Lake Macquarie City Council Vertebrate Pest Management Strategy 2012 - 2018

Lake Macquarie City Council

Prepared by Lake Macquarie City Council

List of Abbreviations and Acronyms

AM	Asset Management (Department of Council)
CAP	Catchment Action Plan
CIV	CiviLake (Department of Council)
COP	Codes of Practice
CP	Community Planning (Department of Council)
CS&C	Customer Service and Communications (Department of Council)
EPBC	Environmental Protection and Biodiversity Conservation Act 1999
ESAP	Environmental Sustainability Action Plan
GIS	Geographical Information System
HCRCMA	Hunter Central Rivers Catchment Management Authority
LGA	Local Government Area
LHPA	Livestock Health and Pest Authority
LMCC	Lake Macquarie City Council
NKTP	National Key Threatening Process
NPWS	National Parks and Wildlife Service
NSW DPI	New South Wales Department of Primary Industries
OEH	Office of Environment and Heritage
PPP	Priority Pest Plan
PROP	Property Services (Department of Council)
SEWPaC	Department of Sustainability, Environment, Water, Population and Communities
SKTP	State Key Threatening Process
SOP	Standard Operating Procedure
SQID	Stormwater Quality Improvement Device
SUST	Sustainability Department (Department of Council)
TAP	Threat Abatement Plan
TSC Act	NSW Threatened Species Conservation Act 1995
VPMS	Vertebrate Pest Management Strategy
WER	Waste, Environment and Rangers

Glossary

Best practice guidelines	Control protocols that seek to balance cost-effectiveness, non-target damage and humaneness.
Code of Practice (COP)	NSW DPI have prepared a COP for each of the key pest species. They provide general information on best practice management, control strategies, species biology and impact, and the humaneness of current control methods.
Common pest	Pest widely distributed throughout a region.
Declared pest	A species nominated by the Minister for Agriculture as a pest under the *Rural Lands Protection Act 1998*.
Emerging species	A newly established pest species whose distribution and abundance is expanding.
Incursion	An isolated population of an invasive pest species detected in an area where it has not been previously established.
Invertebrate	An animal without a backbone eg. insects.
New invasive species	Any introduced species not previously recorded in NSW whose impacts are likely to be significant, or a species previously recorded in NSW that has since exhibited invasiveness.
Standard Operating Procedure (SOP)	Prepared by NSW DPI, SOPs describe management techniques and their application for pest animal species including a discussion of animal welfare impacts for target and non-target species, as well as covering the health and safety aspects of management techniques.
Uncommon pest	Pests known to occur within an area, but in low numbers.
Vertebrate pest	Introduced non-human vertebrate animal (has a backbone) that has, or has the potential, to have an adverse economic, environmental or social/cultural impact.

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1 INTRODUCTION

This document is referred to as the Vertebrate Pest Management Strategy (VPMS). The VPMS does not apply to mice, rats and similar pests. Native animals such as magpies, possums and snakes that are sometimes considered a pest to humans are also not dealt with in the VPMS.

For the purpose of the VPMS a vertebrate pest is an introduced non-human vertebrate animal that has, or has the potential to have, an adverse economic, environmental or social/cultural impact.

Vertebrate pests can have significant impacts on biodiversity and productivity. Some species cause significant damage to crops and seriously affect livestock industries by preying on stock, competing for pasture or causing severe land degradation, stream turbidity and the spread of weeds. Many pest animal species threaten the survival of native plants and animals through competition, habitat destruction and predation. Some species also act as reservoirs for diseases that can affect native wildlife, domestic stock or people.

Pest animals can also have considerable social impacts, including being a nuisance, damaging infrastructure or culturally important sites, causing traffic incidents, as well as having important (but largely unreported) social and psychological effects on primary producers and their families (Natural Resource Management Ministerial Council, 2007).

Council recognises that vertebrate pests have the potential to seriously impact upon environmental, social and economic values and resources within the City of Lake Macquarie. Consequently, the purpose of this VPMS is to establish a strategic direction for vertebrate pest management activities by Council within the City over the period 2012 – 2018.

1.1 LANDS SUBJECT TO THE STRATEGY

The VPMS applies to all Council managed land including:

1. Council owned Community land;
    - Sportsgrounds
    - Parks
    - Natural areas (bushland, wetland, foreshores, escarpments, watercourses)
    - General community use (leased areas, public halls, child care centres, senior citizens centre)

Each of these land categories are currently managed by Council under a generic Plan of Management for Community land. Consequently, relevant principles and actions within the VPMS will need to be incorporated into future reviews of the generic Plan of Management, and into separate Plans of Management as they are developed.

2. Council owned Operational land;
3. Council managed Crown land;
    - Caravan parks
    - Other Council managed Crown reserves.

The VPMS does not apply to private property, or land under the care and control of other government agencies. All landholders are responsible for pest control on their own land.

1.2 STRATEGY AIM AND OBJECTIVES

1.2.1 Mission Statement

To work cooperatively with the community and other land managers to prevent, reduce and control the negative impacts of vertebrate pests in the City of Lake Macquarie.

1.2.2 Strategy Aim

The aim of the VPMS is to provide Council with a process for effectively managing vertebrate pest populations for the purpose of protecting ecological, economical and social values within the City of Lake Macquarie. The VPMS identifies the major established and emerging vertebrate pest populations within the City, and uses a risk-based approach for prioritising a variety of control programs and actions.

1.2.3 Objectives

The objectives of the VPMS are to:

- satisfy legislative requirements;
- conserve biodiversity;
- manage vertebrate pests populations to minimise their impact on LMCC managed land and the health, safety and amenity of the community subject to allocated resources;
- support a cooperative approach to pest management with other NSW State Government agencies and the community;
- minimise the risk of new vertebrate pests becoming established, where feasible; and
- collect vertebrate pest information and make it available to the community.

1.3 CITY OF LAKE MACQUARIE

The City of Lake Macquarie covers an area of 787.4 square kilometres of mountains, coastline beaches and coastal plains. The area encircles one of the largest coastal saltwater lagoons in the southern hemisphere (LMCC 2011a).

The City is rich in natural biological diversity with over 38,000 hectares of remnant vegetation, wooded mountainsides, freshwater streams, wetlands, saltmarsh, sandy beaches, rocky shores, and Lake Macquarie (LMCC 2011a).

The City of Lake Macquarie is one of the fastest growing cities in the Hunter Region, and the fourth largest in NSW, with a population over 200,000. This population is expected to grow by 60,000 – 70,000 people in the next 25 years (LMCC 2011a).

Rapid population growth places numerous pressures on biodiversity in the City. The main threats to biodiversity include: habitat loss and fragmentation due to urban, rural or industrial development and mining; impacts caused by pest animals and introduced plants; altered fire regimes and climate change.

There are currently 104 threatened species recorded in the City, including species such as the Squirrel Glider, Green and Golden Bell Frog, Powerful Owl, and the Black-eyed Susan plant (LMCC 2011b).

2 CURRENT MANAGEMENT OF VERTEBRATE PESTS

2.1 RELEVANT LEGISLATION

Pest animal related legislation, particularly in NSW, is extensive and diverse. The Federal and State Acts relevant to pest management are listed below, and discussed in detail in Appendix A. The relevant Acts include:

- Environment Protection and Biodiversity Conservation Act 1999
- Threatened Species Conservation Act 1995
- Fisheries Management Act 1994
- Pesticides Act 1978
- Rural Lands Protection Act 1998
- Local Government Act 1993
- Game and Feral Animals Act 2002
- Prevention of Cruelty to Animals Act 1979
- Firearms Act 1996
- Work Health and Safety Act 2011
- National Parks and Wildlife Act 1974
- Environmental Planning and Assessment Act 1979

2.2 RELEVANT PEST MANAGEMENT STRATEGIES

The Lake Macquarie VPMS compliments other existing strategies such as *Australia's Biodiversity Conservation Strategy (2010), Australian Pest Animal Strategy (2007),* and the *NSW Invasive Species Plan (2008)*. It also provides links with regional catchment based plans as well as other LMCC specific documents such as the *Environmental Sustainability Action Plan* and the *Vertebrate Pest Policy.* These documents are discussed in more detail in section 2.3.8 (see Figure 1 for a diagram showing the hierarchy of other vertebrate pest management strategies).

2.2.1 Australia's Biodiversity Conservation Strategy 2010 – 2030

The Natural Resource Management Ministerial Council, represented by Ministers from all state and territory governments and the Australian Government, has produced *Australia's Biodiversity Conservation Strategy 2010-2030*. This Strategy functions as a policy 'umbrella' over other more specific national frameworks (see Australia Pest Animal Strategy below). The overall goal of the strategy is to guide how governments, the community, industry and scientists manage and protect Australia's plants, animals and ecosystems over the next 20 years.

The most relevant action identified within this Strategy is Priority for Action 2.3 – 'Reducing threats to biodiversity'. This action sets a target to reduce the impacts of invasive species on threatened species and ecological communities in terrestrial, aquatic and marine environments by at least 10% by 2015.

2.2.2 Australian Pest Animal Strategy

The Australian Pest Animal Strategy (2007) is a national framework agreed by all Australian governments. It sets out how governments will work with each other, with business, industry and researchers and the community to manage the challenges associated with vertebrate pest management in Australia.

The Strategy documents objectives and actions that aim to prevent the introduction and spread of new pest animals in Australia, and assist in managing the impacts of pest species that are already established.

2.2.3 New South Wales Invasive Species Plan 2008 – 2015

This Plan, prepared by the NSW Department of Primary Industries, aims to prevent and effectively manage the introduction and spread of invasive species to minimise the threat posed to biodiversity and primary production in NSW.

