6.3 Policy Reports

6.3.1 Eastern Region Pest Animal Strategy 2020-2030

File Reference: REC-0003052884
Responsible GM: Peter Benazic
Author: Marianne Sawyer

Recommendation(s)

That Council:

- Endorse the Eastern Region Pest Animal Strategy.
- Authorise the CEO to approve expenditure up to $10,000, as a contribution towards the network Regional Pest Animal Coordinator.

Attachments

1. Eastern Region Pest Animal Strategy 2020-2030 Volume 1 [**6.3.1.1** - 80 pages]
2. Eastern Region Pest Animal Strategy 2020-2030 Volume 2 [**6.3.1.2** - 64 pages]

Executive Summary

The Eastern Region Pest Animal Network (the Network), of which Cardinia is a member, is seeking endorsement from government agencies of the eastern region of Melbourne, for the Eastern Region Pest Animal Strategy 2020-2030, with a commitment to work in partnership towards its implementation. (See attached Volume 1 & 2).

Endorsement means committing to work with other endorsing organisations towards a common long-term Vision. The Strategy identifies four main goals. Actions to achieve these goals can be tailored to suit each individual endorsing organisation. Organisations are not bound to undertake all actions but continue to work collaboratively with Network partners.

Background

Invasive species pose one of the most significant threats to Australia's ecosystems and agricultural enterprises. In Victoria, pest animal invasions have resulted in sustained declines in biodiversity, reduction in land productivity. Despite pest management being regarded as a priority by many government bodies, community groups and landowners, pest animals continue to increase in range and density.

In 2016, the Eastern Region Pest Animal Network (The Network) was established across Melbourne's East, consisting of a mix of local government, statutory agencies and Victorian government bodies. These include 13 Local Government Authorities in eastern Melbourne, Parks Victoria, DELWP, Vic Roads, Melbourne Water and Port Phillip and Westernport Catchment Management Authority.
This voluntary network came together with the understanding that pest animal management is best implemented at a regional scale, with well-coordinated action across land tenures, sharing knowledge, capacity and resources.

The Network has worked together to develop the Eastern Regional Pest Animal Strategy 2020-2030, with the main purpose to provide a clear direction that coordinates these agencies for

the management of five priority pest species across eastern Melbourne, European Fox, Feral Cat, European Rabbit, Feral Deer and Common Myna.

Twelve members councils of the Network contributed funds to engage Ecological Australia (ELA) to facilitate the development of this Strategy, with Cardinia contributing $5,000. ELA carried out the desktop research and facilitated a consultation process which included a mix of online surveys, interviews and workshops to draft the strategy with 18 government agencies.

The Strategy sets a common vision 'working together to minimise the impacts of pest animals across the Region.' The vision is supported with four main goals and set of actions.

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

The strategy addresses current and potential pest animal problems that impact on primary industries, natural ecosystems and social well-being across both urban and peri urban environments in the Eastern Melbourne region. It establishes a region-wide planning framework to provide clear direction for the management of the five priority pest species.

The Strategy provides a long-term coordinated approach to pest animal management. It is envisaged that each agency will tailor their own action plan to meet the long-term goals. A template for this is provided in the strategy.

The Strategy itself has a lifespan of ten years. Strategy effectiveness will be monitored and assessed by the Network according to predefined Key Performance Indicators.

Policy Implications

The strategy is consistent with the:

- Sustainable Environment Policy 2018-28.
- Liveability Plan 2019-2027 - Liveability Policy domain - Open spaces and places. Action 7.4 Protecting and enhancing the environmental quality of open spaces and places.
- Biodiversity Conservation Strategy - Action 15 - Continue to support Eastern Region Pest Animal Network initiatives including the development of a regional Pest Animal Management Plan.

Relevance to Council Plan

The strategy goals and objectives align with the following objectives of the Council Plan:
3.3.7 Protect and improve biodiversity by increasing the area of natural ecosystems across the Shire.
3.3.9 Manage agricultural land use by supporting farmers to utilise sustainable farming practises.
3.4 Natural and built environments supporting the improved health and wellbeing of our communities

Consultation/Communication

ELA carried out the desktop research and facilitated a consultation process which included a mix of online surveys, interviews and workshops to draft the strategy with 18 government agencies.

Financial and Resource Implications

Council contributed $5,000 towards the development of the strategy in 2019-2020.The Strategy enables all stakeholders to work collaboratively on a regional scale towards long-term pest animal management.

Becoming a regional player means that pest animal issues don't conform to land boundaries and that shared resources and investment need to be apportioned to where they have the greatest benefit. It is envisaged that once this strategy is endorsed, Pest Animal Local Action Plans (see Volume 2 for Template) will be prepared by individual councils, and costed on a project by project basis, in collaboration with relevant land managers including community groups and adjacent municipalities. As part of this, opportunities will arise for cost sharing, funding leveraging, and seeking external grant programs which support pest animal management outcomes.

Pest Animal Local Action Plans will be consistent with other Council adopted strategies including the Biodiversity Conservation Strategy and go toward meeting the long-term goals for pest animal management on a region scale.

Another key action identified for Network within the next 2 years, is to establish a joint funding model to support the engagement of a Pest Animal Coordinator to assist the Network in achieving its goals.

Conclusion

As a member of the Eastern Region Pest Animal Network, Cardinia has participated in the development of the Eastern Region Pest Animal Strategy over the past 2 years. The strategy provides a framework guiding the effective management of pest animal species across municipalities to achieve results on a regional scale. It covers management considerations for five dominant pest animal species, and advocates for consistency and collaboration across councils when planning local area pest animal management plans.

Upon endorsement of this strategy, the next step for Cardinia is to seek opportunities for funding to develop collaborative pest animal management programs for the protection of biodiversity in hotspot spot areas, and to work with the network to establish a joint funding model to support the engagement of a Regional Pest Animal Coordinator.

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

Document Tracking

Project Name	Eastern Region Pest Animal Network
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Project Manager	Alastair Jones
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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.

Contents

Acknowledgements

This document has been prepared by Eco Logical Australia Pty Ltd with support from Eastern Region Pest Animal Network. The authors would particularly like to thank the Steering Committee members Nadine Gaskell, Samantha Bradley, Rob Jones, Marianne Sawyer, Kym Saunders, Corinne Mays, Brad Tadday, Jared Polkinghorne, Kirsten Reedy and Amy Shaw for their leadership and guidance. Thank-you to all contributors including Peter West, Mike Hall, Geoff MacFarlane, Katie Maric, Michelle Hanslow and Billy Geary. This Strategy is a team effort and we thank all participants in the workshops and surveys.

Abbreviations

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

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 *(Vulpes vulpes)*	Established pest animal
Cat *(Felis catus)*	**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. Not declared on private land. **Stray** Not declared **Domestic** Not declared
European Rabbit *(Oryctolagus cuniculus)*	Established pest animal.
Feral Deer[1] 1. Fallow *(Cervus dama),* 2. Red *(Cervus elaphus);* 3. Sambar *(Cervus unicolor)*	Not declared. Defined as protected wildlife under the Wildlife Act 1975.
Common (Indian) Myna *(Acridotheres tristis)*	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/wikipedia/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

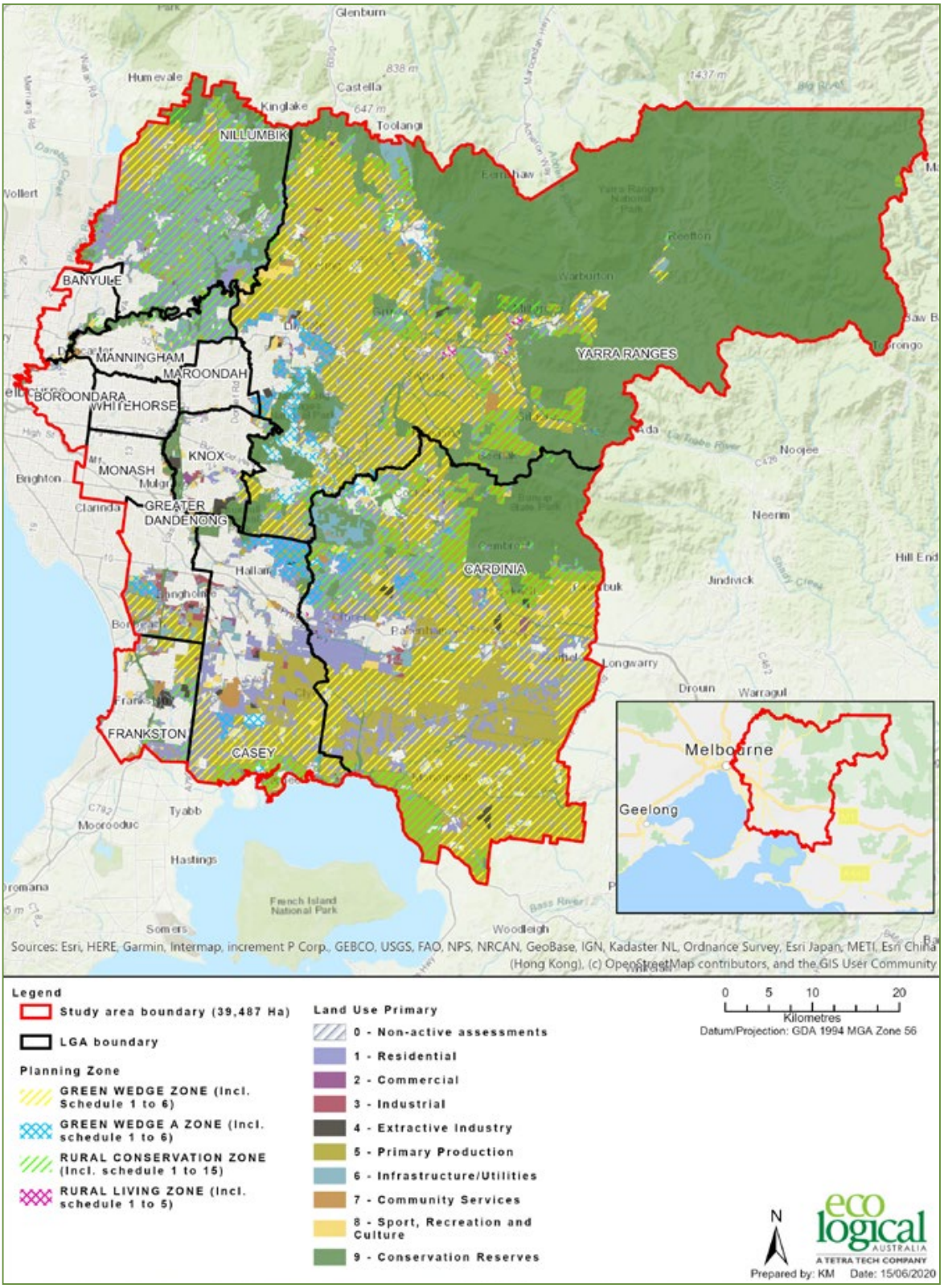


Figure 1. Study area

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.

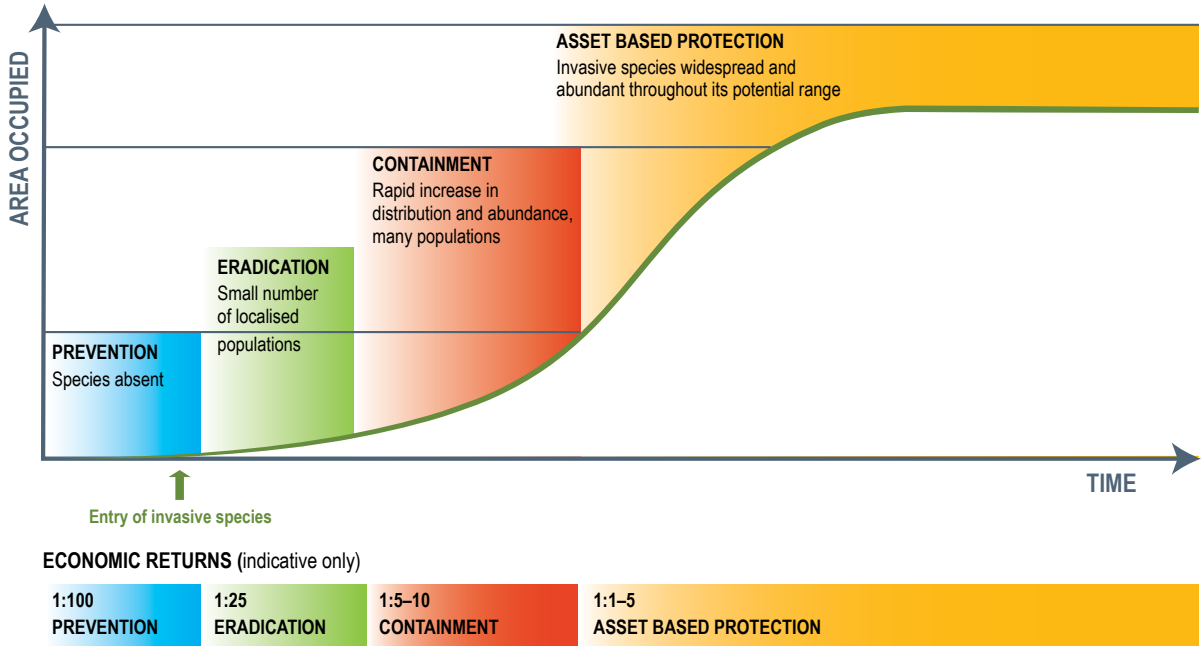


Figure 3. The 'Invasion Curve' Source: Victorian Invasive Plant and Animal Policy Framework (Agriculture Victoria)

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.

