lindenmayer, D. B. (2014). Are invasive species drivers of native species decline or passengers of habitat modification? A case study of the impact of the common (Indian) myna (*Acridotheres tristis*) on Australian bird species. *Austral Ecology*, 39(1), 106-114.
- Griffiths, R. (2011). Targeting multiple species—a more efficient approach to pest eradication. *Island Invasives: Eradication and Management. International Union for Conservation of Nature*, 172-176.
- Hunter, D. O., Britz, T., Jones, M., & Letnic, M. (2015). Reintroduction of Tasmanian devils to mainland Australia can restore top-down control in ecosystems where dingoes have been extirpated. *Biological Conservation*, 191, 428-435.
- Low T. (2008). Climate Change and Invasive Species: A Review of Interactions. Canberra: Biological Diversity Advisory Committee.
- McLeod S (2009) 'Proceedings of the National Feral Deer Management Workshop', Canberra, November 2005, Invasive Animals Cooperative Research Centre, Canberra.
- McLeod, R., & Norris, A. (2004). Counting the cost: impact of invasive animals in Australia, 2004 (p. 71). Canberra: Cooperative Research Centre for Pest Animal Control.

Melbourne Water (undated) Melbourne Water Pest Animal Strategy.

Moodie, E. (1995). The potential for biological control of feral cats in Australia, Unpublished report to the Australian Nature Conservation Agency: Canberra.

Newsome A. E. (1991). Feral cats: an overview. In: The impact of cats on native wildlife. Pp. 7-13. In: Potter C. (Ed.). Impact of Cats on Native Wildlife: Proceedings of a Workshop, 8-9 May 1991, Canberra. Australian National Parks and Wildlife Service, Endangered Species Unit, Canberra.

Pearson L, Houghton K (2018) The Case for Collaboration, What It is and How to Do it Well. Regional Institute Australia, Canberra Australia

Pestsmart 2019. RAB011: Bait delivery of Rabbit Haemorrhagic Disease Virus (RHDV1) K5 strain. Available <https://www.pestsmart.org.au/bait-delivery-of-rhdv/>

Port Phillip and Western Port Catchment Management Authority (2011) Port Phillip and Western Port Invasive Plants and Animal Strategy.

Reddiex, B., & Forsyth, D. M. (2004). Review of existing red fox, feral cat, feral rabbit, feral pig and feral goat control in Australia. II. Information gaps. Arthur Rylah Institute for Environmental Research, Department of Sustainability and Environment, Melbourne. <http://www.deh.gov.au/biodiversity/invasive/publications/information-gaps/pubs/information-gaps-final.pdf> (Accessed December 2006).

Sansom G, James J, Artist S 2015 Regional Collaboration and Shared Services: What Works? Prepared for LGNSW Learning Solutions, Sydney, Australia.

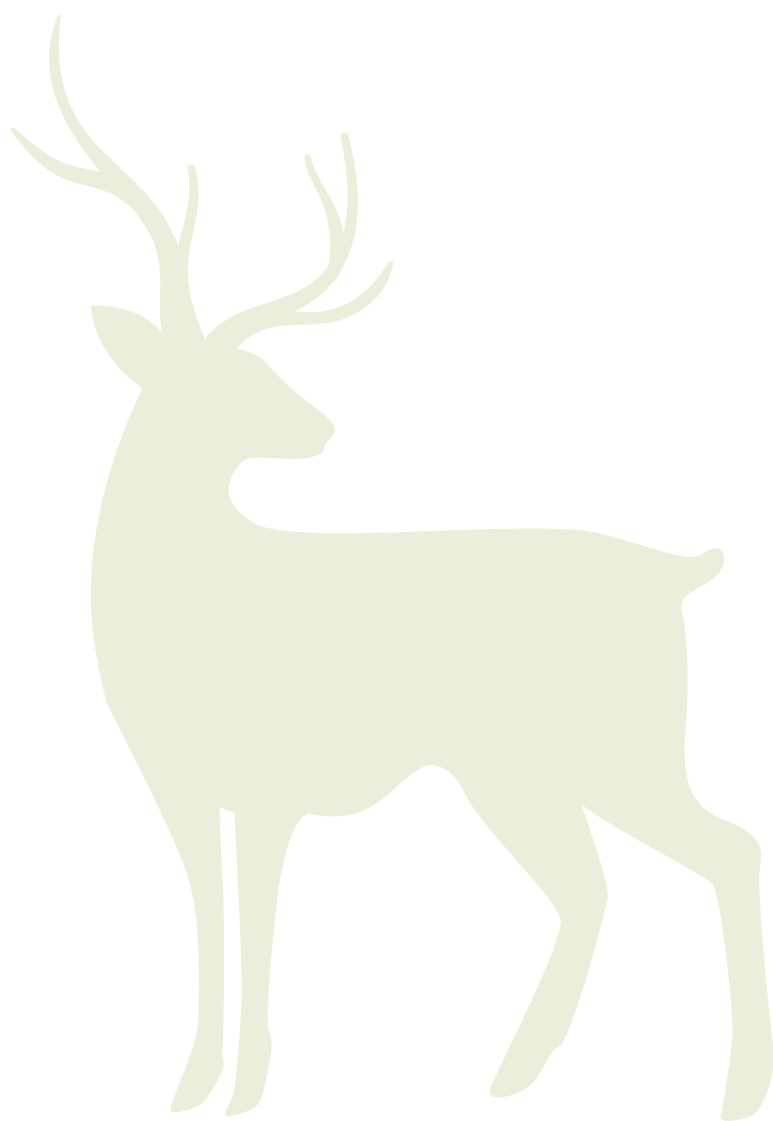
Somerville, Gibbs (2012) Legal and Governance models for Shared Services in Local Government. Australian Centre for Excellence in Local Government.

Steffen W, Burbidge A, Hughes L, Kitching R, Lindenmayer D, Musgrave W, Stafford Smith M, Werner P. 2009. Australia's Biodiversity and Climate Change: A strategic assessment of the vulnerability of Australia's biodiversity to climate change. Technical synthesis of a report to the Natural Resource Management Ministerial Council commissioned by the Australian Government. Canberra: Department of Climate Change. www.climatechange.gov.au/impacts/biodiversity_vulnerability.html

Thylation 2019. Felixers by Thylation. Available <https://thylation.com/contact-us/>

Woinarski, J. C., Burbidge, A. A., & Harrison, P. L. (2015). Ongoing unravelling of a continental fauna: decline and extinction of Australian mammals since European settlement. *Proceedings of the National Academy of Sciences*, 112(15), 4531-4540.

Yarra Ranges Council <https://www.yarraranges.vic.gov.au/Council/Corporate-documents/Policies-strategies/Flora-Fauna-Plan>



Abbreviations

| Abbreviation | Description |
|--------------|---|
| Ag Vic | Agriculture Victoria |
| ARI | Arthur Rylah Institute |
| CISS | Centre for Invasive Species Solutions |
| LGA | Local Government Area |
| PPWCMA | Port Phillip and Westernport Catchment Management Authority |
| DELWP | Department of Environment, Land, Water and Planning |
| CaLP | Catchment and Land Protection Act 1994 |
| EPBC | Environment Protection and Biodiversity Conservation Act 1999 |
| SWOT | Strengths, Weaknesses, Opportunities, Threats |
| CMA | Catchment Management Authority |
| SOP | Standard Operating Procedure |
| ToC | Theory of Change |
| KPI | Key Performance Indicator |
| MERI | Monitoring, Evaluation, Reporting, Improvement Strategy |