The Plan proposes actions to prevent, contain and manage invasive species, including weeds, vertebrate and invertebrate animal pests, freshwater and marine aquatic pests.

2.2.4 NSW DPI Vertebrate Pest Control Manual

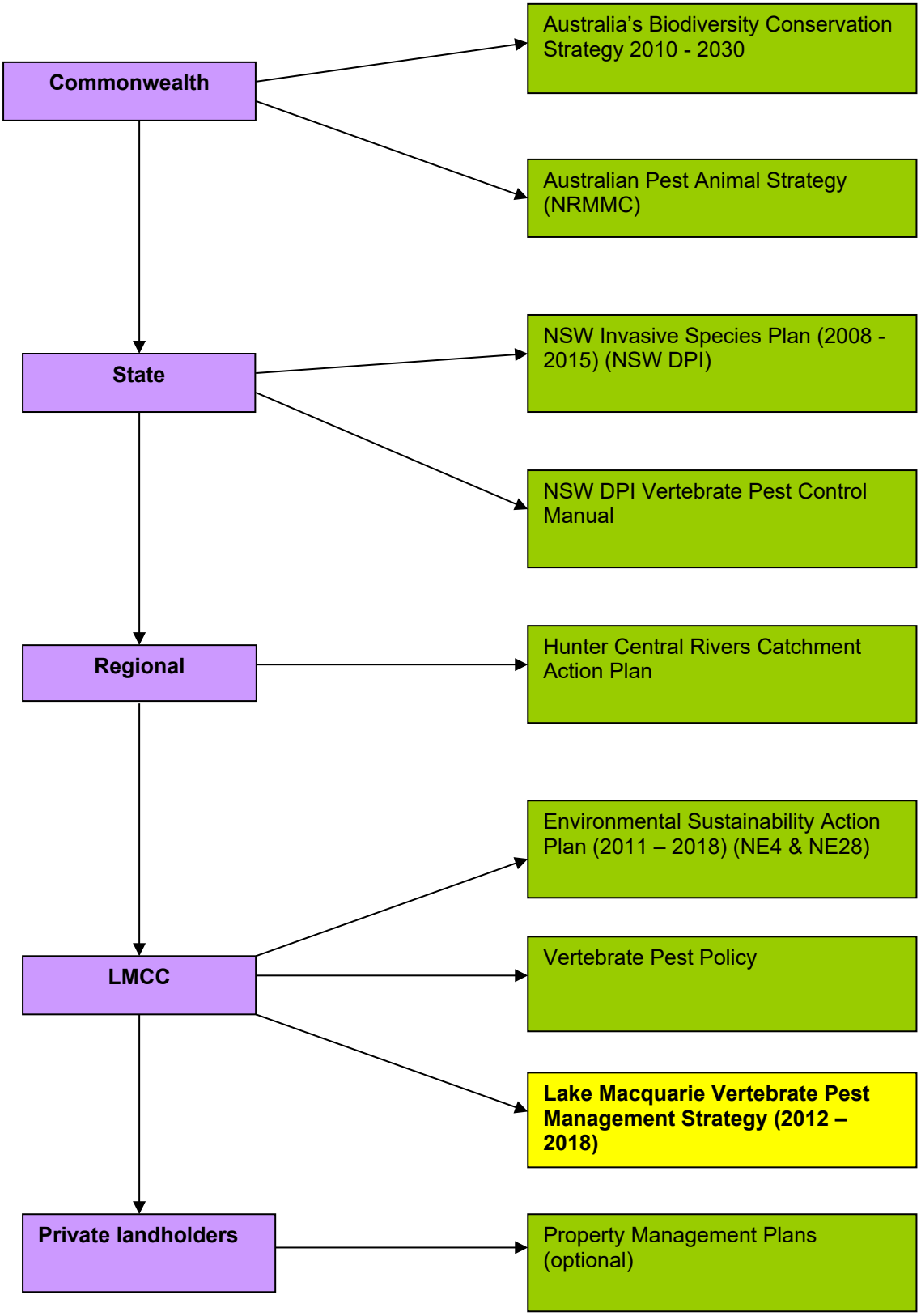
This manual was written primarily for agencies involved in vertebrate pest control. It is intended to promote uniform standards of control, administration and safety throughout the state.

Control techniques and general summary of the biology and behaviour of the major vertebrate pests (rabbits, feral pigs, wild dogs, foxes, mice, feral goats, and deer) are supplied.

2.2.5 Hunter – Central Rivers Catchment Action Plan (2007-2016)

Management Target: MT08 of the Hunter-Central Rivers Catchment Action Plan (2007) sets the target to treat animal pests over 31,000 ha by 2016 (HCRCMA 2007).

Figure 1: Vertebrate Pest Management Framework



2.3 GOVERNMENT AGENCIES

2.3.1 Department Of Sustainability, Environment, Water, Population and Communities

The Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) is responsible for administering the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), which includes a national list of threatening processes to Australia's biodiversity. SEWPaC has also prepared a series of Threat Abatement Plans (TAPs), that provide priority actions to guide public land managers in managing each threatening process and facilitate the recovery of nationally listed threatened species, populations and ecological communities.

The SEWPaC also oversees the implementation of the *Australian Pest Animal Strategy* discussed in section 2.2.2.

2.3.2 Office of Environment and Heritage

The Office of Environment and Heritage (OEH), which includes the NSW National Parks and Wildlife Service (NPWS), gives a high priority to managing vertebrate pest animals in their national parks.

As the complete eradication of pests over large areas is rarely practicable, NPWS consider it necessary to prioritise pest management efforts and allocate resources to those areas where they will be of greatest benefit. Priorities include those areas where new pest outbreaks occur, where threatened native plants and animals are at risk from the impacts of pests, and where there is a need to minimise the impacts of pests on neighbouring lands, such as farmland (www.environment.nsw.gov.au/pestsweeds/pestweedmgmtnsw.htm accessed 30 November 2011).

NPWS prepares Regional Pest Management Strategies that detail priorities for each region, including actions listed in the Threatened Species Priority Action Statement and TAPs as well as other actions, such as wild dog and feral pig control, to protect neighbouring properties. A Draft Regional Pest Management Strategy 2012-2015 has been prepared for the Central Coast Hunter Range Region, which includes the City of Lake Macquarie.

NPWS also believes that the key to successful pest management is cooperation. NPWS actively works with other state government agencies, Catchment Management Authorities, local governments, private landholders and community groups.

2.3.3 NSW Department of Primary Industries

Agriculture

The Agriculture section of the Department of Primary Industries has prepared a series of Standard Operating Procedures (SOP) and Codes of Practice (COP) for anyone engaged in pest animal control.

SOPs discuss animal welfare impacts for target and non-target species and describe techniques and their application, as well as covering health and safety aspects. COPs have been prepared for each of the key pest animal species and provide general information on best practice management, control strategies, species biology and impact, and the humaneness of current control methods.

NSW DPI Agriculture also has a Vertebrate Pest Control Unit that conducts research on vertebrate pest animals and their impacts.

NSW DPI is also responsible for the production of the New South Wales Invasive Species Plan 2008 – 2015, as discussed in section 2.2.3.

Forests

Forests NSW is responsible for the management of State Forests in the City of Lake Macquarie. Vertebrate pests are of concern in State Forests when they affect environmental or economic values of the forest or neighbours. Animals that are of concern to the health of planted forests in the Northern Region of State Forests (management area in which the City of Lake Macquarie falls) include: rabbit, hare, deer, goat, fox and pig (NSW Forests, 2008).

Forests NSW prepares and implements regional management plans (Ecologically Sustainable Forest Management Plans). These Plans include annual operational programs for pest animal control.

Fishing and Aquaculture

NSW DPI Fishing and Aquaculture has responsibilities for the conservation and management of the fish and marine vegetation of NSW, including the management of pest species.

Pest species can threaten indigenous aquatic and terrestrial life directly as predators and/or competitors for food or indirectly by altering their natural habitat. Pests are also thought to contribute to the decline of some threatened native species.

DPI has set three classifications for noxious fish or marine vegetation in NSW, representing the different levels of threat they pose to the aquatic environment. Different rules apply to each class.

The two known noxious freshwater fish species that have established populations in the City of Lake Macquarie waterways are Carp and Mosquito Fish.

Crown Lands

Crown Lands has legislative responsibilities to eradicate pest animals on land under its control. Pest animal control programs undertaken by Crown Lands include support for the Fox Threat Abatement Plan prepared by the former Department of Environment and Conservation and 'Outfox the Fox', an initiative of NSW DPI and the LHPAs. The division also supports Regional Wild Dog Management Plans and Recovery Plans for threatened native species (http://www.lpma.nsw.gov.au/crown_lands/environment accessed 25 November 2011).

2.3.4 Game Council of NSW

The Game Council of NSW is a statutory authority established under the *Game and Feral Animal Control Act 2002.* The main objective of the Game Council is to utilise the efforts of licensed and accredited hunters to assist in the reduction of selected vertebrate pest species such as rabbit, fox, deer, hare, cat and dog. At present, 400 State Forests and Crown Land areas have been declared open for hunting by holders of a NSW Game Hunting Licence (www.gamecouncil.nsw.gov.au/portal.asp?p=WhereCanIHunt accessed 2 December 2011). In the City of Lake Macquarie there are two State Forests declared open for licensed hunting; Awaba and Olney.