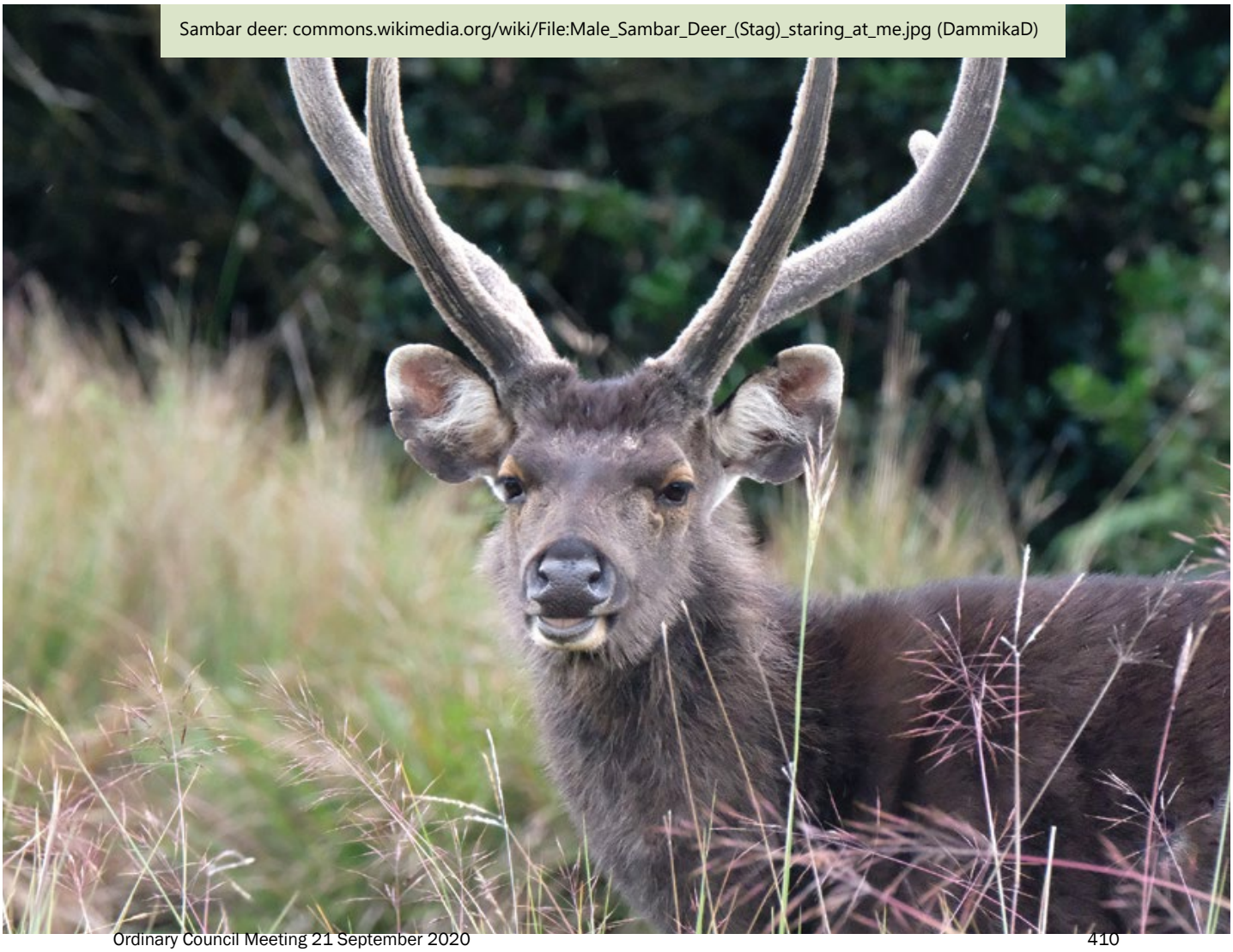
2.4 Regional Collaboration

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 (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, Grarock 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 *(Isoodon 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/wikipedia/commons/a/a5/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.

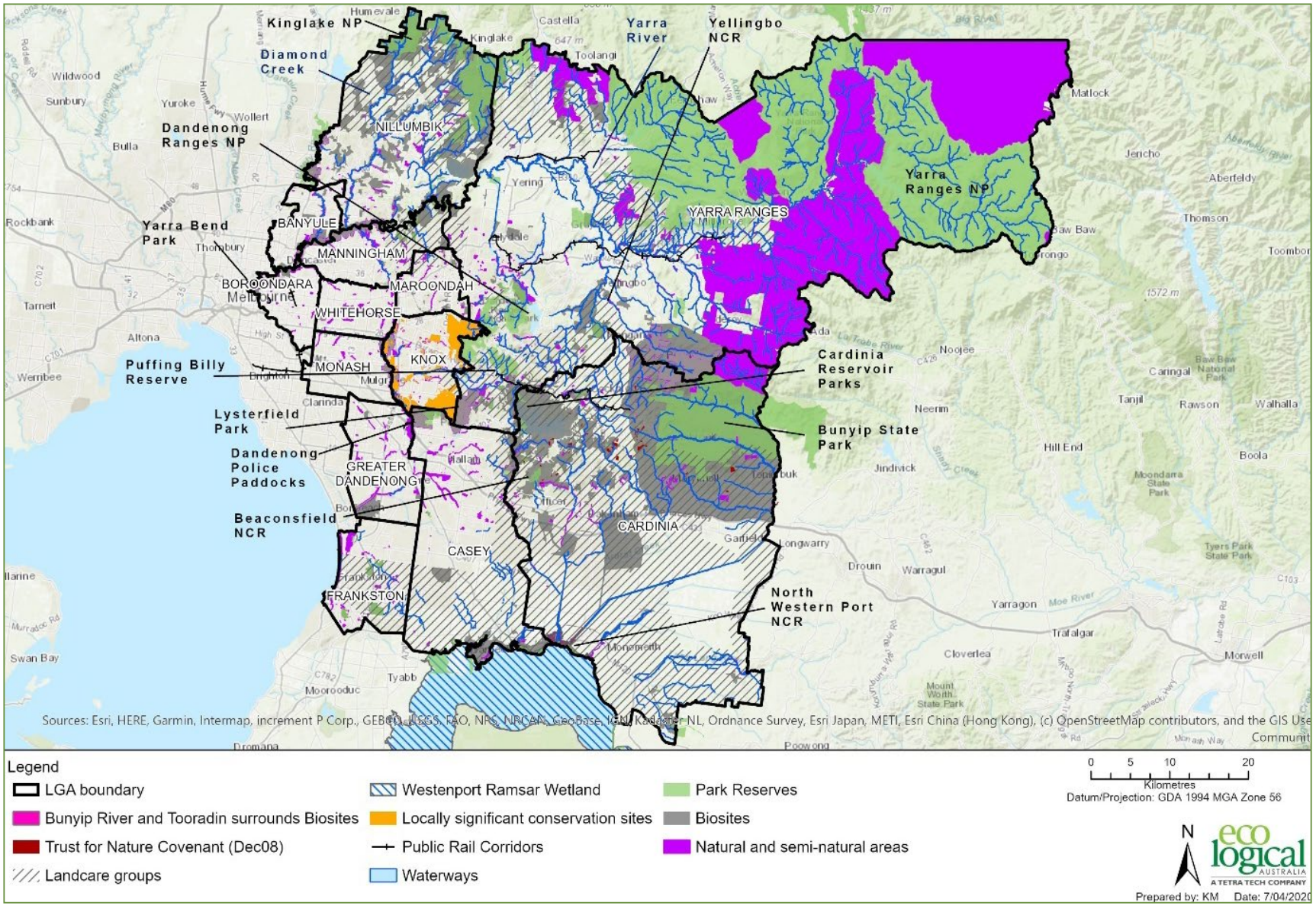
This Strategy is focused on site-based outcomes. Figure 4 shows key regional natural assets that are valued for conservation and recreation purposes. This baseline map has been derived from multiple, existing sources including local strategic plans, VEAC Open Space, private land conservation covenants, 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



Regional Assets

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

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.