2.3.5 Livestock Health and Pest Authority

Operates under the *Rural Lands Protection Act 1998*. Under this Act all land managers in NSW, whether on public or private land, have an obligation to control declared pest species on their land. One of the roles of the LHPA is to provide

advice and assistance to land managers on eradicating declared pest species. It also works with private and government stakeholders to develop vertebrate pest management plans and cooperative management plans.

The Cumberland LHPA operates in the City of Lake Macquarie.

2.3.6 Hunter Central Rivers Catchment Management Authority

The Hunter Central Rivers Catchment Management Authority (HCRCMA) is responsible for managing natural resources at the catchment scale. Key roles include preparing Catchment Action Plans (CAPs) and managing incentive programs to implement the plans. In terms of pest management, the role of the HCRCMA is largely a strategic, planning and coordination role for the region.

2.3.7 Invasive Animals Cooperative Research Centre

The Invasive Animals Cooperative Research Centre is funded by the Commonwealth Government. The role of the Centre is to create new technologies and integrated strategies to reduce the impact of invasive animals on Australia's economy, environment, and people. The Centre is unique in that it is one of the first times that research, industry, environmental, commercial and government agencies have worked together to create and apply solutions for invasive animal threats.

2.3.8 Lake Macquarie City Council

Vertebrate Pest Policy

LMCC first adopted a Vertebrate Pest Policy in 2003 as an initial response to manage the impacts that vertebrate pests were having on the environment of the City. The Policy outlined the impacts particular vertebrate pest species were having on the City's environment, Council's legislative responsibilities to control vertebrate pests on Council land, and identified particular circumstances when vertebrate pest control programs should be undertaken. The Vertebrate Pest Policy was recently revised to reflect the objectives and key pest management principles for the management of vertebrate pests in the City of Lake Macquarie that are contained within the VPMS.

Environmental Sustainability Action Plan 2011 – 2018

The Environmental Sustainability Action Plan (ESAP) sets out strategic objectives, actions, community/organisational indicators and departmental responsibilities for the delivery of environmental sustainability outcomes in the City of Lake Macquarie.

Identified within the Natural Environment section of the ESAP is the need for the development of response strategies for actual and potential pests. The preparation of this VPMS is a response to this management action.

LMCC Pesticide Use Notification Plan

This Pesticide Use Notification Plan was prepared in response to the requirements of the Pesticides Regulation 1995 (the Regulation).

The aim of this Plan is to meet the community's general right to know about pesticide applications made to public places. The Plan allows members of the community to take action to avoid contact with pesticides.

The Plan sets out how Council will notify members of the community of pesticide applications it makes, or allows to be made to public places that it owns or controls.

3 DISTRIBUTION OF VERTEBRATE PESTS IN THE CITY OF LAKE MACQUARIE

The distribution of vertebrate pests in the City of Lake Macquarie for the purposes of the VPMS is based predominantly on the collation of records from the LMCC GIS database and OEH's Wildlife Atlas records. Records were also obtained from community correspondence records collected by LMCC and through discussions with LMCC staff and government stakeholders.

Vertebrate pest species known or have the potential to establish in the City (as of September 2012) are listed in *Table 1*. This list will be updated annually in Council's State of the Environment Report.

Table 1: Vertebrate pest species known or have the potential to establish in the City of Lake Macquarie.

Class	Scientific Name	Common Name	Pest Status
Amphibian	*Bufo marinus*	Cane Toad	NKTP; SKTP
Mammal	All species	Deer (all species)	SKTP;
	Canis spp	Wild Dog	Declared; SKTP
	Oryctolagus cunniculus	European Rabbit	Declared; NKTP; SKTP
	Lepus capensis	Brown Hare	Uncommon pest
	Felis catus	Cat	NKTP; SKTP
	Vulpes vulpes	European Red Fox	NKTP; SKTP
	Sus scrofa	Feral Pig	Declared; NKTP; SKTP
	Capra hircus	Feral Goat	NKTP; SKTP
Fish	*Cyprinus carpio*	Carp	Common pest
	Gambusia holbrooki	Mosquito Fish	SKTP
Reptile	*Trachemys scripta elegans*	Red-eared Slider Turtle	Emerging
Bird	*Acridotheres tristis*	Common or Indian Myna	Common pest
	Sturrus vulgaris	Common Starling	Common pest
	Streptopelia chinensis	Spotted Turtle Dove	Common pest
	Passer montanus	Eurasian Tree Sparrow	Common pest
	Passer domesticus	House Sparrow	Common pest
	Columba livia	Feral Pigeon	Common pest
	Pycnonotus jocosus	Red-whiskered Bulbul	Uncommon pest
	Carduelis carduelis	European Gold Finch	Uncommon pest
	Anas platyrhynchos	Mallard	Common pest

NKTP – species listed Nationally as a Key Threatening Process (EPBC Act);
SKTP – species listed atState level as a Key Threatening Process (TSC Act);
Declared – species declared as a pest by the Minster for Agriculture under the RLP Act;
Emerging – species that are not yet declared pests under any NSW or federal legislation but have the ability to become a major pest.

4 VERTEBRATE PEST IMPACTS

Each vertebrate pest species in Australia is either known or suspected of causing a range of negative economic, social and/or environmental impacts. However, the process of identifying and quantifying such impacts is often difficult and expensive to undertake. Consequently, no quantative assessment of vertebrate pest impacts across the City has been undertaken.

More detailed information regarding the distribution, impacts and management options for the pests listed in Table 1 and other pest species can be found in other reference documents including the following web pages:

http://www.dpi.nsw.gov.au/agriculture/pests-weeds/vertebrate-pests/general-information/pest-animal-survey

http://www.lhpa.org.au/pests/pest-control-advice

http://www.environment.gov.au/biodiversity/invasive/ferals/index.html

http://www.environment.gov.au/biodiversity/invasive/publications/humane-control.html

http://www.invasiveanimals.com

http://www.environment.nsw.gov.au/threatenedspecies//keythreateningprocessesbydoctype.htm

http://www.feralscan.org.au

5 ISSUES, CHALLENGES & RISKS

With new pests being detected all the time, invasive species represent one of the greatest threats to biodiversity in Australia. Pest species are widely distributed across Australia and many species are increasing in distribution. Pest populations usually have high reproductive capacity, and can both colonise new areas rapidly, and recover quickly after control (OEH 2011).

This situation is further complicated by environmental change, including those associated with climate change, which may affect the ability of pest species to expand their distribution or reproduce in different areas. In addition, new pest species are continually arising, and it is essential to be able to respond to this.

The *NSW Invasive Species Plan* outlines four key goals relating to pest management in NSW. These goals are also relevant to pest management in the City of Lake Macquarie:

- ***Exclude*** - to identify potential new pests to the city, thoroughly assess potential invasiveness and implement effective barriers to prevent their establishment;
- ***Eradicate or contain*** - to develop and deploy effective and efficient ways to eradicate or contain a pest before it becomes widespread;
- ***Effectively manage*** - to manage or control widespread pests to reduce their impact where benefits of control are greatest; and
- ***Capacity*** - to have the knowledge, skills, resources and systems to manage the impacts of pests.

As indicated in the *NSW Invasive Species Plan*, future priorities in pest management will need to reflect changes in the distribution, abundance and impacts of pest species that may occur in response to changing climates.

6 VERTEBRATE PEST MANAGEMENT

Vertebrate pest management in the City of Lake Macquarie is a very complex process. Effective management of vertebrate pests at such a broad scale requires awareness and consideration of the different land uses, various objectives of land management and the diverse nature of biogeographical features throughout the City. The limited resources to implement pest management programs in the City also requires a strategic approach to pest management. Consequently, the VPMS attempts to guide vertebrate pest management by splitting management tasks into two distinct categories:

1. control and management of high priority or declared pest species – addressing the most noxious pest species using specific operational objectives and actions; and
2. City – wide strategic pest management – implementing broader strategic objectives to achieve improved pest management and awareness across the entire City.

The focus of pest management within the VPMS is primarily on vertebrate pest species known to occur in the City. The process for addressing other pest species that could pose either minor or potential threats is discussed briefly in section 6.4.

6.1 VERTEBRATE PEST MANAGEMENT PRINCIPLES

Wherever possible, the VPMS has adopted the pest management principles applied by the NPWS in the formulation of the NPWS Draft Central Coast Hunter Range Regional Pest Management Strategy 2012-2015. These principles aim to ensure that pest management is carried out effectively and efficiently. The following pest management principles are generally applied:

1. **Prevention is better than cure**. Early detection of new pest incursions and rapid response is considered a critical priority as it is the most effective means of reducing the impact and cost of pest management.
2. **Evidence-based decision-making and risk assessments should feature in pest program development**. It is important to demonstrate that planning and prioritisation are based on the best available scientific and technical information. Risk assessments should feature an analysis of feasibility of control and risk of impact.
3. **Widespread pest programs should adopt an asset-based risk management approach.** The aim of most pest control programs is to minimise the adverse impacts of widespread pests for which eradication is not possible. Therefore, a site-led approach should be used for widespread species and management should be targeted to sites where benefits will be greatest. Prioritisation should be based on maintaining important assets and optimising outcomes for asset protection and management.
4. **Pest management should take an integrated approach.** Targeting more than one pest is often important as the control of one species may benefit another.
5. **Outcomes of pest programs must be clear, demonstrable, and measurable.** Setting of clear management objectives is vital for planning, monitoring, evaluation and reporting. Monitoring should be implemented, at appropriate levels, to demonstrate and improve the ongoing effectiveness of

control programs. Control programs should be based on an adaptive management approach to ensure continuous development and improvement based on a framework incorporating monitoring, evaluation, feedback and change.

6. **Pest management requires on-going effort.** For most pests, localised one-off or low frequency control is likely to be ineffective due to the rapid reinvasion or re-establishment of the pest. Therefore, ongoing effort will usually be required for long-term success. Planning for pest programs should consider a realistic assessment of the capacity to maintain adequate effort over the long-term.

7. **A partnership approach should be applied.** Pests occur and move across the landscape irrespective of tenure boundaries. Therefore, to be most effective pest management should be collaborative and coordinated across the landscape.

8. **Adherence to best practice methods.** All vertebrate pest control activities conducted by, or on behalf of LMCC will be conducted in accordance with the Vertebrate Pest Control Manual published by the NSW DPI. All methods will minimise suffering by animals and comply with relevant animal welfare legislation. The use of pesticides will be in accordance with relevant legislation and cause minimal harm to the environment. Notifications will be as described in the LMCC Pesticide Use Notification Plan.

6.2 PRIORITISING PEST SPECIES

6.2.1 Methodology

It is necessary to prioritise the vertebrate pest species as part of the VPMS in order to maximise the effectiveness of available resources. The management of high priority species should be reviewed annually to determine the ongoing or emergent threat of the various pest species.

The process used in the VPMS for prioritising pest species is based on the principles of the NSW Invasive Species Plan and the Pestplan methodology (Braysher & Saunders, 2003). Wollongong City Council (2012) has adopted a similar decision-making framework. The rationale is based on ranking pest species according to a combination of pest significance and the feasibility of control measures.

Pest significance refers to the level of social, economic and environmental impact of a pest. A quarter of the score is focussed on the impacts on Council land so that Council prioritises managing pests directly impacting on its land and associated services. The final scores are allocated to four significance categories: Low; Moderate; High; and Very High (refer to *Appendix B: Table B1 and Appendix C: Section 1.0 for significance parameters*).

Pest control feasibility refers to the cost of control, current population levels, risk involved in control, and the likelihood that control could eliminate the pest problem. The final scores are allocated to four control feasibility categories: prevent, eradicate, reduce and contain (refer to *Appendix B: Table B2 and Appendix C: Section 2.0 for feasibility parameters*).

Council has allocated a score for each of these factors based on the input from Council staff, GIS data, and from residents. The pest priority matrix provided below in Table 2 was used to allocate the vertebrate pest species in three categories: Low,

Medium, or High, based on the combined scores for significance and control feasibility. Using the matrix, high priority species include all species that scored very high in the significance assessment and/or scored very high in the control feasibility assessment. See Appendix C for the priority assessment for select pest species known to occur, or have the potential to establish within the City.

Table 2: Pest priority matrix

	Pest Significance			
Control feasibility	Low	Moderate	High	Very High
Very High (Prevent)	High	High	High	High
High (Eradicate)	Medium	Medium	Medium	High
Moderate (Reduce)	Low	Low	Medium	High
Low (Contain)	Low	Low	Low	High

The resulting prioritisation of pest species has identified two high priority vertebrate pest species in the City (Table 3). There are currently no reported populations of either the Red-eared Slider Turtle or Cane Toad in the City; however, populations have been sighted in neighbouring local government areas in recent years, which poses a potential risk to the biodiversity of Lake Macquarie. Specific management actions for each high priority pest species are provided in the following Priority Pest Plans (PPP). PPP have also been prepared for all pest species declared under the *Rural Lands Protection Act 1998* that are known to occur in the City.

Table 3: Control priority of vertebrate pest species in the City of Lake Macquarie

PEST SPECIES	PEST SIGNIFICANCE	CONTROL FEASIBILITY	CONTROL PRIORITY
Red Eared Slider Turtle	High	Prevent	High
Cane Toad	High	Prevent	High
Fox	High	Reduce	Medium
Wild Dog	Moderate	Eradicate	Medium
Rabbit	High	Reduce	Medium
Feral Pig	Moderate	Eradicate	Medium
Common or Indian Myna Bird	Moderate	Reduce	Low
Carp	Moderate	Reduce	Low

6.2.2 Priority Pest Plans

A Priority Pest Plan (PPP) will be prepared for each high priority or declared vertebrate pest species. Each PPP consists of 11 sections:

- trigger for action – reasons to initiate pest management;

- key stakeholders – parties responsible or interested in the management of this particular pest species in the City;
- consultation approach – methodologies used to keep stakeholders informed about the implementation of this PPP;
- pest status – identifies the pest status of each species at the State and National level;
- distribution in LGA – identifies the known and potential distribution of the pest species within the City of Lake Macquarie;
- available control techniques – lists of all approved techniques suitable for the control of each pest species;
- operational objectives – the objective of control is directly related to the level of control feasibility identified in the priority process;
- operational actions – the actions recommended to control the pest species
- responsibility – lists the party/s responsible for ensuring the action is carried out
- measure of success – potential methods for monitoring the effectiveness of the operational actions
- timeframe – when the operational action will be completed; and
- status – progress in implementing the operational action.

Priority Pest Plans for high priority vertebrate pest species are contained within Appendix D.

6.3 CITY-WIDE VERTEBRATE PEST MANAGEMENT

A series of broad-scale vertebrate pest management actions have been formulated to address five strategic management objectives for the City. The strategic objectives and associated management actions are provided in Table 4, along with a priority ranking and an indication of lead responsibility.

Table 4: City-Wide vertebrate pest management objectives and actions

Strategic Objective	Management Action	Priority	Lead Responsibility	Supporting Dept/s	Availability of Staff Resources	Availability of Operational Resources
Community Education/Awareness	• Update existing pest webpage on the LMCC website to include information on High Priority Pest Species; impacts, methods of control, awareness of new pests, and links to other relevant websites.	High	SUST	WER	a	NR
	• Develop and distribute education material at regular events and in response to enquiries.	Med	SUST/WER	AM/CP/CSC	a	c
	• Raise awareness about FeralScan website.	Med	SUST/WER	CS&C	a	NR
	• Respond to community enquiries regarding vertebrate pest management.	High	CS&C	AM/CP	a	NR
LMCC Staff Education/Awareness	• Review and update vertebrate pest management FAQ's on Council's Intranet system	High	WER	SUST/CS&C	a	NR
	• Professional development for key staff.	Med	WER		b	NR
	• Establish Invasive Species Management Committee to annually review the implementation of the Strategy.	Med	SUST	WER/AM/CP/ PM	a	NR
	• Establish procedure for responding to					

	new pest incursions.	High	WER	SUST	a	NR
Data Collation/Research	• Encourage members of the community, sporting field operating committees, tourist park managers and LMCC staff to record pest species sightings, impacts and control on Feralscan website.	Med	WER	CSC/CP/AM, CIV/ PROP/SUST	a	NR
	• Review and update problem codes on Oracle's CRM system to enable vertebrate pest enquiries to be captured and queried.	Med	SUST	AM/CP/CS&C	a	NR
	• Continue to support research on vertebrate pest species in LMCC and keep informed on the release of new research findings on the control of vertebrate pest species.	Med	SUST	WER/AM	b	NR
	• Conduct pest impact assessments and monitor the implementation of programs.	Med	WER	AM/CP/PROP	b	c
Stakeholder Communication	• LMCC to maintain regular contact with Cumberland Livestock Health & Pest Authority on matters pertaining to pest management.	Med	WER		a	NR
	• Where feasible, LMCC should endeavour to participate in coordinated pest control programs with other agencies.	High	WER	AM/CP	b	c
Resources	• Seek external funding to implement	High	AM/CP/PD	SUST	b	NR

	pest management programs. • Continue to support community actions to minimise the impacts of pests. • Quantify and annually review expenditure on pest control programs.	Med High	SUST/AM Invasive Species Management Committee		a a	NR NR
Operations	• Implementation of Priority Pest Plans • Investigate the practicality of implementing a residential vertebrate pest trapping program for private property	High Med	WER WER	SUST/AM/CP/ PROP	b	c

a = sufficient resources available

b = some resources available, additional resources required

c = no resources available, additional resources required

NR = no resources required

6.4 NEW AND EMERGING PEST SPECIES

New pest species continue to establish in the environment either through importation of new species into Australia or the escape of domestic animals. Prevention and early detection followed by eradication is the most cost-effective way to minimise the impacts of new pests.

Consequently, LMCC needs to work closely with other agencies to help prevent the introduction of new pests into the environment and to respond rapidly when new incursions occur.

6.5 IMPLEMENTATION OF THE VPMS

Implementation of the VPMS will require a committed and coordinated approach along with ongoing funding to implement both the strategic City-wide management actions and operational actions.

6.5.1 Invasive Species Management Committee

An Invasive Species Management Committee is required to oversee the implementation of the VPMS by providing technical and strategic guidance for actions arising from the strategy, liaising with external stakeholders and to monitor, evaluate and report on the strategy. Representation on the Committee and charter for the operation of the Invasive Species Management Committee will be developed within the first six months of the strategy.

6.5.2 Actions

There are two different types of strategic action plans requiring implementation – City-wide pest management actions (Section 6.3), and individual priority pest plans (Section 6.2.2 & Appendix D) for each high priority or declared vertebrate pest species.

It is intended that actions identified within the City-wide pest management plan will be implemented over the six year period of the VPMS, with high priority actions implemented within the first 12 months.

Operational actions identified in the individual priority pest plans will be implemented during 2013-14 and evaluated at the conclusion of this period.

6.5.3 Funding/Resources

Short-term control programs are not effective at reducing pest populations given the highly mobile and rapid reproductive characteristics of pest species. Therefore, all on-ground operations that have been identified as part of the individual priority pest plans, although cost effective, will require further resources for monitoring and follow-up-works to maintain reduced pest population levels.