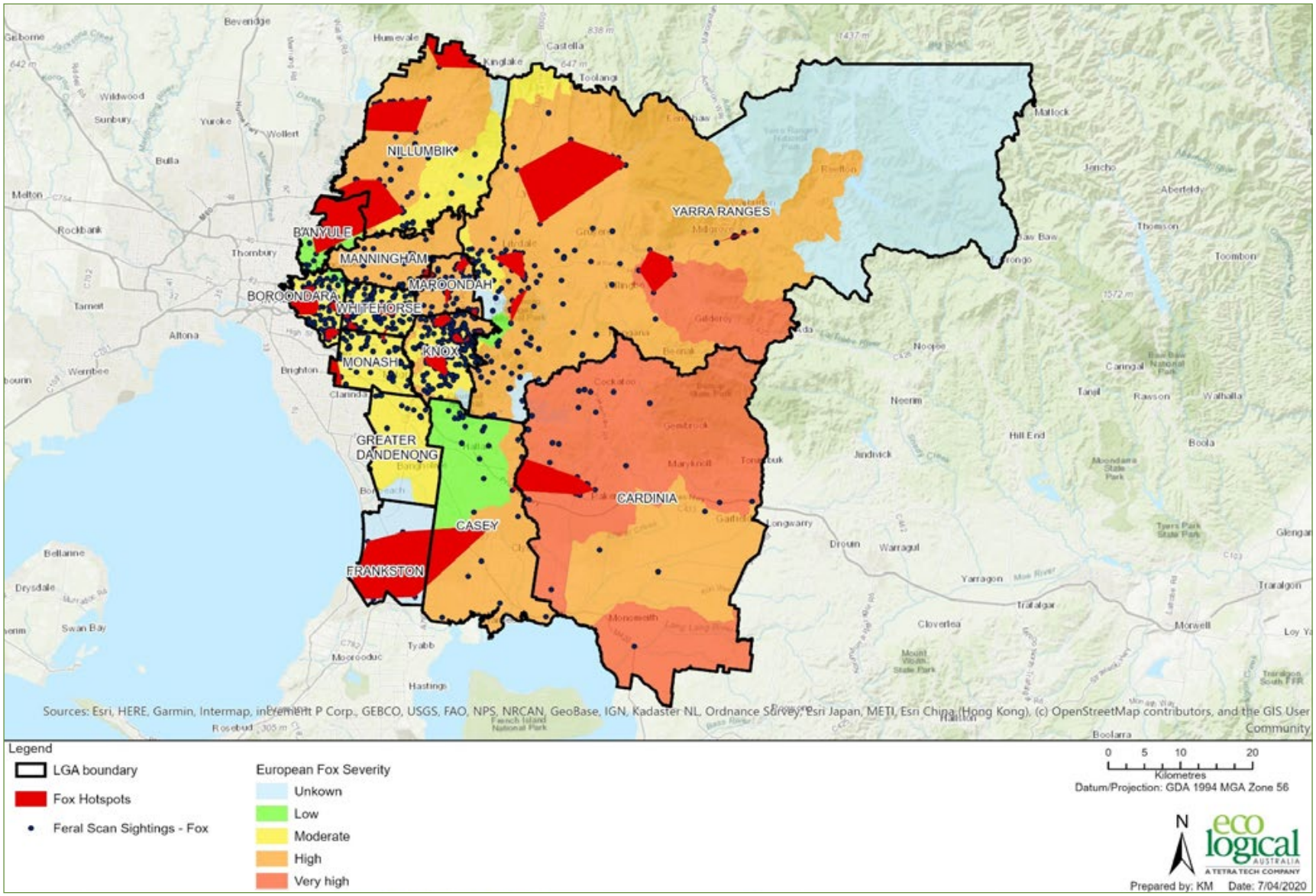


Figure 5. European Fox Threat

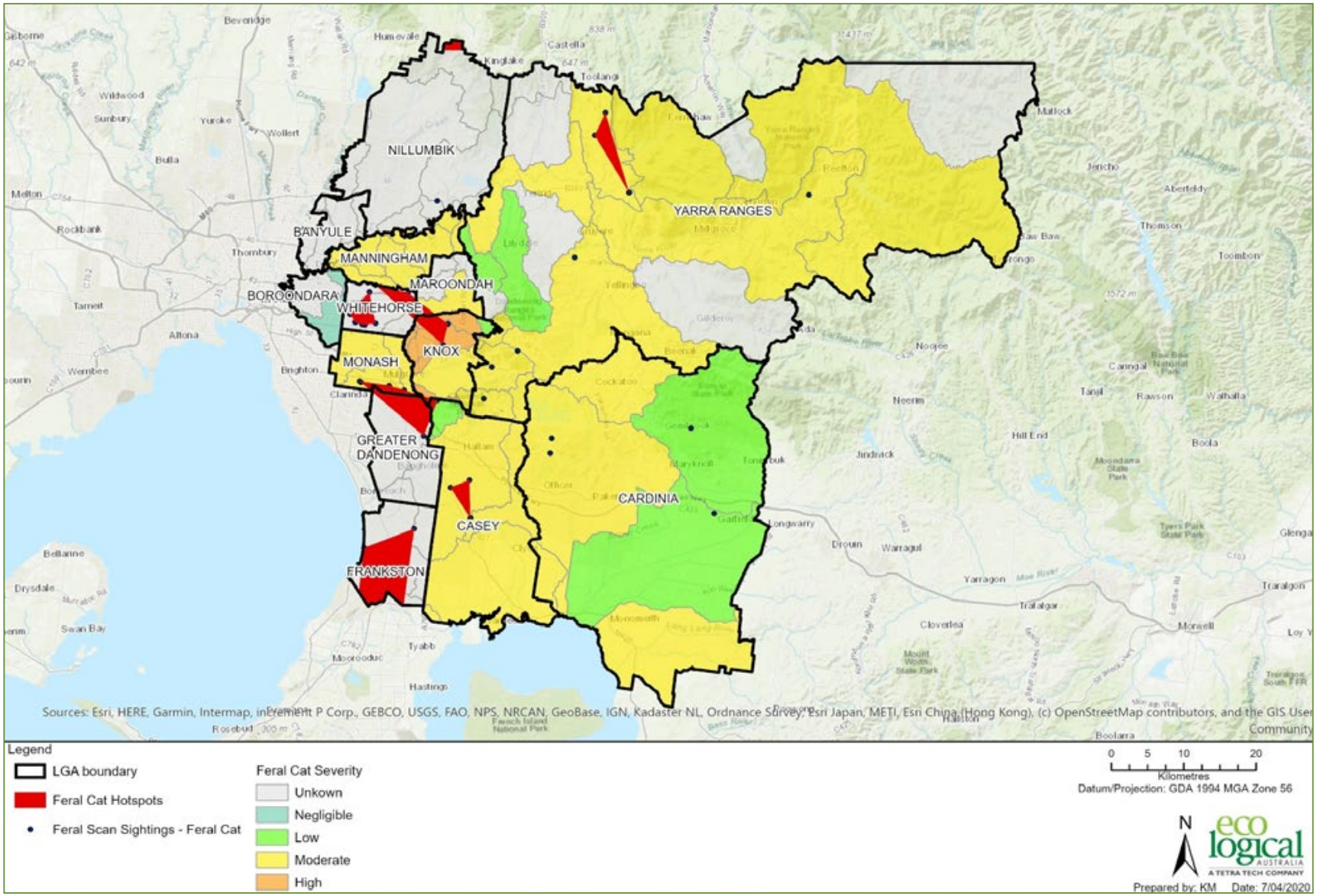


Figure 6. Feral Cat Threat

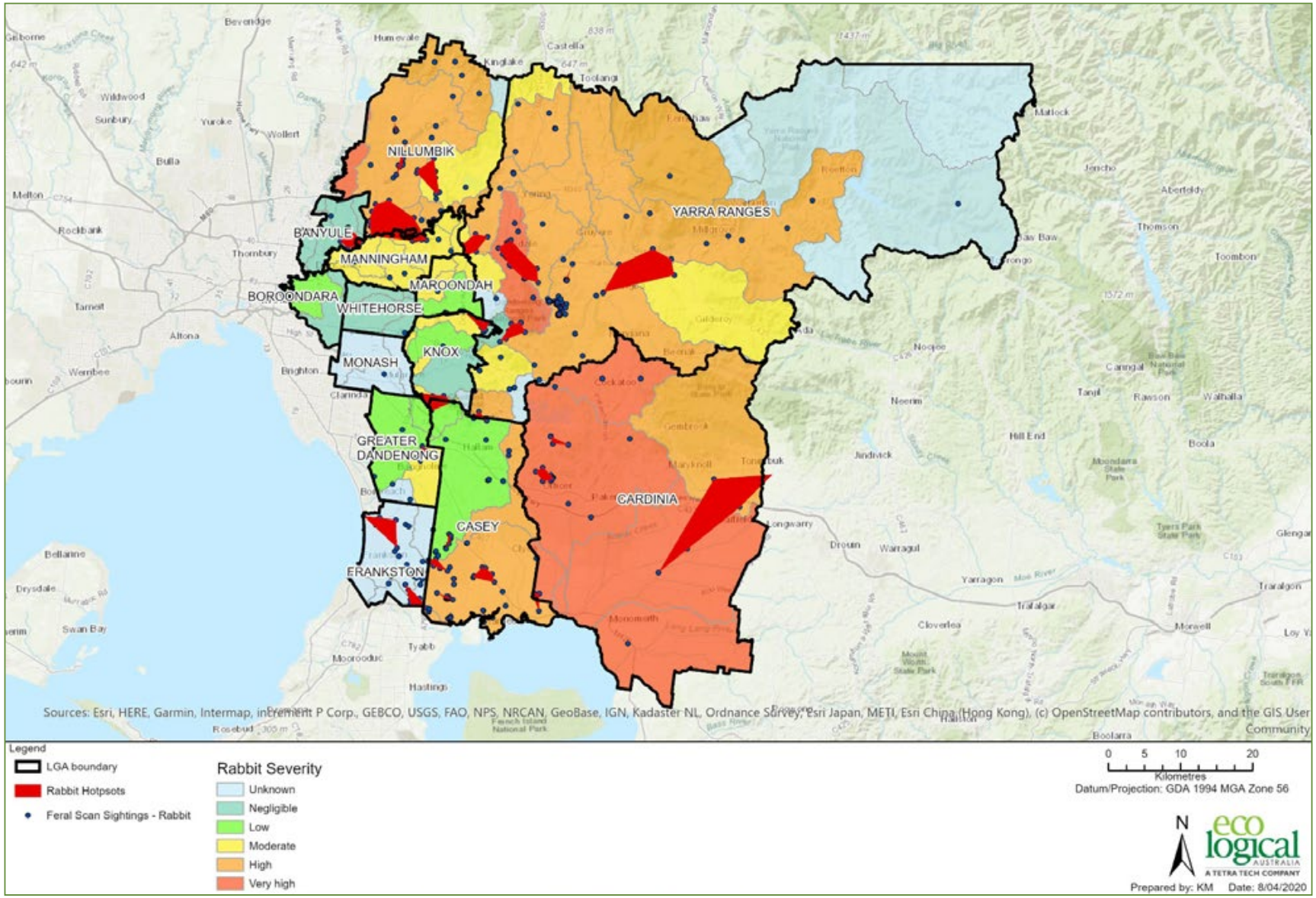


Figure 7. European Rabbit Threat

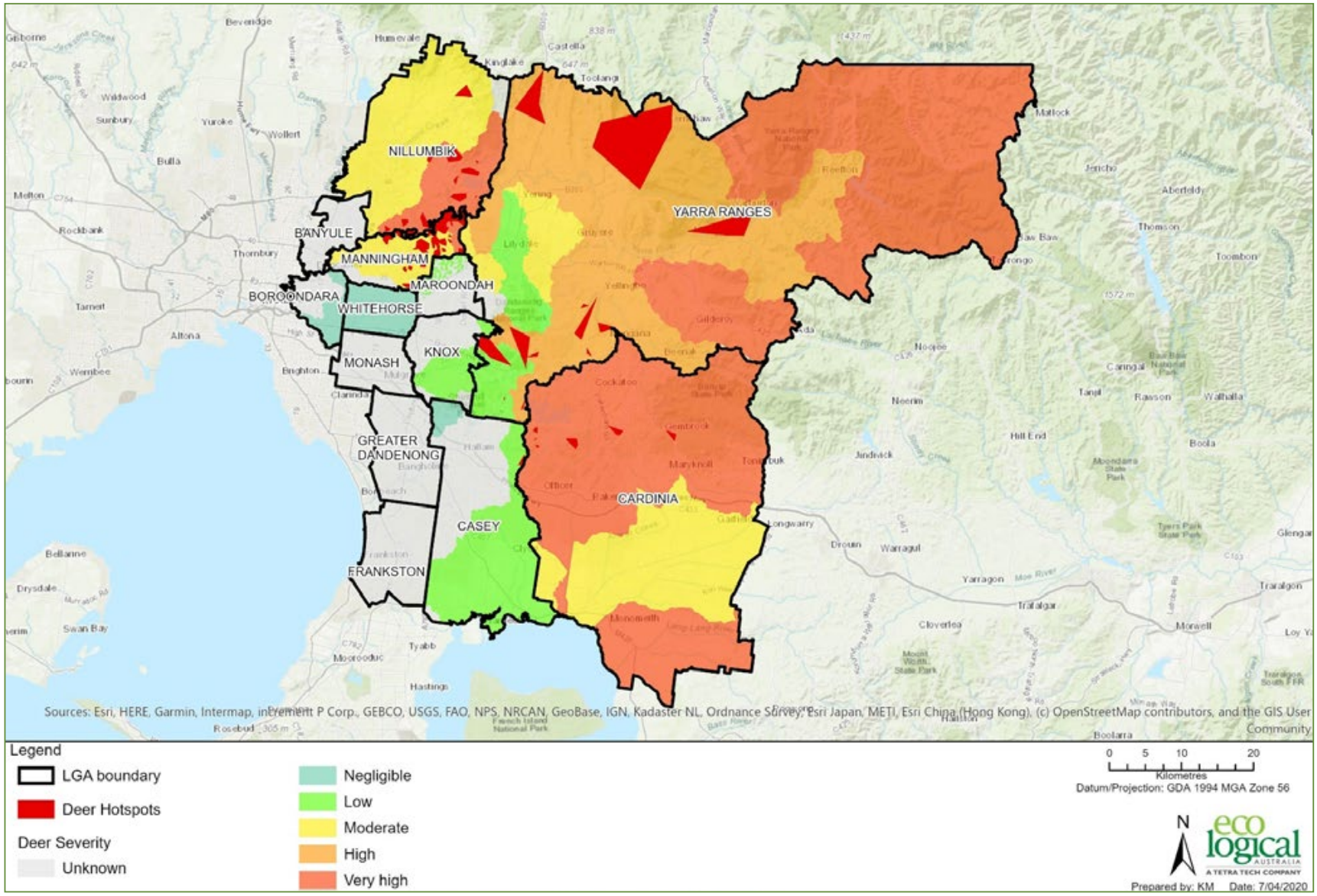


Figure 8. Deer Threat

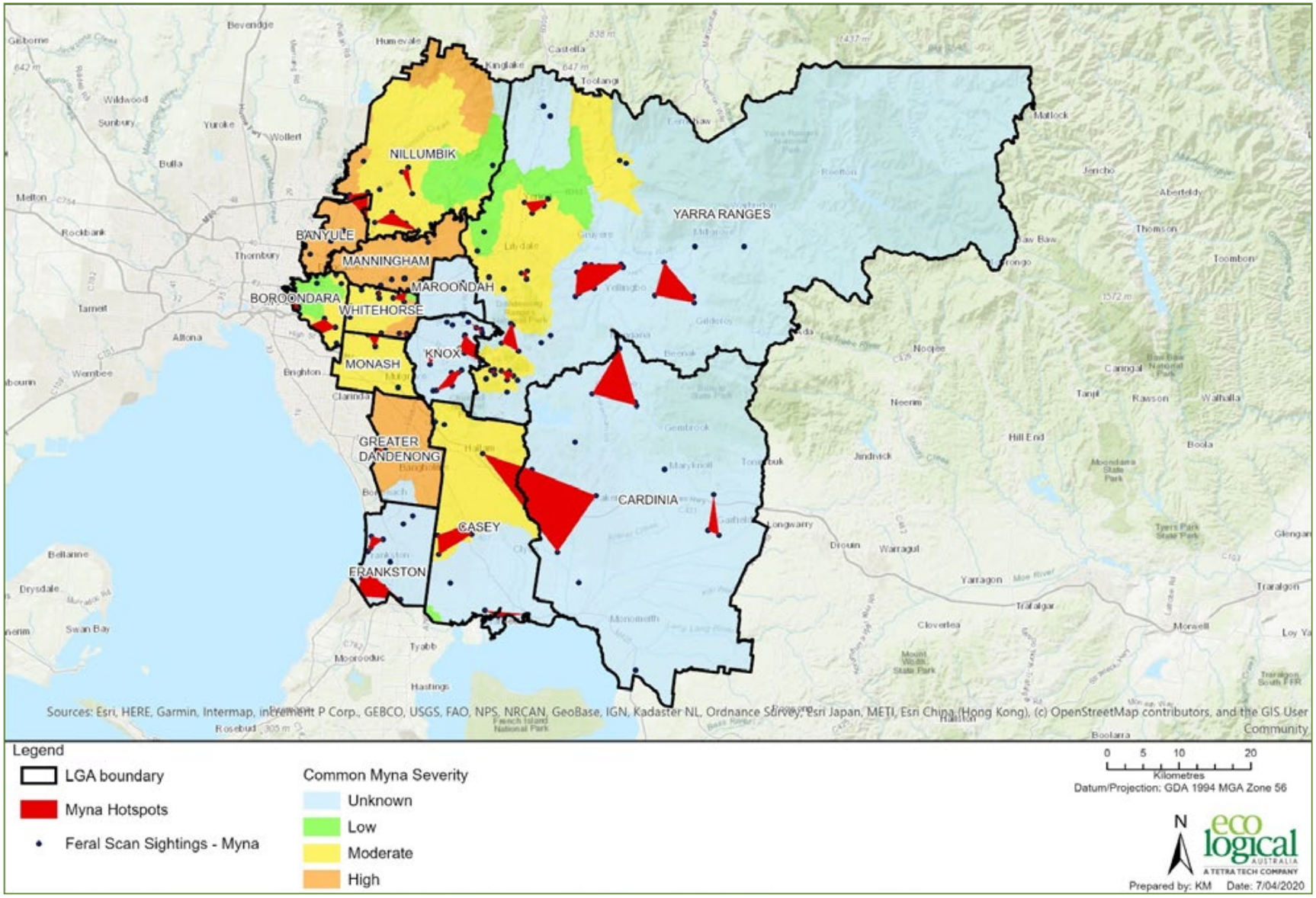


Figure 9. Common (Indian) Myna Threat

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 20km2 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. Ferreting. 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 Ferreting. 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.

Sambar deer: commons.wikimedia.org/wiki/File:Sambar_Deer_@Satpura_Tiger_Reserve.jpg (BSSKrishnaS)

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 Founds' 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 the 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 though 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.

Goal 1

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

Objectives

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.

Goal 2

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

Objectives

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.

Goal 3

Mitigate the impact of established priority pest animals on biodiversity, primary industry (e.g. agriculture) and social well-being.

Objectives

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.

Goal 4

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

Objectives

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
Action 1.2.2 Develop a regional guide on humane pest animal control options and disposal of carcasses. Educate public on ethics of humane control and euthanasia to encourage landowners to actively participate in control programs. Links to Action 2.1.1	1) Safe and legal use of toxins, traps and firearms. 2) Responsible and safe disposal of animal carcasses.	All	Lead: Network DELWP Ag Vic Landholders	DELWP Ag Vic Pest Smart	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.							
Action 1.3.1 Facilitate partnership models that involve community, government and industry pest stakeholders. Programs should be community-led and supported by state and local government agencies.	Increased regional capacity for pest management.	N/A	Landcare. Land managers. Lead: Network committee Other: industry, DELWP, Ag Vic, ARI.	Network members Industry DELWP, Ag Vic Landcare. Land managers.	Medium priority/ ongoing	Existing relationship are maintained and enhanced where necessary. New partnerships established where gaps in programs exist.	There are current strong network partnerships in place. New partnerships should aim to improve integrated management across the region and may include the addition of Ag Vic to the Network.

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 program3 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, comprehen-sive 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
Action 2.3.2 Use social and traditional media to promote local and regional pest management approaches.	1) Delivery of positive local implementation of best practice enhanced and maintained, using the most appropriate method/s. 2) Community's general understanding of the benefits of a cooperative approach to pest management broadened.	All	Lead: Network members Other: Ag Vic, CISS	Existing council media networks. CISS DELWP, Ag Vic	Medium priority/ ongoing	Media Monitors summaries/ metric (e.g. number of social media posts, e-newsletters delivered). New technologies engaged. Social media hits, webpage visits	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. There is a need to understand the broader demographic of all stakeholders and target methods to a specific audience.
Action 2.3.3 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.	1) Techniques and tools used by land managers and landholders to manage priority pest animals in a safe, efficient and humane manner. 2) Landholder and land manger capacity increased to through the provision of advice and in-kind support. 3) Identify and provide a list of licensed shooters to all Network members.	All	Lead: Network members Other: Ag Vic, CISS	CISS DELWP, Ag Vic Industry	High priority/ ongoing	Number of meetings, field days and demonstrations provided to landholders (annual). Number of stakeholders trained and effectiveness of transfer of training to pest animal management practices. Before/after participant questionnaires.	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. Field days, demonstrations may be mechanisms useD.

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

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.	Recommen-dations of independent review adopted by stakeholders where appropriate		Lead: Network committee.	Network members, Ag Vic, CISS.	Medium priority/after 6 years.	Recommen-dations are implemen-ted.	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	Analysis and reporting of collated data on the impacts of priority pest animals. Improved regional understanding of pest animal management which guides investment based on analysis Informed stakeholder network.		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

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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

Eastern Region
Pest Animal Strategy
2020-2030
Volume 2 Supplementary Information

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

Document Tracking

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Appendix A
Pest Species Profile

A1 Common Issues

Increasing Urbanisation and Peri-urban Development

- Urbanisation continues to affect biodiversity in the region principally through the spread of exotic species, pollution and increased predation by domestic cats and dogs on native fauna and the fragmentation of local, natural habitat.
- The changing social demographic associated with urban and peri-urban expansion has also impacted the ability of rural/residential communities to manage pest animal issues collaboratively due to high rates of absentee landholders, reduced understanding of the issues and reduced involvement with traditional rural/ community networks engaged in such activities.

- A survey found that most (96%) Victorians regarded feral cats as pests, but did not see domestic cats the same way, with only 34% regarding them as pests (Johnston & Marks 1997)

Animal Welfare and Environmental Impact of Pest Animal Management

- There has been an increasing scrutiny of pest animal management welfare related issues (http://www.pestsmart.org.au/animal-welfare/attitudes-to-animal-welfare/) and is further facilitated by accessible and timely communication technologies, particularly smart phones, increasing peri-urban populations and changing social and community attitudes. There is an expectation that animal suffering associated with pest animal management be minimised, this is particularly so for species for which sectors of the community have a special affinity or attachment, for example wild horses and deer.
- The Network support methods to control or manage pest animals that are humane, target specific and have minimal unintended environmental impact.
- Operating procedures in this strategy are informed by the Australian Animal Welfare Strategy (AAWS) to ensure the humane treatment of all animals in Australia and the relative humaneness of a range of pest animal control methods.
- This strategy uses existing Model Codes of Practice (CoPs) and Standard Operating Procedures (SOPs) have been developed for a range of pest animal species as guidance to jurisdictions and their management of animal welfare aspects of pest animal control.
- The SOPs are guiding documents only and can be modified by jurisdictions to suit their particular needs and legislation. The CoPs have been endorsed by the National Biosecurity Committee and remain as guiding documents.
- CoPs encompass all aspects of controlling a pest animal species. A CoP for a pest animal species provides general information on best practice management, control strategies, species biology and impact, and the humaneness of current control methods.

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

A2 European Fox

Pest Status VIC

Declared Established pest animal in Victoria under the CaLP Act. Predation of native animals by the introduced European Fox Vulpes vulpes is listed as key threatening processes under the Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act) and Flora and Fauna Guarantee (FFG) Act (1998). Fox considered a threat to 14 species of birds, 48 mammals, 12 reptiles and two amphibians, with the orange-bellied parrot, spotted quail-thrush (from Mt Lofty Ranges), herald petrel, Gilbert's potoroo and western swamp tortoise listed as critically endangered[1]. Foxes are also likely to predate shorebirds and migratory shorebirds, with the extent of impact currently unknown in the Eastern Region. The national economic impact of foxes is estimated to be $227.5 million annually. This includes $17.5 million in sheep production losses, $190 million in environmental impacts, $16 million in management costs and $4 million in research costs[2].

As a declared established pest species, foxes may not be eradicated however populations of foxes may be controlled for asset protection. Agriculture Victoria administrate the Victorian Fox and Wild dog Bounty for eligible hunters, subject to terms and conditions. Eligible hunters may receive $10 per head for each fox killed.

1 http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/pest-animals/a-z-of-pest-animals/red-fox
2 http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/pest-animals/a-z-of-pest-animals/red-fox

Biology

Foxes are medium sized, carnivorous mammals. They live up to nine years. Foxes reach sexual maturity within 12 months of age, mating occurs in winter (June-October) and gestation lasts between 51 to 53 days. Litter size averages three to six pups and up to 12 with cubs being born in spring (DPI 2019). Young usually appear from the den in late spring and at 10 -12 weeks will leave the den, by six months cubs are independent and dispersal of young is typically within 30 kms from the den site (DPI 2019).

Foxes are generalist predators and have been found to consume at least half of the threatened fauna listed under the EPBC Act (1999) (Reddiex & Forsyth 2004).

Foxes are nocturnal hunters and during times of food abundance, such as spring, cache excess food and recover resources when prey is scarce, for example during winter (DPI 2019). Foxes are typically solitary. During the breeding cycle, dog (male) and vixen (female) foxes will form a family group prior to breeding and sometimes subordinate litter mates may remain in the natal home range as helpers.[3]

3 https://www.dpi.nsw.gov.au/biosecurity/vertebrate-pests/pest-animals-in-nsw/foxes/fox-biology

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

Resource distribution is thought to dictate home range and social organisation of foxes in Australia. Home range size varies 10-300km^2. In resource rich areas carrying capacity is high and a family group of six to seven individuals can occupy a shared range of 3-5km^2 (Saunders, Gentle & Dickman 2010). Range size varies with the type of habitat, population density of foxes and availability of food.

Distribution

Fox populations are widely established in urban, suburban, agricultural and natural environments throughout the Eastern Melbourne region. Foxes inhabit many urban areas, especially where there is cover provided by parklands and reserves and food is easy to find. The densities of foxes residing in cities (3-16 per sq km) can be considerably higher than densities observed in farmland in central Victoria (4 per sq km).

Outside urban areas, the fox is probably most abundant in fragmented agricultural landscapes that provide a range of habitats, food and cover. Estimates of fox abundance are hampered by its nocturnal and cryptic behaviour. In addition, foxes will fill the landscape to a density determined by the availability of food and suitable habitat. Habitat suitability is usually determined by the densities of prey animals within an area

A large portion of Australia falls within the preferred climatic range for this species and foxes have capacity to spread in the Eastern Melbourne Region (Yarra Council 2012, Saunders, Gentle & Dickman 2010). Human modification of the Australian landscape for farming and development has enabled foxes to spread widely across the landscape through pasture lands and modified patchy landscapes. Foxes exploit abundant food sources including rabbits and native fauna which have not evolved with fox-specific predation avoidance strategies (Saunders, Gentle & Dickman 2010).

Control

Baiting with sodium monofluoroacetate (1080) is considered to be the most cost-effective broadscale option for fox control currently (Saunders, Gentle & Dickman 2010). Other methods of fox control, such as trapping, shooting, and baiting with other poisons, are more labour intensive but are recommended for use concurrently with a bait control program to account for bait shy animals, bait caching and subsequent bait avoidance (Saunders, Gentle & Dickman 2010). Exclusion fencing is also an effective method for fox control, however may not be a suitable control option.

Optimal bait density will vary with fox density, home range size and habitat use (Saunders, Gentle & Dickman 2010). However, for most areas of Australia, 5-10 baits per square km is considered to be the optimum density for reduction of fox populations (Saunders & Mcleod, 2007), at an ideal frequency of four times per year (Moseby & Hill 2011; DPAW, 2014). Aerial baiting is more cost effective for large areas than ground baiting (Fairbridge & Fisher, 2001; Saunders & Mcleod, 2007), due to the lower labour costs and time involved. Techniques to prevent caching are also highly recommended, this includes the use of highly palatable bait types which are as fresh as possible (Saunders, Gentle & Dickman 2010. Pre-baiting and the use of continuous scent trails should not be undertaken, these techniques can lead to bait aversion and increase the chance of caching (Saunders, Gentle & Dickman 2010).

For control to be most effective Saunders, Gentle and Dickman (2010) recommend initial intensive and widespread control measures in order to reduce fox populations, followed by sustained maintenance control to prevent population recovery over time. Buffer zones are also highly recommended in order to prevent immigration of new individuals into the target area. The use of buffer zones in control efforts has been effective in reducing edge effects and more sustained population control due to reduced immigration (Saunders, Gentle & Dickman 2010). Maintenance control may at times require efforts equal to initial control measures and techniques, and an adaptive management approach is recommended to respond to changes in population density over time.

A3 Feral Cat

Pest Status

Declared Established pest animal on specified Crown land in Victoria. Declaration applies to areas of Crown land managed by the Department of Environment, Land, Water and Planning (DELWP), Parks Victoria, Phillip Island Nature Park and the four Alpine Resort Management Boards. The Declaration excludes areas managed under lease or licence or unused roads bordered by private land on both sides. Predation by cats is listed as key threatening processes under the EPBC Act and FFG Act. Approximately 80 endangered and threatened species are at risk from feral cat predation in Australia4. The cost of feral cat management and research has been estimated at $2 million per year nationally. The economic loss inflicted by feral and domestic cats, based on bird predation alone, has been estimated at $144 million annually5.

To protect the welfare of all cats, including the safety of free-roaming domestic cats, feral cat control will only be actively implemented in the specified areas by government and agency staff and their approved agents.

Feral cats have not been declared as a pest animal on private land. Domestic cats are subject to night time curfews in many Council areas in the region by Local Order. All domestic cat owners must register pets and follow responsible pet ownership including to prevent their cat from harming native wildlife (Domestic Animals Act 1994 and the objectives of Victoria's environmental protection laws). It is an offence to destroy a domestic cat, except in very limited circumstances.

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

Biology

Feral cats may live for up to seven years. Female feral cats can reproduce at 10–12 months of age, with males reaching sexual maturity at about one year (Denny and Dickman 2010)[6]. Cats are mostly solitary animals and usually maintain a home range which may be up to 10 sq km for males and less for females. Usually more active at night, with the two periods of greatest activity centred near the times of sunrise and sunset.

Distribution

Feral cats live in a diverse range of habitats including deserts, forests, woodlands and grasslands. Feral cats usually reach their highest densities on small islands or in human-modified habitats such as farms and rubbish tips.

Feral cats are known to have contributed to the extinction of 28 mammal species and are currently listed as the greatest threat to Australia's native mammals (Department of the Environment 2015). Feral cats are distributed throughout all Australian states and territories and many offshore Islands. They have an extremely broad diet consuming a wide range of native wildlife, and as such, are implicated in population declines of a huge number of native fauna species (Dickman et al. 2010; Doherty et al. 2015; Reddiex & Forsyth 2004). Small mammals within the range of 35 grams to 5.5 kilos are at greatest risk of predation by feral cats, birds and reptiles are also common prey (Doherty et al. 2017; Fancourt 2015; Molsher et al. 1999). Within Australia, on average reptiles comprise of 32.7% of feral cat diets, this is a higher proportion that in other countries (Doherty et al. 2015). Rabbits are found to make up a large portion of the diet of feral cats, this is likely due to their high abundance in Australia (Doherty et al. 2017). Feral cats hunt both diurnally and nocturnally and exhibit facultative feeding strategies and will prey switch to other small mammals if rabbit density decreases (Doherty et al. 2017; Molsher et al. 2005; Molsher et al. 1999).

Feral cats usually maintain a home range which may be up to 10 sq km for males and less for females[7]. The wide distribution of feral cats across Australia encompasses every possible habitat type on the continent (Arid Recovery 2019). The success of feral cats in Australia can be attributed to many factors including their opportunistic and generalist prey preferences and generalist habitat preferences, being able to survive without access to water and the presence of a constant domestic source population (Doherty et al. 2017).