The majority of actions identified within the City-wide pest management plan (Section 6.3) may be carried out as part of existing programs and projects. However, to enhance these existing programs and projects, additional allocation of staff resources will be required to allow these actions to be implemented.

Invasive species management is seasonal within a given financial year, with sometimes marked differences in pest activity during different financial years. In addition, much of the on-ground work involving monitoring and managing invasive species must occur outside of ordinary working hours. The additional expenses associated with this type of seasonal or intermittent work need to be provided as an

increase in budgets to implement this VPMS and to maintain pest populations at appropriate levels.

Incursions of high priority new pest species will require adaptive management and an increase in resources to address any such incursion. Currently Cane Toads and Red Eared Slider Turtles are listed as high priority potential new incursions. If an outbreak were detected, it is likely that costs of monitoring and management would be shared with external agencies.

At present, it is not possible to calculate annual expenditure on pest management actions. In the past there has been no budget specifically allocated for vertebrate pest management and the cost to carry out pest control actions were funded from the budget of the Council department responsible for the management of the asset being protected. To gain a better understanding of the cost to Council to control vertebrate pest on Council owned and managed land it is proposed to establish a specific project number for use across Council for vertebrate pest management. Pest management expenditure will then be used as a guide in projecting future budget requests for pest management in the City.

Funding for pest management actions can also be sought externally through programs such as Caring for our Country – an Australian Government initiative that funds environmental management activities. The HCRCMA also offers funding assistance through their Communities Caring for Catchments programs to undertake projects that deliver on the targets of the Hunter-Central Rivers Catchment Action Plan.

6.6 VPMS REVIEW

The management actions contained within the VPMS should be reviewed every 12 months in order to reconsider their relevance, as part of ESAP review process. Section 1.4 and Appendix A of the VPMS, relating to legislative requirements, should also be reviewed every 12 months to ensure compliance with any additions or changes to Commonwealth and State legislations. Any necessary changes to the VPMS should be addressed in a supplementary version.

The entire VPMS should be reviewed every five years in order to assess the progress of the recommended actions, update or add management actions where appropriate, incorporate additional information and ensure the VPMS remains relevant to LMCC management aims and objectives.

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APPENDIX A: RELEVANT LEGISLATION

ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) aims to protect the environment at a national level by addressing seven Matters of Environmental Significance, which include:

- World Heritage properties;
- National heritage places;
- wetlands of international importance (Ramsar wetlands);
- threatened species and ecological communities;
- migratory species;
- Commonwealth marine areas;
- nuclear actions.

It also attempts to streamline the national environmental assessment and approvals process, protect Australian biodiversity and integrate management of important natural and cultural places.

The objectives of the EPBC Act are:

- to provide for the protection of the environment, especially those aspects of the environment that are matters of national environmental significance;
- to promote ecologically sustainable development through the conservation and ecologically sustainable use of natural resources;
- to promote the conservation of biodiversity;
- to provide for the protection and conservation of heritage;
- to promote a co-operative approach to the protection and management of the environment involving governments, the community, land-holders and indigenous peoples;
- to assist in the co-operative implementation of Australia's international environmental responsibilities;
- to recognise the role of indigenous people in the conservation and ecologically sustainable use of Australia's biodiversity; and
- to promote the use of indigenous peoples' knowledge of biodiversity with the involvement of, and in co-operation with, the owners of the knowledge.

The EPBC Act also provides for the listing of Key Threatening Processes (KTP) and the preparation of Threat Abatement Plans (TAP). KTPs currently listed on the Act relevant to vertebrate pest management in the City of Lake Macquarie include:

- competition and land degradation by unmanaged goats;
- competition and land degradation by rabbits;
- predation by European fox;
- predation by feral cats;
- predation, habitat degradation, competition and disease transmission by feral pigs;

- the biological effects, including lethal toxic ingestion, caused by cane toads *(Bufo marinus).*

With the exception of cane toads, TAPs have been prepared for the above-mentioned KTPs, and are relevant to vertebrate pest management in the City of Lake Macquarie.

THREATENED SPECIES CONSERVATION ACT 1995

The *Threatened Species Conservation Act 1995* (TSC Act) provides for the listing of threatened species, populations and ecological communities in NSW. It makes provision for the preparation and implementation of recovery plans for threatened species and the designation of areas as habitat critical to the survival of threatened species, populations and ecological communities. The objectives of the Act are:

- to conserve biological diversity and promote ecologically sustainable development;
- to prevent the extinction and promote the recovery of threatened species, populations and ecological communities;
- to protect the critical habitat of those threatened species, populations and ecological communities that are endangered;
- to eliminate or manage certain processes that threaten the survival or evolutionary development of threatened species, populations and ecological communities;
- to ensure that the impact of any action affecting threatened species, populations and ecological communities is properly assessed; and
- to encourage the conservation of threatened species, populations and ecological communities by the adoption of measures involving co-operative management.

The Act also provides for the listing of KTPs and the preparation of TAPs. Recovery plans and TAPs relevant to vertebrate pest management in the Lake Macquarie LGA are discussed below.

Threat Abatement Plans

Threat abatement plans (TAPs) have been finalised for the following key threatening processes that are relevant to vertebrate pest management in the Lake Macquarie LGA:

- **Predation by the red fox *(Vulpes vulpes) December 2001*** - This plan outlines the impacts of foxes on native animals and sets out the management actions that are necessary to abate this threat.
- **Predation by *Gambusia holbrooki* (Plague minnow) August 2003** - This plan outlines the impacts of the introduced fish *Gambusia holbrooki* on native animals, particularly threatened frogs, and sets out the management actions that are necessary to abate this threat.

Recovery Plans

The TSC Act requires that a recovery plan be prepared for each species listed as either vulnerable or endangered on Schedules 1 and 2 of the Act. Lake Macquarie City Council must consider the content of Recovery Plans when preparing plans of

management for community land under the *Local Government Act 1993*. Therefore, relevant recovery plans need to be considered by LMCC during the preparation of the Vertebrate Pest Management Strategy.

Recovery Plans relevant to terrestrial vertebrate pest management in the Lake Macquarie LGA include:

- Koala – Approved Recovery Plan (November 2008)
- Barking Owl – draft Recovery Plan (February 2003)
- Little Tern – Recovery Plan (October 2003)
- Green & Golden Bell Frog – draft Recovery Plan (February 2005)
- Magenta Lilly Pilly - draft Recovery Plan
- Yellow-bellied Glider - Recovery Plan February 2003
- Large Forest Owl – Recovery Plan May 2005
- Brush-tailed Rock Wallaby – Recovery Plan March 2008
- Bushstone Curlew – Recovery Plan February 2006
- Red Goshawk – Recovery Plan October 2006

Threatened Species Priorities Action Statement

The Threatened Species Priorities Action Statement (PAS) was published in September 2007. It outlines the broad strategies and detailed priority actions to be undertaken in NSW to:

- promote the recovery of threatened species, populations and ecological communities; and
- manage key threatening processes.

The PAS also explains ways in which Catchment Management Authorities, Local Councils, environmental and community groups and the public can implement the PAS, and ways in which its success will be measured and monitored.

NATIONAL PARKS AND WILDLIFE ACT 1974

Under Section 98 (2) of the *National Parks and Wildlife Act 1974* (NPW Act), a person shall not:

(a) harm any protected fauna; or

(a1) harm for sporting or recreational purposes game birds that are locally unprotected fauna; or

(b) use any substance, animal, firearm, explosive, net, trap, hunting device or instrument or means whatever for the purpose of harming any protected fauna.

Consequently, the LMCC must ensure that no protected fauna species, as listed in the NPW Act, are harmed as a result of undertaking pest management activities.

ENVIRONMENTAL PLANNING & ASSESSMENT ACT 1979

The *Environmental Planning and Assessment Act 1979* (EPA Act) does not specifically legislate for the consideration of pest management as part of the development application and approval process. It does however provide a number of possible mechanisms for the assessment of the environmental impact of development and other works through Sections 79C and 111, as well as via subordinate legislation, including State Environmental Planning Policies (see below). These assessments must be considered in light of the objects of the EPA Act and there are three specific objects that relate to environmental protection and management under which pest management is a key consideration:

> *5 Objects* (inter alia)*:*
>
> > *(i) the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment,*
> >
> > *(vi) the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats,*
> >
> > *(vii) ecologically sustainable development...*

LOCAL GOVERNMENT ACT 1993

Division 2, Section 35 of the Local Government Act 1993 (LG Act) requires that community land be used and managed in accordance with a Plan of Management applying to the land. Sections 36E to 36N of Division 2 specify the core objectives for managing the various types of community land. Therefore, the objectives and actions contained within the VPMS need to be consistent with the core management objectives for each type of community land.

RURAL LANDS PROTECTION ACT 1998 (RLP Act)

The *Rural Lands Protection Act 1998* (RLP Act) provides for the protection of rural lands. Under the RLP Act, landholders have a duty to fully and continuously suppress and destroy, by any lawful method, all animals on their land that have been declared as pests in a Pest Control Order. Pest Control Orders are made by the Minister for Agriculture, and may declare any animal in the animal kingdom (except humans) as a pest and describe any land to which the order applies. Vertebrate species currently declared as pests in the Lake Macquarie LGA by the Minister for Agriculture are rabbits, feral pigs and wild dogs.

GAME AND FERAL ANIMAL CONTROL ACT 2002

The primary aim of the *Game and Feral Animal Control Act 2002* is to promote responsible and orderly hunting of game animals and certain pest animals. The public lands that are covered by this Act do not include any areas currently managed by LMCC.