Control

In unfenced areas of Crown land where the feral cat declaration applies, it is recommended that control efforts combine both lethal and non-lethal control measures and an adaptive management approach which accounts for localised response of feral cats and native fauna abundance, as well as developing technologies that advance over time. Lethal control options include, baiting with poisoned baits, and, trapping and shooting (Doherty et al. 2017). Non-lethal control options in unfenced areas includes the management of habitat, food supplies and trophic relationships (Doherty 2017).

Baiting is an effective method of controlling feral cats on mainland Australia. Baiting is thought to only be effective when undertaken at a scale in which a large reduction in density is achieved, otherwise rapid immigration will render any efforts futile (Doherty et al. 2017). Recently developed baits found to have enhanced uptake specifically designed for feral cats (Doherty 2017). Of these, Curiosity® has recently been registered by the APVMA and is available by permit issued by Agriculture Victoria to agencies and departments. For optimal results it is suggested that cat baiting programs take place during autumn and early winter when rabbit abundance and reptile activity are at their lowest (Doherty et al. 2017). Baiting

6 https://www.pestsmart.org.au/wp-content/uploads/2010/03/CatReport_web.pdf
7 http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/pest-animals/a-z-of-pest-animals/cat-feral-or-wild

must be postponed in the event of high rainfall events preceding the planed execution of a baiting event. This is because high rainfall can elevate populations of prey species and therefore reduce the chance of bait uptake by cats (Doherty et al. 2017).

An important consideration in the control of feral cats is the predatory control they exert on rabbit numbers in Australia, any cat control must incorporate rabbit control strategies to prevent an increase in rabbits (Molsher et al. 1999).

Methods other than lethal control are especially important considerations for feral cat management given the recurrent inputs required for lethal control of cats (Doherty et al. 2017). Cats are more successful hunters in open landscapes, hunting success rates is affected by the structure of habitat surrounding prey (McGregor et al. 2015). Recent research has shown a 70% success rate for cats hunting in open landscapes, where as in landscapes with dense grass cover or complex rock terrain success fell to 17% (McGregor et al. 2015). Therefore, by maximising grass cover, and complex vegetation stratification and maintaining areas of complex rock terrain across the landscape predation rates and the abundance of feral cats could be reduced locally (McGregor et al. 2015).

A4 European Rabbit

Pest Status VIC

Declared Established pest animal in Victoria. Competition and land degradation by rabbits is listed as key threatening processes under the EPBC Act and FFG Act. Rabbits selectively feed on certain species of plants at critical stages of development such as seeding and seedling establishment. Rabbits can severely impact the regeneration or recruitment of critical vegetation communities[8]. In some instances, the impact created by rabbits on vegetation is often replaced with noxious and/or unpalatable weed species.

In 2009 the national impact of rabbits through lost agricultural production was estimated at $206 million per annum. In combined data for Tasmania and Victoria rabbits are estimated to have cost approximately $30 million in lost production for the beef, lamb and wool industries per year[9].

Biology

Rabbits are adapted to a wide range of habitats, preferring short grassy areas for feeding. Both males and females reach sexual maturity at three to four months of age. Under favourable conditions an adult female can produce seven or eight litters in a year. One doe can produce between 50–60 offspring in a single breeding season. Rabbits live up to ten years.

Breeding season is determined by rainfall and plant growth, and as such can be variable, but generally occurs during spring (DPI 2019). It must be noted though, rabbits can breed at any time during the year

8 http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/pest-animals/a-z-of-pest-animals/european-rabbit
9 http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/pest-animals/a-z-of-pest-animals/european-rabbit

provided suitable high protein plants are present within their range (DPI 2019). Juveniles rarely disperse more than 200 meters from the warren or squat (DPI 2019; Williams et al. 1995).

Rabbits generally emerge from shelter one to three hours prior to sunset and forage and socialise from evening until early morning before returning to shelter sites throughout the day (DPI 2019; Williams et al. 1995). Nightly activity is reduced under unfavourable conditions including rain and high wind, activity is also reduced during breeding season (DPI 2019).

As rabbits don't frequently dig new warrens, many rabbits live and breed in shallow soil depressions under fallen timber or within tall and dense vegetation, new depressions are dug with each litter and squats develop into more complex burrow systems over family generations (Williams et al. 1995). In Woodland or open shrubland areas, squats are more frequently used than warrens (Williams et al. 1995). Rabbits may also utilise surface shelter including dense scrub, timber logs and rocks and in landscapes where rabbits are found to be sheltering above ground warren ripping will not be a suitable control method (Williams et al. 1995).

Distribution

European rabbits occur throughout Victoria except in alpine and closed forest environments. They are widespread across the Eastern Region. Rabbit density fluctuates in response to rainfall, and during times of drought can decline to around 1% of their potential peak population, rabbit numbers are found to be at their peak during early summer (Williams et al 1995).

Control

Evidence suggests that rabbit management is most successful when multiple control techniques are implemented and when sustained on the same geographic area over several years. Research also indicates successful reduction in pest rabbit impacts are improved when control actions are coordinated across landholders and integrated at state, regional and local scales (ERPN workshop 8th October 2019, Williams et al 1995).

Strategic rabbit control entails monitoring and evaluating the efficiency of the onground actions (Williams et al. 1995). Monitoring is a prerequisite for projects.

Control techniques and efforts are determined by current rabbit distribution, abundance and landscape features including topography and soil type (Williams et al. 1995). In public open space with warren activity, local experience in the Eastern Region has reported successful warren control by jamming entranceways with fallen tree material obtained on site, in addition to mechanical destruction methods. Warren jamming is cost effective and has less visual impact and is suited to use in combination with fumigation and biological control.

Under high rabbit densities and if the use of warrens is confirmed within the study area, initial poisoning (primary control) followed by warren ripping or fumigation (sustained maintenance control) is recommended. Dogs have been used successfully to drive rabbits underground into warrens to increase the effectiveness of efforts (Williams et al. 1995). Fumigation is generally thought unsuitable for large areas as it is high cost and labour-intensive but could be implemented across smaller target areas where rabbits are a localised problem, or where a particular threatened species is present. In situations where rabbit density is low the suggested sustained maintenance control techniques should alone be effective in reducing and maintaining low rabbit densities (Williams et al. 1995).

Any rabbit control in Australia must incorporate feral cat and European Fox control in order to reduce prey switching by feral cats and foxes to native critical weight range mammals under reduced rabbit densities (Doherty et al. 2017; Molsher et al. 1999; Williams et al. 1995). Any localised reduction of rabbits will more than likely result in prey switching by feral cats and foxes and increase predation pressure on native fauna (Doherty et al. 2015; Williams et al. 1995).

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

A5 Feral Deer

Pest Status VIC

Not declared. Defined as protected wildlife under the Wildlife Act 1975. Defined as game, which means they can be hunted by licensed game hunters. Under the Wildlife (Game) Regulations 2012 (S.R. No. 99/2012). The three target deer species are known to have viable feral populations established in Victoria: Red, Sambar and Fallow.

Impacts from feral deer populations include altered composition and structure of native vegetation communities, weed/disease spread, grazing pressure (competition for native and domestic stock), soil erosion, degraded water quality, traffic accidents, stock spooked/mauled, pathway creation for other feral species incursion into forested areas. Deer are associated with rubbing and ring barking trees which is problematic in areas with high density populations.

Biology

Deer are herd animals. They reach sexual maturity at 16 months, with mating/fawning season varying by species and their population can increase by 30% to 55% per year (Hone et al 2010). Deer are adaptable mixed feeders[2]. They commonly eat leaves, bark and fruit and prefer grassy forests in undulating country.

Distribution

Deer populations are distributed across Victoria. The population of sambar is the most widespread and thought to be in the hundreds of thousands. Their range is spreading to cover most of the forests of the Central Highlands and Gippsland and sambar are now found in Wilsons Promontory National Park, joining the park's large hog deer population. Hog deer populations are concentrated in coastal areas of eastern Victoria. Red deer are in high numbers in the Grampians with smaller outlying populations. Fallow deer are found in large numbers in the Otways and the forests adjacent to South Australia, while Chital and Rusa deer are yet to establish significant populations.

In the Eastern Region, deer are present in Cardinia, Yarra Ranges, Nillumbik, Manningham and are an emerging pest management issue in adjacent areas including Knox, Maroondah and Casey. Deer strike is reported to be increasing in parts of the region, posing a safety concern on roads. 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 also present in drinking water catchments with particular concerns for Upper Yarra, Sugarloaf and Cardinia Resevoir areas.

Deer are herbivores and primarily forage on grasses, herbs, and leaves (from shrubs and trees), as well as bark and some fruits (DSEWPC 2011). Deer can be found in herds of up to 30 individuals but are also known to live as individuals without a herd (DSEWPC 2011). Mating occurs in Autumn and gestation is usually eight to nine months, most frequently single young is born (DSEWPC 2011). Males are known to rub against trees and saplings in order to mark out territories (DSEWPC 2011). The known habitat preferences for the three deer species are presented in Table 1.

Deer Species	Grasslands	Woodlands	Forest	Rainforest
Red deer *Cervus elephus*			Preference for open grassy glades within forest	
Sambar deer *Cervus unicolor*			Coastal to alpine	
Fallow deer *Dama dama*	Preference for woodland opening onto grassland	Preference for woodland opening onto grassland		

Table 1: Habitat preferences for three of Australia's Feral Deer species present in the Eastern Region (Gynther & Baker 2013)

Where they are abundant deer have negative effects on overall ecosystem biodiversity and to plant abundance and diversity. Deer suppress seedling recruitment and sapling growth through foraging and rubbing against saplings to mark out territories. Deer compete with native animals through grazing competition and contribute to soil erosion and water degradation in creeks and rivers by trampling these areas with their hard hooves (DPI 2019; DSEWPC 2011). Deer are also known to spread weeds and carry disease which can be spread to other animals (DSEWPC 2011). Combined, these effects alter the structure and composition of native ecological communities (McLeod 2009).

Control

The negative impacts associated with feral deer in Australia have only recently been acknowledged by Government departments in Australia. With the first documentation of potential damage by feral deer being noted in 1989 by Groves and Bishop (McLeod 2009). More recently however, government opinions on environmental damage as a result of feral deer populations have changed, and in 2001 the Australia State of the Environment Report discuss deer as having had. or having potential to, cause severe environmental damage in Australia (McLeod 2009). The main control method is shooting undertaken by professional contract shooters and accredited volunteer hunters. Aerial shooting has also started recently being used in Victoria where it can be effective in areas with low bush cover.

A6 Common (Indian) Myna

Pest Status VIC

Not a declared pest animal in Victoria. The impacts of Common (Indian) Myna include damage to horticultural crops; disease spread; displacement or predation of native fauna; dispersal of invasive plants; reduced biodiversity; damage to public amenities via fouling or nesting; and public disturbance caused by fouling, noise, communal roosting and scavenging. Exotic pest birds are currently estimated to cause $8.5 million in annual loss to Australian primary industries. Crops affected include, wheat, oats, barley, grapes, cherries, blueberries, apples, stone fruits and olives. The Myna adversely impacts regent parrot, little tern, hooded plover, flesh footed shearwater, white tern and sooty tern via competition for nest hollows, predation of eggs or direct attack

Biology

Closely associated with human habitation. In the evening, large groups of Common Mynas gather in communal roosts, mainly in the non-breeding season, in roof voids, bridges, and large trees, and numbers can reach up to several thousands. Common Mynas mate for life. During the breeding season there is usually considerable competition for nesting sites. Favoured locations are in the walls and ceilings of buildings, making these birds a nuisance to humans. Nests are also placed in tree hollows, which are used by native birds. Nests are quite messy and consist of a variety of materials. Leaves, grasses, feathers and assorted items of rubbish are common materials.

Distribution

Myna's are distributed across the Eastern Region, predominately near towns and cities.

Expert opinion suggests where not constrained by low temperature (Martin 1996), this omnivorous species will continue to spread into rural and urban areas across Victoria. While commonly regarded as commensal with humans, the species is nevertheless found in reserves and less disturbed environments in Australia and other parts of the world (Pell and Tidemann 1997, Peacock et al 2007)

The Common (Indian) Myna also known as Common Myna was introduced across Eastern Australia in the 1800's for the biological control of crop insects. The Common (Indian) Myna is now a common and wide spread pest species (Pest Smart 2014). Across their current range in Eastern Australia (Figure 2) Common (Indian) Mynas cause severe damage to vegetation as well as compete aggressively with native species for habitat and resources (Pest Smart 2014).

Common (Indian) Mynas are highly adaptable in their foraging and food preferences, they can exploit seasonal food abundance and are generalist, opportunistic omnivores (DAF 2016). Common (Indian) Mynas forage singly, in pairs or in flocks either on the ground or within flowering trees and smaller bushes (DAF 2016). There current range in Australia is restricted by temperature and they are not established in areas where the average minimum temperature of the coldest month is less than -0.4 degrees Celsius (DAF 2016). Common (Indian) Mynas evolved in open woodland habitats, and in Australia prefer open habitats (DAF 2016). This species thrives in disturbed areas and human modified landscapes such as urban areas. Across their range in Australia Common (Indian) Mynas are not found in dense or closed habitats such as rainforests (DAF 20016

Control

Current control techniques include shooting as well as trapping and humane euthanasia. Trapping efforts have been found to be more successful at smaller localised scales within broader target areas as opposed to programs which focus on larger broad scale control efforts (Centre for Invasive Species Solutions 2014). Common (Indian) Myna birds can develop trap shy behaviour and are known to avoid areas in which shooting control has been undertaken (Centre for Invasive Species Solutions 2014). Trap success can be improved by utilising decoy birds, nest box trapping and roost trapping (Centre for Invasive Species Solutions 2014). The Centre for Invasive Species Solutions (2014) suggests culls of at least 25 individuals per km2 each year prior to and during breeding season which extends from August to March. Common (Indian) Myna populations can recover rapidly from control programs, therefore repeating control efforts each year is highly recommended for the most effective and sustained control efforts. This species can spread and establish large populations rapidly and once it is established in an area total eradication is unlikely. Therefore, the best management approach would be to respond to distribution spread rapidly to prevent population growth in new areas (Centre for Invasive Species Solutions 2014).