COMPANION ANIMALS ACT 1998

The aim of the *Companion Animals Act 1998* is to provide for the effective and responsible care and management of companion animals. Section 6A(1) of the Act requires councils to promote awareness within its area of the requirements of the Act with respect to the ownership of companion animals.

PESTICIDES ACT 1978

This Act regulates the sale, supply, use, possession and application of pesticides in NSW. The Act also regulates the possession, mixing and use of 1080 (sodium mono fluroacetate). A pesticide order under the Act specifically controls the use and disposal of 1080 used for wild dog control.

PREVENTION OF CRUELTY TO ANIMALS ACT 1979

The aim of the *Prevention of Cruelty to Animals Act 1979* is to prevent cruelty to animals, and to promote the welfare of animals by requiring a person in charge of an animal:

> (i) to provide care for the animal, and
>
> (ii) to treat the animal in a humane manner, and
>
> (iii) to ensure the welfare of the animal.

Part 2, Section 5 of the Act states that a person shall not commit or authorise the commission of an act of cruelty upon an animal. Furthermore, a person in charge of an animal shall not fail at any time:

> (a) to exercise reasonable care, control or supervision of an animal to prevent the commission of an act of cruelty upon the animal,
>
> (b) where pain is being inflicted upon the animal, to take such reasonable steps as are necessary to alleviate the pain, or
>
> (c) where it is necessary for the animal to be provided with veterinary treatment, whether or not over a period of time, to provide it with that treatment.

Consequently, all vertebrate pest control activities conducted by Council or on behalf of Council will be conducted in accordance with the relevant sections of the *Prevention of Cruelty to Animals Act 1979*.

WORK HEALTH & SAFETY ACT 2011

The objectives of the *Work Health & Safety Act 2011* are as follows:

(1) The main objective of this Act is to provide for a balanced and nationally consistent framework to secure the health and safety of workers and workplaces by:

a) protecting workers and other persons against harm to their health, safety and welfare through the elimination or minimisation of risks arising from work or from specified types of substances or plant;

b) providing for fair and effective workplace representation, consultation, co-operation and issue resolution in relation to work health and safety,

c) encouraging unions and employer organisations to take a constructive role in promoting improvements in work health and safety practices, and assisting persons conducting businesses or undertakings and workers to achieve a healthier and safer working environment;

d) promoting the provision of advice, information, education and training in relation to work health and safety;

e) securing compliance with this Act through effective and appropriate compliance and enforcement measures;

f) ensuring appropriate scrutiny and review of actions taken by persons exercising powers and performing functions under this Act;

g) providing a framework for continuous improvement and progressively higher standards of work health and safety, and

h) maintaining and strengthening the national harmonisation of laws relating to work health and safety and to facilitate a consistent national approach to work health and safety in this jurisdiction.

Consequently, LMCC must ensure the health, safety and welfare at work of all staff and contractors undertaking pest management activities. Furthermore, LMCC must ensure that people (other than LMCC staff) are not exposed to risks to their health or safety arising from the conduct of the persons undertaking pest management activities.

FIREARMS ACT 1996

The *Firearms Act 1996* aims to improve public safety by imposing strict controls on the possession, use and storage of firearms. It also aims to facilitate a national approach to the control of firearms.

The Act requires each person who possesses or uses a firearm under the authority of a license to prove a genuine reason for possessing or using the firearm. Vertebrate pest animal control is considered to be a genuine reason under the Act. The person in possession of the firearm must be:

(a) a professional contract shooter engaged or employed in controlling vertebrate pest animals on rural land, or

(b) a person employed by or in, or authorised by, a government agency prescribed by the regulations that has functions relating to the control or suppression of vertebrate pest animals, or

(c) a person whose occupation is the business of a primary producer, or who is the owner, leasee or manager of land used for primary production, and who is participating in an authorised campaign conducted by or on behalf of a government agency or public authority to eradicate large feral animals or animals that are affected by brucellosis or tuberculosis.

APPENDIX B: PRIORITISING PEST SPECIES

Table B1: Pest Significance Ranking

Pest Species	Impact on Council	Economic Impact	Social Impact	Environmental Impact	Total	Rank
Rabbit	3	2	2	2	9	High
Carp	1	2	1	2	6	Moderate
Indian Myna Bird	1	1	1	2	5	Moderate
Fox	3	1	1	2	7	High
Feral Pig	3	1	1	1	6	Moderate
Wild Dog	3	1	1	1	6	Moderate
Red Eared Slider Turtle	2	1	1	3	7	High
Cane Toad	3	1	1	3	8	High

1-3 = Low; 4-6 = Moderate; 7-9 =High; 10-12 = Very High

Table B2: Pest Control Feasibility

Pest Species	Control Cost	Control Risk	Pest Distribution	Likelihood of Success	Total	Rank
Rabbit	2	2	1	2	7	Reduce
Carp	1	2	2	1	6	Reduce
Indian Myna Bird	3	2	1	1	7	Reduce
Fox	2	2	1	1	6	Reduce
Feral Pig	1	1	3	3	8	Eradicate
Wild Dog	1	1	3	3	8	Eradicate
Red Eared Slider Turtle	2	3	3	3	11	Prevent
Cane Toad	2	3	3	3	11	Prevent

1-4 = Contain; 5-7 = Reduce; 8-9 = Eradicate; 10-12 = Prevent

APPENDIX C: PEST SPECIES PRIORITY ASSESSMENT

Priority Pest Species 2012

Factors considered in determining priority Pest Species

Lake Macquarie City Council has adapted this method for prioritising pest species from that employed by Wollongong City Council. It is based on the principles of the NSW Invasive Species Plan and the Pestplan guidelines.

LMCC Pest Prioritisation

The initial assessment is based on the input of Council staff, as well as information available through Council's Customer Relationship Management (CRM) system. The rationale for determining scores is described below.

The method is based on a matrix of pest significance and pest control feasibility.

Table 1: Pest priority matrix

	Pest Significance			
Control feasibility	Low	Moderate	High	Very High
Very High (Prevent)	High	High	High	High
High (Eradicate)	Medium	Medium	Medium	High
Moderate (Reduce)	Low	Low	Medium	High
Low (Contain)	Low	Low	Low	High

1.0 Significance

The significance of a pest is estimated based on its social, economic and environmental impact. A quarter of the score is focussed on Council's legislative responsibilities as a landholder and the associated risks. This is to ensure Council prioritises managing pests directly impacting on its land or services, as well as meeting legislative requirements.

Impacts on Council

Score	Description
1	Not declared or emerging, or not NKTP or SKTP (can be common or uncommon)
2	New occurrences, or emerging pests
3	Declared, NKTP, SKTP

(see Table 1 for status of vertebrate pest species know or likely to occur in the Lake Macquarie LGA)

Economic Impact

Score	Description
1	Minor economic impact on land or assets within the City of Lake Macquarie LGA ($0 - $10,000).
2	Moderate economic impact on land or assets within the City of Lake Macquarie ($10,000 - $50,000)
3	Major economic impact on land or assets within the City of Lake Macquarie (> $50,000)

Social Impact

Score	Description
1	Minor social impact on communities within the City of Lake Macquarie (nuisance)
2	Moderate social impact on communities within the City of Lake Macquarie (inhibits the intended use).
3	Major social impact on communities within the City of Lake Macquarie (prevents the intended use).

Environmental Impact

Score	Description
1	Minor environmental impact on land within the City of Lake Macquarie.
2	Moderate environmental impact on land within the City of Lake Macquarie.
3	Major environmental impact on land within the City of Lake Macquarie. Potentially or irreversible impacts.

Aggregate Score for Significance

Aggregate Score	Rank
10-12	Very High
7-9	High
4-6	Moderate
1-3	Low

2.0 Control Feasibility

Cost of Control

Cost of control is calculated on the basis of known control methods for each species.

Score	Description
1	Professional contractor implementation.
2	Controls implemented by LMCC staff or volunteer labour (existing resources)
3	Community based measures such as behaviour modification.

Risks Associated with Control

Risks are calculated as risks to the community in terms of people, property and the environment, and the risk to the reputation of Lake Macquarie City Council.

	Severity			
Likelihood	Low	Moderate	High	Extreme
Rare	Low	Low	Moderate	High
Unlikely	Low	Low	Moderate	High
Possible	Low	Moderate	Moderate	High
Likely	Low	High	High	Extreme

Score	Category	Description
0	Extreme Risk	Likely to lead to unacceptable outcome eg. Possibility of death, injury, irreversible environmental damage.
1	High Risk	Likelihood of severe injury of operators. Possibility of irreversible environmental damage. Possibility of major loss of reputation for Council.
2	Moderate Risk	Methods mitigate risks to an acceptable level eg. Appropriate risk assessments and controls employed.
3	Low Risk	Methods have an acceptable level of risk associated with implementation.

Current Distribution of Pests

Score	Description
1	Widely distributed throughout the City, or generally found associated with a landscape type eg. Coastal dunes
2	Distributed in small identifiable patches or found to occur over a small extent of the City.
3	Only recently detected. Occurring over an isolated area of the City.

Likelihood That Control Will Be Effective

Score	Description
1	Unlikely that control methods will be effective in reducing the impact of the pest species.
2	Possibility that control methods will be effective in reducing the impact of the pest species.
3	Likely that control methods will be effective in reducing the impact of the pest species.