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Appendix B
Legislative Context

The Australian Government Department of the Environment and Energy identify 21 key threatening processes which are listed in the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). These can be identified as threatening processes which may threaten the survival, abundance or evolution of a native species or ecological community (DEE 1999). Key threatening processes relevant to this control plan include;

- Competition and land degradation by rabbits;
- Predation by European Fox; and,
- Predation by feral cats.

In accordance with section 10 of the Victorian government *Flora and Fauna Guarantee Act 1988*, the following Potentially Threatening Processes relevant to this control plan include;

- Predation of native wildlife by the cat, *felis catus*
- Predation of native wildlife by the introduced European Fox *Vulpes Vulpes*
- Reduction in biodiversity of native vegetation by Sambar *Cervus unicolor*
- Reduction in biomass and biodiversity of native vegetation through grazing by the Rabbit *Oryctolagus cuniculus*

The *Catchment and Land Protection Act 1994* (CaLP Act) is the primary legislation in Victoria defining pest animal management obligations. Under the CaLP Act (1994) all land owners have a legal obligation to manage pest animals on their land. Knox City Council has committed to controlling pest species across the Melbourne eastern region. The five species identified for control are rabbits, European Fox, feral cats, deer and Indian Myna. The principle objective of a feral animal control program should be to reduce the abundance and occupancy of feral animal populations within the landscape, regardless of tenure.

To be successful, a pest control program across the entire Melbourne Eastern Region will require cooperation and coordination between the different land managers to ensure that control actions can be completed without interruptions and uniformly across the broader area. A coordinated approach will prevent patches of feral species being left uncontrolled which can lead to rapid recolonization and population recovery of target pest species.

European rabbit: commons.wikimedia.org/wikipedia/commons/a/a5/Oryctolagus_cuniculus_Helsinki.jpg

Planning Document	Summary of Obligations
National Obligations	
Australian Pest Animal Strategy (2017-2027)	Presents three national goals: • Prevent the establishment of new pest animal species • Minimise the impact of established pest animals • Improve leadership and coordination for the management of pest animals
Invasive Animals Cooperative Research Centre	Deliver ethical invasive species solutions in Australia. Current projects and areas of research include; • Rabbit biological control agents • Genetic technologies for pest animal control • Assessment of effects of exclusion fencing (WA & QLD) • Preparing for reset Landscape-scale Predator Management • Management of wild dog and deer in peri-urban landscapes: strategies for safe communities • The role of wild deer in the transition of diseases of livestock • Cost effective management of wild deer • Tools for developing cost effective decisions for managing invasive pest eradications • Real time EDNA tools to improve early detection and response approaches for high risk pest animals • Development of integrated passive and active surveillance tools and networks • Understanding and intervening in illegal trade in non-native species • Development of a national incursion management framework for invasive species – stage 1 • Wild dog alert • Intellitraps • PAPP-Based Lethal trap device (LTD) • Blue healer glovebox antidote • Feral deer aggregator • Hoggone Australia • Mt Hope Malleefowl recovery • Gonacon product registration • Carbon monoxide rabbit warren fumigator
Australian Animal welfare Strategy (2004)	Vision: All Australians value animals and are committed to improving their welfare. Mission: To deliver sustainable improvements in the welfare of all animals.

Victorian Obligations	
Invasive Plants and Animals Policy Framework	Presents the overarching Victorian Government approach to the management of existing and potential invasive species within the context of the Whole of Government Biosecurity Strategy for Victoria. Operationally, the approach is based on four key elements or intermediate outcomes: prevention, eradication, containment and asset-based protection.
Protecting Victoria's Environment – Biodiversity 2037. Department of Environment, Land, Water and Planning (2017)	The Biodiversity 2037 vision is that Victoria's biodiversity is healthy, valued and actively cared for. A range of systems and tools collect, store and display biodiversity information to support our decision making and measure our contributions to Biodiversity 2037 include: Victorian Biodiversity Atlas (VBA) – for contributing species observations Activity data - recording on-ground biodiversity actions NatureKit - for accessing species and habitat information and decision support tools NaturePrint - for information about decision support tools including modelled biodiversity assets, threats, benefits of actions, and Strategic Management Prospects (SMP).
Catchment and Land Protection Act (Victorian Government, 1994)	The main legislation covering noxious weed and pest animal management in Victoria is the Catchment and Land Protection Act 1994 (CALP Act). Under this Act species of plants and animals can be declared as noxious weeds and pest animals. One of the main objectives of the CaLP Act is to protect primary production, Crown land, the environment and community health from the effects of noxious weeds and pest animals. The CaLP Act defines roles and responsibilities and regulates the management of noxious weeds and pest animals. The Act prohibits the movement and sale of noxious weeds of all categories anywhere in the State and covers weed seeds occurring as contaminants in seed lots, plant products or on vehicles, machinery or animals. The CaLP Act also regulates the importation, keeping, selling and releasing of declared pest animals. Under the CaLP Act all land owners have legal obligations regarding the management of declared noxious weeds and pest animals on their land. Specifically, land owners must take all reasonable steps to eradicate regionally prohibited weeds, prevent the growth and spread of regionally controlled weeds, and prevent the spread of - and as far as possible eradicate - established pest animals on their land.

Flora and Fauna Guarantee Act (Victorian Government, 1988)	The flora and fauna conservation and management objectives, as outlined under the Flora and Fauna Guarantee Act 1988, are: • to guarantee that all taxa of Victoria's flora and fauna …. can survive, flourish and retain their potential for evolutionary development in the wild • to conserve Victoria's communities of flora and fauna • to manage potentially threatening processes • to ensure that any use of flora or fauna by humans is sustainable • to ensure that the genetic diversity of flora and fauna is maintained • to provide programs of community education in the conservation of flora and fauna • to encourage co-operative management of flora and fauna through, amongst other things, the entering into of land management co-operative agreements under the Conservation, Forests and Lands Act 1987 • of assisting and giving incentives to people, including landholders, to enable flora and fauna to be conserved • to encourage the conserving of flora and fauna through co-operative community endeavours.
Wildlife Act 1975	Deer are protected under Wildlife Act 1975
Domestic Animals Act 1994	Provides for registration and identification schemes, promotion of responsible pet ownership, and development of local laws.
Prevention of Cruelty to Animals Act (Victorian Government, 1986) and POCTA Regulations 2019	The Minister for Agriculture is responsible for this legislation. It is administered by staff in the Biosecurity Division of the department. The Prevention of Cruelty to Animals Act 1986 (POCTA) has five parts: Part 1 outlines its purpose, scope, application and code making powers. Part 2 broadly defines cruelty offences, penalties, rodeo requirements and appointment of inspectors. Part 2A sets out the enforcement powers and responsibilities of inspectors. Part 3 provides provisions concerning use of animals in scientific procedures. Part 3A provides provisions relating to the infringement notices. Part 4 provides for miscellaneous requirements and offences as well as setting out regulation making powers. Part 5 sets out transitional arrangements that are in place. Regulations prescribe kinds of traps, their features, places where they may be used and conditions of use

Meat Industry Act 1993	Harvesting of deer meat is regulated by the Meat Industry Act 1993
Port Phillip and Western Port Invasive Plant and Animal Strategy (2011) (IPA)	Addresses invasive plant and animal management in the Port Phillip and Western Port region. The IPA sets 5 main objectives as well as actions for region-wide IPA management as well as monitoring and reporting systems. The objectives are; • Implement coordinated, cooperative and effective management of invasive plants and animals across the region. • Prevent the introduction and establishment of new high-risk invasive plants and animals. • Eradicate, contain or prevent further spread of established infestations of high-risk invasive plants and animals. • Address the risks of impacts of invasive plants and animals on the priority environmental and agricultural assets. • Improve management of invasive plants and animals through effective monitoring, evaluation and reporting.
Regional Catchment Strategy for the Port Phillip & Western Port region (2016)	Aims to protect the environmental assets of the Port Phillip and Western Port region, and to enhance collaboration between organisations involved in environmental management in the area. This strategy sets targets for environmental assets in the Port Phillip and Western Port region including – native vegetation, native animals, waterways and wetlands, hinterland, coasts and the bays.
Local council plans	Refer to Appendix C e.g. Nillumbik Council Invasive Species Action Plan
Integrated NRM Plans – e.g. park management plans	Port Phillip and Westernport CMA, Invasive Plants and Animals Strategy addresses invasive plant and animal management in the Port Phillip and Westernport region. The objectives are; • Implement coordinated, cooperative and effective management of invasive plants and animals across the region. • Prevent the introduction and establishment of new high-risk invasive plants and animals. • Eradicate, contain or prevent further spread of established infestations of high-risk invasive plants and animals. • Address the risks of impacts of invasive plants and animals on the priority environmental and agricultural assets. • Improve management of invasive plants and animals through effective monitoring, evaluation and reporting.

Table 2. Summary table of pest animal legislation and land manager/tenure obligations

Appendix C
Summary of Network Pest Control Actions

The following pages outlines the eastern region management response to pest animals each local council/public land manager will take.

Banyule

Fox	Trapping, warren destruction at waterway parks and reserves, conservation reserves.
Feral Cat	N/A
Rabbit	Trapping, warren destruction at waterway reserves and conservation reserves (remnant grassland sites).
Deer	N/A
Common (Indian) Myna	Community based Common (Indian) Myna Action group across the Banyule residential areas with 50 current registered volunteers, cages and approved training in euthanasia. Ongoing trial program of provision of single entry, no return nest boxes to attract Mynas for control, based at Darebin Parklands with Local Rangers undertaking control works.

Boroondara

Fox	No specific programs listed.
Feral Cat	Cage traps available from the council for hire.
Rabbit	No specific programs listed.
Deer	No specific programs listed.
Common (Indian) Myna	No specific programs listed.

Cardinia

Reserve specific control program at RJ Chambers Reserve.

Biosphere Predator Control Strategy identifies priority control areas.

Fox	List foxes as a pest species. Reserve control at RJ Chambers Reserve. Utilise Westernport Biosphere Predator Control Strategy (Ecology Australia 2014)10.
Feral Cat	Cat traps available for hire.
Rabbit	N/A
Deer	Landcare community led Deer Shooting Control Program supported by Council. Running for 6 years in the Cannibal Creek Catchment on private land, (programs often also include the shooting of fox and rabbit) and the Cardinia Creek Catchment.
Common (Indian) Myna	Common (Indian) Myna trapping in high visitation sites such as Emerald Lake Park. Traps available to purchase.

10 Ecology Australia (2014). Predator Control Strategy for the Western Port Biosphere Reserve, Victoria. Prepared for the Western Port Biosphere Reserve Foundation. Available at https://www.biosphere.org.au/sites/default/files/wpbr_predator_control_strategy_final.pdf

Casey

Fox	Predator control (trapping, den destruction) at Western Port (Tooradin, Blind Bight, Warneet, Cannons Creek and Quail Island), Cardinia Creek, Koo wee Rup swamp and Royal Botanic Gardens Cranbourne.
Feral Cat	Predator control (trapping, den destruction) at Western Port (Tooradin, Blind Bight, Warneet, Cannons Creek and Quail Island), Cardinia Creek, Koo wee Rup swamp and Royal Botanic Gardens Cranbourne.
Rabbit	Ongoing sporadic control (warren destruction) throughout municipality.
Deer	N/A
Common (Indian) Myna	Lists Common (Indian) Myna prevention measures and offers euthanasia advice. Traps available for hire.

Frankston

Fox	No specific programs listed.
Feral Cat	No specific programs listed.
Rabbit	No specific programs listed.
Deer	No specific programs listed.
Common (Indian) Myna	No specific programs listed.

Greater Dandenong

Fox	No specific programs listed.
Feral Cat	No specific programs listed.
Rabbit	No specific programs listed.
Deer	No specific programs listed.
Common (Indian) Myna	No specific programs listed.

Knox

Fox	Fox trapping has been sporadic, contained to fenced areas and is often undertaken in response to public complaints and fox sightings near golf courses, kindergartens and childcare centers. Fox baiting is prohibited due to the potential poisoning of domestic animals. Locations include: Old Joes Ck Boronia, Quarry Reserve Upper Ferntree Gully, Lakewood Reserve, Knoxfield, Blind Creek Wantirna South, Dandenong Valley parklands.
Feral Cat	No feral cat control in Knox, though there are some processes in place to manage domestic cats. On January 1, 2020, Council will be introducing a 12-month pilot cat curfew.
Rabbit	Selectively and not on a regular basis. Rabbit baiting as main control mechanism, occasional shooting. Also, trialling fencing exclusion zones. Control usually undertaken to minimise impact on revegetation. Locations include: Orville Court, Heaney Park, Rowville, Reservoir Crescent Reserves, Rowville.
Deer	There is currently no deer control.
Common (Indian) Myna	Common (Indian) Myna Trapping program that launched in January 2018. People can trap Common (Indian) Mynas on their private property using a custom designed trap followed by approved euthanasia measures. As of June 2019, 107 traps had been sold, 89 properties were involved in trapping and 252 Common (Indian) Mynas had been caught. Trial in 2018 of Council led trapping at: Lakewood Reserve; Morris Reserve; Norton's Lane Reserve; and the Knox regional sports precinct. Proved to be time consuming, resource intensive and was largely ineffective (42 birds caught over 5 week period).