Aggregate Score for Feasibility

Aggregate Score	Rank
10-12	Prevent
8-9	Eradicate
5-7	Reduce
1-4	Contain

Rabbit

SIGNIFICANCE

Rabbit	Score	Description
Council Impact	3	Rabbits regularly impact on Council land including natural areas, playing fields, cemeteries and Tourist Parks. Rabbits are a Declared pest, NKTP, SKTP. Risk of not controlling is to breach control order.
Economic	2	Rabbits regularly cause moderate damage to Council property through digging and herbivory.
Social	2	Rabbits decrease the amenity of some areas by reducing vegetation cover and defecation as well as creating hazardous holes in the ground.
Environmental	2	Rabbits are listed as a Key Threatening Process under the TCS Act. Known to eat revegetation plantings.
TOTAL	9	
Rank	**High**	

FEASIBILITY

Rabbit	Score	Description
Control Cost	2	Chemical, habitat management and monitoring by Council resources.
Control Risk	2	Adherence to Code of Practice, Standard Operating Procedure, Pesticide Use Notification Plan. Pest & Weed Work Method Statement/Risk Assessment, and all relevant legislation
Pest Distribution	1	Rabbits are widely distributed throughout Australia and cover about 60% of the continent. Rabbits are widely distributed throughout the Lake Macquarie LGA.
Likelihood of Success	2	Some possibility that ongoing control methods will reduce population to lower levels reducing frequency of continuing control. Success is increased when integrated control methods are used.
TOTAL	7	
Rank	**Reduce**	

	Pest Significance			
Control feasibility	Low	Moderate	High	Very High
Very High (Prevent)	High	High	High	High
High (Eradicate)	Medium	Medium	Medium	High
Moderate (Reduce)	Low	Low	Medium	High
Low (Contain)	Low	Low	Low	High

Priority Assessment: Medium

Carp

SIGNIFICANCE

Carp	Score	Description
Council Impact	1	Recorded impacts of Carp causing foreshore erosion in SQIDs. Common pest.
Economic	2	Moderate costs associated with maintaining SQID foreshore areas.
Social	1	Some members of the public enjoy fishing for Carp.
Environmental	2	Carp are contained within SQIDs. Likely to be competing with native freshwater fish for food. Turbidity caused from carp feeding habits likely to be detrimental to native fish species.
TOTAL	6	
Rank	**Moderate**	

FEASIBILITY

Carp	Score	Description
Control Cost	1	Control would have to involve the use of contractor. Cost of Carp control methods likely to be high.
Control Risk	2	Risks can be managed by risk assessments.
Pest Distribution	2	Carp occupy most of the southeast Australian mainland, with isolated populations in Tasmania and Western Australia. Only Northern Territory is free of carp. Carp are contained within a small number of SQIDs in LGA.
Likelihood of Success	1	Unlikely that control program will be effective in reducing the impact of the species.
TOTAL	6	
Rank	**Reduce**	

	Pest Significance			
Control feasibility	Low	Moderate	High	Very High
Very High (Prevent)	High	High	High	High
High (Eradicate)	Medium	Medium	Medium	High
Moderate (Reduce)	Low	Low	Medium	High
Low (Contain)	Low	Low	Low	High

Priority Assessment: Low

Indian Myna Bird

SIGNIFICANCE

Indian Myna Bird	Score	Description
Council Impact	1	Some reports of birds defecating on Council buildings, nesting in buildings, and roosting in trees causing noise complaints. Common pest.
Economic	1	Minor economic costs associated with defecation clean up and lice infestation.
Social	1	Residents dislike Indian Myna birds.
Environmental	2	Moderate impacts through competition with native birds.
TOTAL	5	
Rank	**Moderate**	

FEASIBILITY

Indian Myna Bird	Score	Description
Control Cost	3	Residents can undertake actions to reduce breeding and feeding opportunities.
Control Risk	2	Animal welfare standards would need to be followed. Poorly executed Myna control is a risk to Council. If the program has appropriate controls, this risk could be reduced.
Pest Distribution	1	Indian Mynas are distributed throughout eastern Australia from western Victoria in the south, to Cairns in the north. They have also been recently spotted in Perth, Adelaide and Tasmania. Indian Mynas are widely distributed throughout the Lake Macquarie LGA.
Likelihood of Success	1	The level of establishment and resources required makes it unlikely that control would be effective. There is some chance of reduced local impacts.
TOTAL	7	
Rank	**Reduce**	

	Pest Significance			
Control feasibility	Low	Moderate	High	Very High
Very High (Prevent)	High	High	High	High
High (Eradicate)	Medium	Medium	Medium	High
Moderate (Reduce)	Low	Low	Medium	High
Low (Contain)	Low	Low	Low	High

Priority Assessment: Low

Fox

SIGNIFICANCE

Fox	Score	Description
Council Impact	3	No reported impacts. NKTP & SKTP.
Economic	1	Some recorded impacts on backyard livestock.
Social	1	Residents complain of foxes taking chickens and environmental impacts.
Environmental	2	Impacting on fauna and spreading weeds such as Bitou Bush and Blackberry, but not known to what extent. Listed as Key Threatening Process under TSC Act.
TOTAL	7	
Rank	**High**	

FEASIBILITY

Fox	Score	Description
Control Cost	2	Cage trapping likely to be most effective control method in LGA. Trained staff able to undertake this method of control. Habitat management and monitoring by Council resources also required.
Control Risk	2	Appropriate signage and adherence to trapping guidelines should reduce risks.
Pest Distribution	1	Foxes have spread across 76% of the continent, except the far tropical north. The fox has recently been introduced to Tasmania. Foxes are likely to be widely distributed in the Lake Macquarie LGA. Not known.
Likelihood of Success	1	Control measures are unlikely to be effective due to range and cryptic nature of animals.
TOTAL	6	
Rank	**Reduce**	

	Pest Significance			
Control feasibility	Low	Moderate	High	Very High
Very High (Prevent)	High	High	High	High
High (Eradicate)	Medium	Medium	Medium	High
Moderate (Reduce)	Low	Low	Medium	High
Low (Contain)	Low	Low	Low	High

Priority Assessment: Medium

Feral Pig

SIGNIFICANCE

Feral Pig	Score	Description
Council Impact	3	No reported impacts. Likely to be impacting on flora & fauna, but no direct evidence. Pigs are a Declared pest, NKTP, SKTP. Risk of not controlling is to breach control order.
Economic	1	No recorded economic impact on Council land or assets.
Social	1	Wild pigs are likely to attract illegal hunting.
Environmental	1	Likely to be some minor impact on flora & fauna. Not known to what extent.
TOTAL	6	
Rank	**Moderate**	

FEASIBILITY

Feral Pig	Score	Description
Control Cost	1	Control would have to involve the use of contractors as well as habitat management and monitoring by Council resources.
Control Risk	1	High risk to operator due to firearms, traps and pigs.
Pest Distribution	3	Feral pigs are spread across about half of the continent, from western Victoria, through New South Wales into Queensland, and across northern Australia. The extent of feral pigs in the Lake Macquarie LGA is largely unknown. Few sightings reported.
Likelihood of Success	3	Control measures may be locally effective.
TOTAL	8	
Rank	**Eradicate**	

	Pest Significance			
Control feasibility	Low	Moderate	High	Very High
Very High (Prevent)	High	High	High	High
High (Eradicate)	Medium	Medium	Medium	High
Moderate (Reduce)	Low	Low	Medium	High
Low (Contain)	Low	Low	Low	High

Priority Assessment: Medium

Wild Dog

SIGNIFICANCE

Wild Dog	Score	Description
Council Impact	3	No confirmed sightings. Wild dogs are a Declared pest, SKTP. Risk of not controlling is to breach control order.
Economic	1	No recorded economic impact on Council land or assets.
Social	1	Wild dogs are likely to attract illegal hunting.
Environmental	1	Likely to be minor impact on fauna. Not known to what extent.
TOTAL	6	
Rank	**Moderate**	

FEASIBILITY

Wild Dog	Score	Description
Control Cost	1	Control would have to involve the use of contractors as well as habitat management and monitoring by Council resources.
Control Risk	1	High risk to operator due to firearms and traps.
Pest Distribution	3	Extent is largely unknown. Few unconfirmed sightings reported.
Likelihood of Success	3	Control measures may be locally effective.
TOTAL	8	
Rank	**Eradicate**	

	Pest Significance			
Control feasibility	Low	Moderate	High	Very High
Very High (Prevent)	High	High	High	High
High (Eradicate)	Medium	Medium	Medium	High
Moderate (Reduce)	Low	Low	Medium	High
Low (Contain)	Low	Low	Low	High

Priority Assessment: Medium

Red Eared Slider Turtle

SIGNIFICANCE

Red-eared Slider Turtle	Score	Description
Council Impact	2	No reported impacts. Emerging pest.
Economic	1	No recorded economic impact on Council land or assets
Social	1	No impact on residents however, can inflict painful bite.
Environmental	3	If found in LGA the Red-eared slider turtle has potential to cause major environmental impact on native turtles.
TOTAL	7	
Rank	**High**	

FEASIBILITY

Red-eared Slider Turtle	Score	Description
Control Cost	2	Costs likely to be minimal as NPWS likely to undertake control. Ongoing monitoring by Council resources.
Control Risk	3	Low risk as control likely to only involve isolated incursions.
Pest Distribution	3	Popular pet industry species. No reported sightings in Lake Macquarie LGA. Recent sightings in Sydney and Central Coast.
Likelihood of Success	3	Likely that control method will be successful.
TOTAL	11	
Rank	**Prevent**	