Manningham

Fox	Fox control grants offered to residents of up to $250 for each participant. Respond to landholder requests.
Feral Cat	Education programs and random resident trapping on private land.
Rabbit	Ongoing harbour removal across the green wedge area on both public and private land.
Deer	Shooting program at Brushy creek and Jumping creek catchments. Offer subsidy to private landholders.
Common (Indian) Myna	Random resident control across the municipality.

Maroondah

Fox	Soft jaw trapping and active den fumigation in bushland reserves
Feral Cat	Asks public to keep cats contained from dusk until dawn.
Rabbit	Minor control. Will destroy warrens, complete ferreting or trap around sporting grounds and golf courses if numbers get high. Have installed rabbit proof netting in bushland reserves but ceased due to animal welfare concerns.
Deer	N/A
Common (Indian) Myna	N/A

Melbourne Water

Fox	Surveys, den counts, spot lighting and trapping.
Feral Cat	Surveys, den counts, spot lighting and trapping.
Rabbit	Surveys, spotlighting, use of calicivirus, ripping.
Deer	Currently no shooting permitted on Melbourne Water lands. Monitoring at water reservoirs.
Common (Indian) Myna	N/A

Monash

Fox	Baiting of foxes in bushland reserves.
Feral Cat	Cat curfew to stop domestic cats becoming feral.
Rabbit	N/A
Deer	N/A
Common (Indian) Myna	Planting out areas to discourage Common (Indian) Mynas.

Nillumbik

Fox	Three-year project that has been funded by the State Government to trial the control of foxes in the vicinity of Bend of Islands, Watsons Creek and Christmas Hills using soft-jaw trapping.
Feral Cat	N/A
Rabbit	Rabbit action plan which includes control Target control efforts (trapping, ferreting, baiting) at priority bushland reserves and waterways (Diamond Creek); private properties with priority agricultural assets and bushland.
Deer	Three-year project to trial the control of deer near Bend of Islands, Watsons Creek and Christmas Hills using targeted shooting. Landowners that live within the project boundary are eligible to apply for free deer control.
Common (Indian) Myna	Targeted trapping in urban areas and farmland.

Parks Victoria

Fox	Trapping and baiting Bunyip Sate Park, Kurth Kiln Regional Park, Gembrook, Dandenong Ranges National Park, Yellingbo, Yarra Ranges, Yellingbo.
Feral Cat	Trapping and baiting Bunyip Sate Park, Kurth Kiln Regional Park, Gembrook, Dandenong Ranges National Park, Yellingbo, Yarra Ranges, Yellingbo.
Rabbit	Trapping and baiting: Lower Yarra, Warrandyte, Patterson River.
Deer	Shooting program at Cardinia creek, Bunyip Sate Park, Kurth Kiln Regional Park, Gembrook, Yarra Ranges/Yellingbo.
Common (Indian) Myna	N/A

Whitehorse

Fox	Reactive – respond to residential requests for fox control.
Feral Cat	N/A
Rabbit	N/A
Deer	N/A
Common (Indian) Myna	Trapping at Transfer station.

Yarra Ranges

Fox	Support private landholders to control foxes. No specific council programs.
Feral Cat	No specific council programs.
Rabbit	Support private landholders to control rabbits. No specific council programs.
Deer	Small state government grant to control deer (shooting) in the Yellingbo corridor.
Common (Indian) Myna	No specific council programs.

Appendix D
Operating Procedures

D1 Response Steps

1. Identify (the problem)

Network member to register incident report. Information standard: species name, date (of record), time (of record), recorder name, location (easting northing), location (address), description (number of individuals detected, detection method, terrain, general observations).

Quantify (the problem). Is this an outlier or repeat issue?

Identify the urgency. Is it a new incursion (increases chances of control before population established)? Is it in a sensitive area (biodiversity/social/economic) or area recently subject to bushfire? Can control options be included in existing works plan?

Map out initial response options. Consider suitable control options, integrated pest control options, safety, animal welfare, incident protocols, and communication plan.

Identify who are relevant stakeholders. Include immediate landowner, adjacent landowner, (permit) authorities, active local group (crown land).

Internal network reporting. Note issue arising in monthly round up email.

2. Educate

Communications

Internal: Inform asset manager (crown land), depot team (if relevant) of biosecurity duty and control response options. Request report back for control actions undertaken.

External: Inform landholder of CaLP duties (private land) and provide species profile (or similar) with recommended standard operating procedure/s. Request report back for control actions undertaken.

Regional Pest Animal Network: Report pest presence, act as coordination point for cross boundary or delegated matters.

Other stakeholders: Where relevant inform active local care group and adjacent landholders.

3. Control

Refer to species protocols (E2 – E6)

Identify most suitable suite of control tactics based on SOP requirements.

Plan integrated pest control program (location/s, season, actions, parties, follow up actions, monitoring plan). Include safety plan, animal welfare and incident plan.

Identify funding source or target grant application (single/regional/sub regional application).

Identify and obtain permits required to undertake control measures (or source external parties with permits required).

Field implementation.

Record action/ immediate outcome/follow up tasks required.

4. Monitor

Identify party/ies responsible.

Identify funding source or in-kind support (if separate/supplementary to control funding).

Debrief (calibrate) standard field methods to be implemented. Include safety briefing, animal welfare and incident plan.

Collate data received.

Report data to network at agreed intervals.

5. Direct

Identify delegated powers CaLP, or notify responsible party.

Encouragement and collaboration is preferred.

Repeat obstruction to be reported for Enforcement.

6. Enforce

Formal written request to comply.

Prosecution by exception.

Image: David Croft (Department of Planning, Industry and Environment)

D2 European Fox Protocols

Recommended Control Measures

Species mobility requires multiple, coordinated and sustained control methods.

Baiting

When to use	Cost	Advantages	Disadvantages
Late winter and spring when cubs are small. When there is a problem or to pre-empt one, for example, prior to lambing.	Most cost-effective method. Least labour-intensive.	Large areas covered quickly. Foxes very susceptible to well-made 1080 baits. Native animals tolerant of 1080 but may be affected if baits are misused.	Pets at risk. Baits should be hidden or lightly covered to camouflage them with surrounding groundcover wherever non-target animals are active. Uneaten baits should be retrieved.

SOP Hyperlink

FOX001: Ground baiting of foxes with sodium fluoroacetate (1080).
https://www.pestsmart.org.au/ground-baiting-of-foxes-with-1080

FOX007: Baiting of foxes with para-aminopropiophenone (PAPP).
https://www.pestsmart.org.au/fox007-baiting-foxes-para-aminopropiophenone-papp

Harbour Management (where applicable.)

When to use	Cost	Advantages	Disadvantages
Anytime except from August-September.	Expensive as requires trained machinery operator.	Can be used to target specific individuals.	May damage sensitive plant communities. Foxes may simply move to other areas.

Trapping

When to use	Cost	Advantages	Disadvantages
Use sparingly for problem foxes.	Very labour- intensive.	Large areas covered Can be used to target specific individuals. Correct use will safeguard pets.	Foxes can become 'trap shy' if traps are not well set. Trap use is regulated under the Prevention of Cruelty to Animals Regulations 2008.

SOP Hyperlink

FOX005: Trapping of foxes using padded-jaw traps.
https://www.pestsmart.org.au/trapping-of-foxes-using-padded-jaw-traps

FOX006: Trapping of foxes using cage traps.
https://www.pestsmart.org.au/trapping-of-foxes-using-cage-traps

GEN003: Trapping using soft net traps
https://www.pestsmart.org.au/trapping-using-soft-net-traps

Fumigation

When to use	Cost	Advantages	Disadvantages
August-October DEN-CO-FUME is the only fumigate product registered for use on foxes in Australia.	Time consuming and labour-intensive.	Suited to localised fox problems such as active dens within lambing paddocks or near poultry.	Not suitable as a larger scale control method

SOP Hyperlink

FOX004: Fumigation of fox dens using carbon monoxide.
https://www.pestsmart.org.au/fumigation-of-fox-dens-using-carbon-monoxide

Shooting

When to use	Cost	Advantages	Disadvantages
As an adjunct to other methods. For problem foxes.	Very labour-intensive.	Target specific.	Selective for young foxes. Not suitable in built-up areas.

SOP Hyperlink

FOX003: Ground shooting of foxes. https://www.pestsmart.org.au/ground-shooting-of-foxes

Exclusion Fencing

When to use	Cost	Advantages	
To protect lambing areas. To protect poultry.	Can be expensive.	No danger to pets.	Threat of predation still exists elsewhere. Needs ongoing maintenance.

Animal Husbandry

When to use	Cost	Advantages	
At all times. Important at lambing time.	Inexpensive. Can be integrated into routine farming practices.	Increased attention benefits stock. No danger to pets.	Threat of predation still exists. Foxes may move to other paddocks.

Property Hygiene

When to use	Cost	Advantages	Disadvantages
At all times.	Inexpensive. Can be integrated into routine farming practices.	Increased attention benefits stock. No danger to pets.	Threat of predation still exists. Foxes may move to other areas.

Use of Canid Pest Ejectors (devices with attractant and spring-loaded toxin).

When to use	Cost	Advantages	Disadvantages
At all times	Expensive	Greater target specificity than traditional baiting. Can be used repeatedly. Baits can be left for extended periods.	Training required.

Animal Welfare Considerations

To minimise the animal welfare implications of orphaning dependent cubs, where possible, it is preferable not to undertake baiting programs when vixens are lactating (i.e. August and September). This is also the time when vixens are moving around least within their territory thus reducing the likelihood of finding baits. To maximise the effect of fox control prior to spring lambing for example, baiting should be conducted during June and July when foxes are mating and more mobile.

Poisoning of non-target species can occur when other animals eat baits.

Risk of secondary poisoning (i.e. poisoning that occurs through the scavenging of tissues or entrails from a poisoned animal).

Emerging Issues

Australian Pesticide and Veterinary Medicine Authority (APVMA) approved use of 1080 poison capsules in Canid Pest Ejectors CPE in 2010

PAPP (para-aminopropiophenone) new pest animal toxin tool in fox management. APVMA currently considering approval of the new active constituent, 4-aminopropiophenone and registration of Foxecute Fox Bait.

Bounty systems found ineffective. Require set limit of participants, duration and area.

Barriers to effective fox control: insufficient priority for stakeholders, lack of impact definition, poor landscape scale coordination, lack of community engagement, funding, concern over perverse outcomes from poisoning non-target species (and domestic pets).

D3 Feral Cat Protocols

Recommended Control Measures

Species mobility requires multiple, coordinated and sustained control methods.

Baiting (Eradicat)

When to use	Cost	Advantages	Disadvantages
Late winter and spring when live prey availability is low.	Most cost-effective method. Least labour-intensive.	Large areas covered quickly. Cats very susceptible to well-made 1080 baits. Native animals tolerant of 1080 but may be affected	Pets at risk. Baits should be hidden or lightly covered to camouflage them with surrounding groundcover where ever non-target animals are active. Uneaten baits should be retrieved.

Harbour Management e.g. dense plantings (where applicable.)

When to use	Cost	Advantages	Disadvantages
Anytime.	Expensive.	Can provide habitat for a range of species.	Cats may simply move to other areas.

Trapping

When to use	Cost	Advantages	Disadvantages
Use sparingly for problem cats.	Very labour- intensive.	Can be used to target specific individuals. Correct use will safeguard pets.	Cats can become 'trap shy' if traps are not well set. Trap use is regulated under the Prevention of Cruelty to Animals Regulations 2008.

SOP Hyperlink

CAT002: Trapping of feral cats using cage traps.
https://www.pestsmart.org.au/trapping-of-feral-cats-using-cage-traps

CAT003: Trapping of feral cats using padded-jaw traps.
https://www.pestsmart.org.au/trapping-of-feral-cats-using-padded-jaw-traps

Shooting

When to use	Cost	Advantages	Disadvantages
As an adjunct to other methods. For problem cats.	Very labour- intensive.	Target specific.	Not suitable in built-up areas.

SOP Hyperlink

CAT001: Ground shooting of feral cats.
https://www.pestsmart.org.au/ground-shooting-of-feral-cats

Exclusion Fencing

When to use	Cost	Advantages	Disadvantages
To protect poultry.	Can be expensive.	No danger to pets.	Threat of predation still exists elsewhere. Needs ongoing maintenance

Animal Husbandry

When to use	Cost	Advantages	Disadvantages
At all times.	Inexpensive. Can be integrated into routine farming practices.	Increased attention benefits stock. No danger to pets.	Threat of predation still exists. Cats may move to other areas.

Property Hygiene

When to use	Cost	Advantages	Disadvantages
At all times.	Inexpensive. Can be integrated into routine farming practices.	Increased attention benefits stock. No danger to pets.	Threat of predation still exists. Cats may move to other areas.

Use of Pest Ejectors (devices with attractant and spring-loaded toxin)

When to use	Cost	Advantages	Disadvantages
At all times.	Expensive.	Greater target specificity than traditional baiting. Can be used repeatedly. Baits can be left for extended periods.	Training required

Animal Welfare Considerations

Feral cats are likely to suffer distress from being confined in a cage trap and they can sometimes be injured while trying to escape. Facial injuries are common. To minimise the animal welfare implications of leaving dependant kittens to die a slow death from starvation, it is preferable not to undertake trapping when females are lactating e.g. September to March in non-urban habitats. There is a high probability that any female cat over six months old that is caught during this time will be pregnant or lactating

Traps are not target specific, therefore other species such as birds and reptiles may be caught. Poisoning of non-target species can occur when other animals eat baits.

Risk of secondary poisoning (i.e. poisoning that occurs through the scavenging of tissues or entrails from a poisoned animal).

Key Stakeholders

Local Councils, Landholders & Producer Groups, Community groups (e.g. Landcare) Invasive Animals CRC, DELWP, DJPR, Invasive Plants and Animals Committee.

Emerging Issues

- 'Genetic drive' technology is an emerging research area with potential for vertebrate pest population control where modified genetic traits can copy themselves onto both copies of the chromosomes. Science still in its infancy.
- New cat baiting technology and techniques currently being trialled: Eradicat®, Curiosity ®, History
- Three factors are critical to successful baiting programs 1) bait density and bait encounter; 2) the abundance of prey items; and 3) weather conditions at the time of baiting.
- Trapping is also a useful follow-up technique post-baiting for the collection of biological information, and to enable radio-collaring of individuals to monitor various key parameters.
- Community attitude to pet cats and cat containment is a barrier to invasive species management of feral cats.

D4 European Rabbit Protocols

Recommended Control Measures

Species mobility requires multiple, coordinated and sustained control methods.

Where a land owner is served with a control notice, such as a Directions Notice or Land Management Notice, in accordance with the Catchment and Land Protection Act 1994, the land owner must comply with the specific requirements of that notice including undertaking the required measures listed in that notice during the stipulated time frame.

1080 Baiting

When to use	Cost	Advantages	Disadvantages
Late summer. Before seeding, planting or regeneration efforts.	Most cost-effective method.	Large areas covered quickly. Most native animals tolerant of 1080 but can be affected if baits misused. Foxes killed by eating poisoned rabbits.	No effective antidote. Livestock and pets can be at risk. Uneaten baits should be buried or weathered by exposure to rain. Dry weather required.

SOP Hyperlink

RAB002: Ground baiting of rabbits with 1080.
https://www.pestsmart.org.au/ground-baiting-of-rabbits-with-1080

Shooting and Trapping

When to use	Cost	Advantages	Disadvantages
Best late summer.	Very labour- intensive.	Must be used with other methods, to be useful.	Only appropriate for low rabbit numbers. Trapping and shooting not suitable in built-up areas.

SOP Hyperlink

RAB008: Trapping of rabbits using padded-jaw traps.
https://www.pestsmart.org.au/trapping-of-rabbits-using-padded-jaw-traps

RAB009: Ground shooting of rabbits.
https://www.pestsmart.org.au/ground-shooting-of-rabbits

Exclusion Fencing

When to use	Cost	Advantages	Disadvantages
Before planting or seeding.	Very labour-intensive. High initial cost.	Long-term effect stops reinvasion.	Needs regular checking.

Myxamatosis and RHD

When to use	Cost	Advantages	Disadvantages
Naturally spread.	No cost.	Effective in reducing numbers before other controls are used.	Timing and effectiveness unpredictable.

SOP Hyperlink

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

Animal Welfare Considerations

To minimise the animal welfare implications of leaving dependent young to die a slow death from starvation it is preferable not to undertake baiting programs when rabbits are known to be breeding. This is also the time when young rabbits do not travel far from their burrows and bucks vigorously defend their territorial boundaries, making it less likely that all rabbits will have access to bait. In many areas of Australia there is a peak in breeding from late winter to early summer when pastures have greened up after rain.

Poisoning of non-target species can occur either directly by eating the carrot, oat or pellet baits intended for rabbits (primary poisoning) or through the tissues from a dead or dying poisoned animal (secondary poisoning.

Key Stakeholders

Local Councils, Landholders & Producer Groups, Community groups (e.g. Landcare) Invasive Animals CRC, DELWP, DJPR, Invasive Plants and Animals Committee.

Emerging Issues

Given how widely established rabbits are in Australia, management tends to focus limited resources on abating their impacts rather than eradication. However, eradication may be achievable in isolated areas such as small reserves, enclosures, and offshore islands.

Low-density rabbit populations can cause significant damage to native plants and pastures, suggesting there might be no 'safe' level of rabbit density.

Rabbit control requires repeat control efforts and monitoring within clear performance targets.

Propane gas fumigation units to control rabbits in sensitive areas, such as Aboriginal heritage sites, and around threatened plant communities and infrastructure, may be used.

Further Reading

Integrated rabbit control for rural and natural landscapes. http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/pest-animals/invasive-animal-management/established-invasive-animals/integrated-rabbit-control-for-rural-and-natural-landscapes

Integrated rabbit control in urban and semi-urban areas. http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/pest-animals/invasive-animal-management/established-invasive-animals/integrated-rabbit-control-in-urban-and-semi-urban-areas

Model code of practice for the humane control of rabbits. https://www.pestsmart.org.au/model-code-of-practice-for-the-humane-control-of-rabbits

D5 Feral Deer Protocols

Recommended Control Measures

Ground shooting by qualified marksmen working under Standard Operating Procedures for humane deer shooting (Sharpe, Invasive CRC 2012) is considered the most effective method of control in accessible terrain. Protocols recommend against shooting in fawning season to prevent inhumane death of orphaned fawn. Trapping (followed by shooting or transportation), recreational shooting and exclusion fencing (to contain or omit specific populations) are alternative management mechanisms with variable long-term effect.

Shooting

When to use	Cost	Advantages	Disadvantages
All year.	Most cost-effective method.	Most effective technique currently available for reducing deer populations. Target specific.	Requires experienced, skilled shooters with appropriate licences and accreditation. Not suitable in urban areas or in inaccessible or rough terrain where sighting of target animals and accurate shooting is difficult or when wounded animals cannot easily be followed up and killed.

SOP Hyperlink

DEE001: Ground shooting of feral deer.
https://www.pestsmart.org.au/ground-shooting-of-wild-deer

Exclusion Fencing

When to use	Cost	Advantages	Disadvantages
Any time.	Very labour-intensive. High initial cost	Long-term effect stops reinvasion.	Needs regular checking.

Animal Welfare Considerations

The humaneness of shooting as a control technique depends almost entirely on the skill and judgement of the shooter. If properly carried out, it is one of the most humane methods of killing feral deer. On the other hand, if inexpertly carried out, shooting can result in wounding which may cause considerable pain and suffering.

Shooting is relatively target specific and does not usually impact on other species. However, there is always a risk of injuring or killing non-target animals, including livestock, if shots are taken only at movement, colour, shape, or sound. Only shoot at the target animal once it has been positively identified and never shoot over the top of hills or ridges.

Key Stakeholders

Local Councils, Landholders & Producer Groups, Community groups (e.g. Landcare) Invasive Animals CRC, DELWP, DJPR, Invasive Plants and Animals Committee.

Emerging Issues

Feral deer are increasingly encroaching into peri-urban areas posing a significant threat to agriculture, conservation reserves and human safety.

Feral deer control is limited by the listing of all deer as 'wildlife' for the purposes of the Wildlife Act 1975 (the Act). 'Wildlife' are further considered to be 'protected wildlife' and may not be destroyed without authorisation, except where they are listed under the Catchment and Land Protection Act 1994 (CALP Act) or where they are declared to be 'unprotected' under the Act. Six deer species are listed as game for hunting. These include the most established and widespread deer in Victoria listed as game.

D6 Common (Indian) Myna Protocols

Recommended Control Measures

Harbour Manipulation. e.g. dense plantings (where applicable.)

When to use	Cost	Advantages	Disadvantages
Anytime.	Expensive.	Can provide habitat for a range of species.	Common (Indian) Myna may simply move to other areas.

Trapping

When to use	Cost	Advantages	Disadvantages
Pre and post breeding season. Breeding season in Southern Australia – October – March.	Very labour-intensive.	Can be used to target specific individuals/ populations.	Common (Indian) Myna can become 'trap shy' if traps are not well set. Trap use is regulated under the Prevention of Cruelty to Animals Regulations 2008. Can capture non-target species. Euthanasia via carbon monoxide inhalation or cervical dislocation can prove difficult to implement in practice.

SOP Hyperlink
BIR002: Trapping of Pest Birds. https://www.pestsmart.org.au/trapping-of-pest-birds

Shooting

When to use	Cost	Advantages	Disadvantages
Pre and post breeding season. Breeding season in Southern Australia – October – March.	Very labour-intensive.	Target specific.	Not suitable in built-up areas.

SOP Hyperlink
BIR001: Shooting of Pest Birds. https://www.pestsmart.org.au/shooting-of-pest-birds

Property Hygiene

When to use	Cost	Advantages	Disadvantages
At all times.	Inexpensive. Can be integrated into routine farming practices.	Increased attention benefits stock. No danger to pets.	Threat of predation still exists. Cats may move to other areas.

Animal Welfare Considerations

Trapped birds are likely to suffer from distress when confined and they can sometimes be injured while trying to escape from the trap or during capture or restraint prior to euthanasia. To minimise the animal welfare implications of leaving dependent nestlings and chicks to die from starvation it is preferable not to undertake trapping during the nesting season. If trapping must occur during nesting, reasonable efforts should be made to find nest hollows containing young birds, so they can be killed quickly and humanely.

Traps are not target specific; therefore, other species, usually birds, may be caught. To reduce the impact on non-target species, traps should be placed in areas that are frequented by the target species. Free-feeding can assist in identifying the likelihood of capturing non-target species, and appropriate areas for capture.

Key Stakeholders

Local Councils, Landholders & Producer Groups, Community groups (e.g. Landcare) Invasive Animals CRC, DELWP, DJPR, Invasive Plants and Animals Committee.

Emerging Issues

Increasing landscape modification and fragmentation of native vegetation for industry and urban settlement will help the Common (Indian) Myna to increase its range in Victoria.

Appendix E
Action Plan Template

Objectives and Actions	Outcome	Target pest/s and asset/s	Responsible Parties	Resources	Priority and Timeframe	Key performance indicator	Context and comments

Appendix F
Pest Animal Management Resources

F1 Federal Control Resources

Australian Pest Animal Strategy 2017-2027. Invasive Plants and Animals Committee http://www.agriculture.gov.au/SiteCollectionDocuments/pests-diseases-weeds/consultation/apas-final.pdf

Invasive Animals Cooperative Research Centre
National Rabbit Biocontrol Optimisation: https://invasives.com.au/research/national-rabbit-biocontrol-optimisation/

Landscape-scale Predator Management: https://invasives.com.au/research/preparing-reset-landscape-scale-predator-management/

Management of wild dog and deer in peri-urban landscapes: strategies for safe communities: https://invasives.com.au/research/management-wild-dog-deer-peri-urban-landscapes-strategies-safe-communities/

Cost effective management of wild deer: https://invasives.com.au/research/cost-effective-management-wild-deer/

Tools for developing cost-effective decisions for managing invasive pest eradications: https://invasives.com.au/research/tools-developing-cost-effective-decisions-managing-invasive-pest-eradications/

Viewing invasive species removal in a whole-ecosystem context. Zavaleta, Hobbs & Mooney (2001).: https://www.esf.edu/efb/parry/invasivesseminar_readings/Zavaleta_etal_2001.pdf

Intellitraps: https://invasives.com.au/research/intellitraps/

Feral deer aggregator: https://invasives.com.au/research/feral-deer-aggregator/

Carbon Monoxide Rabbit Warren Fumigator: https://invasives.com.au/research/carbon-monoxide-fumigator/

Australian Animal Welfare Strategy (AAWS) and National Implementation Plan 2010-14 http://www.agriculture.gov.au/animal/welfare/aaws/australian-animal-welfare-strategy-aaws-and-national-implementation-plan-2010-14

Feral Deer Fact Sheet
https://www.environment.gov.au/system/files/resources/c6679b32-5f03-4839-aa57-9c5723153b0f/files/fs-feral-deer.pdf

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.

Proceedings of the National Feral Deer Management Workshop. Canberra, November 2005 http://www.pestsmart.org.au/wp-content/uploads/2010/03/Deer-Workshop_final.pdf#page=120

F2 State Control Resources

Victorian Pest management: A Framework for Action

https://www.pestsmart.org.au/victorian-pest-management-a-framework-for-action/

Biodiversity 2037

NaturePrint and strategic Management Prospects (SMP): https://www.environment.vic.gov.au/biodiversity/natureprint

Agriculture Victoria: Pest Animals, Invasive animal management
http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/pest-animals/invasive-animal-management

Draft Victorian Deer Management Strategy
https://engage.vic.gov.au/draft-victorian-deer-management-strategy

F3 Local Control Guidelines

Boroondara Council, Waste & Environment, Animals – Foxes in Boroondara webpage
https://www.boroondara.vic.gov.au/waste-environment/animals/foxes-boroondara

Boroondara Council, Waste & Environment, Animals – Cats-Hire a cat cage webpage
https://www.boroondara.vic.gov.au/waste-environment/animals/cats

Cardinia Council, managing animal pests webpage (Foxes only)
https://www.cardinia.vic.gov.au/info/20003/pets_and_animals/45/managing_animal_pests

City of Casey council, Pests and Animals, Problems with animals' webpage
https://www.casey.vic.gov.au/cats-dogs

https://www.casey.vic.gov.au/nuisance-birds

Nillumbik Council's Sugarloaf link project (feral deer and fox control program).
https://www.nillumbik.vic.gov.au/Environment/Natural-environment/Pest-animals

Nillumbik Council Rabbit Action Plan.
https://www.nillumbik.vic.gov.au/Environment/Natural-environment/Pest-animal

Nillumbik Council Invasive Species Action Plan, Rabbit Control brochure, Fox control information sheet, Deer control on private property guideline, Controlling pest animals fact sheet (all available as links at the bottom of the page).
https://www.nillumbik.vic.gov.au/Environment/Natural-environment/Pest-animals

Port Phillip and Westernport CMA Invasive Plants & Animals Strategy.
Available https://www.ppwcma.vic.gov.au/Resources/PublicationDocuments/77/PPWCMA%20IPA%20Strategy%20FINAL.pdf

Image: commons.wikimedia.org/wikipedia/commons/3/3d/Feral_cat_with_galah.jpg (Mark Marathon)