	Pest Significance			
Control feasibility	Low	Moderate	High	Very High
Very High (Prevent)	High	High	High	High
High (Eradicate)	Medium	Medium	Medium	High
Moderate (Reduce)	Low	Low	Medium	High
Low (Contain)	Low	Low	Low	High

Priority Assessment: High

Cane Toad

SIGNIFICANCE

Cane Toad	Score	Description
Council Impact	3	No reported impacts. SKTP & NKTP.
Economic	1	No recorded economic impact on Council land or assets
Social	1	No impact on communities.
Environmental	3	If found in LGA the Cane toad has the potential to cause a major threat to native fauna and pets such as cats and dogs.
TOTAL	8	
Rank	**High**	

FEASIBILITY

Cane Toad	Score	Description
Control Cost	2	Costs likely to be minimal as NPWS likely to undertake control. Ongoing monitoring by Council resources.
Control Risk	3	Low risk as control likely to only involve isolated species.
Pest Distribution	3	Isolated sightings in Lake Macquarie LGA. They are slowly spreading southward from QLD into NSW. A breeding population has been recorded at Port Macquarie.
Likelihood of Success	3	Likely that control method will be successful if the incursion is found early.
TOTAL	11	
Rank	**Prevent**	

	Pest Significance			
Control feasibility	Low	Moderate	High	Very High
Very High (Prevent)	High	High	High	High
High (Eradicate)	Medium	Medium	Medium	High
Moderate (Reduce)	Low	Low	Medium	High
Low (Contain)	Low	Low	Low	High

Priority Assessment: High

APPENDIX D: PRIORITY PEST PLANS

Priority Pest Management Plan - Rabbit

Pest Management Plan 2012 – 3013 - Rabbit

Trigger for Action

- Statutory obligation to continually suppress and control rabbits
- Risk of public injury from rabbit damage
- Degradation of natural areas from rabbit activity
- Damage to community assets from rabbit grazing and burrowing

Key Stakeholders

- Livestock Health & Pest Authority
- Council land managers
- Affected residents
- Sporting clubs
- Landcare groups
- Other government land managers

Consultation Approach

- Residents will be notified of rabbit control involving poisons according to the guidelines of the *Pesticide Act 1999*.
- Residents will have access to information on rabbit management through Council's Customer Service Section and on Council's website. Information will be in the form of frequently asked questions.
- Residents will be encouraged to record rabbit sightings on RabbitScan. RabbitScan is a community website developed by the NSW Government that allows residents to map and record sightings of rabbits, the damage they are causing, and control activities in their local area.
- Council will consult with the Cumberland Livestock Health and Pest Authority regarding rabbit control measures and strategies.

Pest Status

Rabbits are a declared pest under the *Rural Lands Protection Act 1998*. This means that Council is obliged to eradicate wild rabbits by any lawful means on Council managed land. If Council does not do this, they can be issued with an order to do so from the Cumberland Livestock Health and Pest Authority (CLHPA).

Competition and grazing by the feral European Rabbit is listed as a Key Threatening Process under the *Threatened Species Conservation Act 1995*.

Distribution in LGA

Rabbits occur extensively throughout the Lake Macquarie Local Government Area. In particular, coastal zone area.

Available Control Techniques

Table 1: Humaneness, Efficacy, Cost-effectiveness and Target Specificity of Rabbit Control Methods (adapted from model Code of Practice for the Humane Control Of Rabbits, *NSW DPI, 2004a)*

Control Technique	Acceptability of technique with regard to humanness*	Efficacy	Cost-effectiveness	Target Specificity	Comments
Fertility control	Conditionally acceptable	Unknown	Unknown	Depends on agent used	No products currently registered.
Exclusion fencing	Acceptable	Limited	Expensive	Can be in certain situations	Useful in high value locations and conservation areas. Only applicable to small areas.
Ground baiting with 1080	Conditionally acceptable	Effective	Relatively expensive	Potential risk of poisoning non-target animals	**Not appropriate for urban, semi-rural and urban areas of Lake Macquarie LGA.
Aerial baiting with 1080	Conditionally acceptable	Effective	Expense	Potential risk of poisoning non-target animals	**Not appropriate for urban, semi-rural and urban/residential areas of Lake Macquarie LGA.

Pindone baiting	Only acceptable when there is no other alternative	Effective	Cost-effective (compared to 1080)	Potential risk of poisoning non-target animals	Highly suitable for use in controlled urban areas. Should only be used in areas where it's impractical or unsuitable to use 1080 baiting.
Pressure fumigation of warrens using chloropicrin	Not acceptable	Effective	Expensive	Non-target wildlife using warrens are vulnerable	Inhumane and should not be used. Alternatives are available.
Diffusion fumigation or warrens using phosphine	Conditionally acceptable only when rabbit populations are low	Variable	Relatively Expensive	Non-target wildlife using warrens are vulnerable	Warren is not destroyed therefore it can be easily recolonised. Unsuitable for large areas.
Warren destruction by ripping	Conditionally acceptable only when rabbit populations are low	Effective	Cost-effective	Non-target wildlife using warrens are vulnerable	Where warrens are the principal shelter for rabbits, ripping is the most cost-effective and most long-lasting method of control. Cannot be used in accessible, rocky or environmentally sensitive areas.
Warren destruction using explosives	Conditionally acceptable only when rabbit populations are low	Effective	Relatively expensive (compared to ripping)	Non-target wildlife using warrens are vulnerable	Provides long term management of rabbit populations. Requires trained and licensed operators and adherence to strict OH&S requirements. Effective in inaccessible and rocky areas.
Treatment of rabbit warrens using LPG technology (Rid-a-Rabbit®)	Has not been assessed, thought to be inhumane	Unknown	Unknown	Non-target wildlife using warrens are vulnerable	Labour intensive. Warren is not destroyed therefore it can be easily recolonised. Unsuitable for large areas.
Ground shooting	Acceptable	Not effective	Not cost-effective	Target specific	Time consuming and labour intensive, only suitable for small scale operations. Not suitable in certain situations eg. Where dense cover is available, inaccessible or rough terrain, near human habitation.

Biological control with RHDV	Conditionally acceptable	Variable	Cost-effective	Target specific	Effectiveness depends on habitat. RHDV outbreaks should be followed up with conventional control methods to achieve more long-term control of rabbit populations.
Biological control with myxomatosis	Depends upon strain. Highly virulent strain will kill rabbits quickly.	Unpredictable effectiveness. Has become less effective overtime	Cost-effective	Target specific	This is a self-disseminating virus that is already widespread in the environment. It is not routinely used as a control technique though natural outbreaks should be followed up with conventional control methods to achieve more long-term control of rabbit populations.
Soft-jawed traps	Conditionally acceptable	Not effective	Not cost-effective	Risk of catching non-target animals	Occasionally used in areas with small isolated rabbit populations but are inefficient for general control.
Steel-jawed traps	**Not acceptable**	Not effective	**Inhumane and should not be used** **Alternatives are available**	Risk of catching and causing severe injury and distress to non-target animals	**Not acceptable**

*Acceptable methods are those that are humane when used correctly.
*Conditionally acceptable methods are those that, by the nature of the technique, may not be consistently humane. There may be a period of poor welfare before death.
*Methods that are not acceptable are considered to be inhumane. The welfare of the animals is very poor before death, often for a prolonged period.
**Advice of the Livestock Health and Pest Authority.

Council Approach to Rabbit Control

When selecting sites for rabbit control, Lake Macquarie City Council prioritises the minimisation of rabbit impacts on high value infrastructure such as playing fields,buildings and biodiversity impacts on endangered ecological communities and revegetation sites. Council also looks to minimise safety risks posed by rabbits digging near pathways. Council considers the level of damage present at a site, the level of risk posed by the damage and the feasibility of control using the Rabbit Density Index (developed by Livestock Health and Pest Authority NSW). From this assessment, control sites are determined.

Operational Objectives

Reduce – decrease rabbit numbers in key locations to reduce impacts on Council land, residents and natural areas.

Objective	Location	Timeframe
Reduce rabbit generated ruts on playing surfaces	Council managed playing fields	As required
Reduce rabbit damage to revegetation areas	Council managed revegetation areas	As required
Reduce rabbit damage to Council Tourist Parks	Council managed Tourist Parks	As required
Provide management advice to residents	City-wide	As required
Reduce trip hazards from rabbit ruts	Council managed land	As required
Reduce damage caused by undermining on public open spaces and infrastructures eg burrowing under graves in cemeteries	Council managed land	As required
Gain a better understanding of the distribution of rabbits in Lake Macquarie LGA	City-wide	On-going

Operational Actions

Operational Action	Responsibility	Measure of Success	Timeframe	Status
Reduce harbour for rabbits within Council Tourist Parks	LMCC/Private Park Managers	Caravan parks implement rabbit exclusion fencing under caravans	As required	
Erect mesh fencing around revegetated areas in known rabbit populated areas	AM	Damage to vegetation reduced	As required	
Implement control programs on Council managed lands assessed as ‘high’ using the Rabbit Density Index, to reduce ruts and trip hazards	CP/AM/WER	Reduced population of rabbits and reduction in ruts and burrows.	As required	

Undertake infill or topdressing of ruts and burrows on Council managed land assessed as 'high' using the Rabbit Density Index	CP/Grounds Committee/AM/ Council Maintenance Crews	Reduction in ruts and burrows on all surfaces	As required	
Undertake infill or topdressing of ruts and burrows on Council managed land assessed as 'low/medium' using the Rabbit Density Index	CP/Grounds Committee/AM/ Council Maintenance Crews	Reduction in ruts and burrows on all surfaces	As required	
Reduce excessive harbourage surrounding areas of high population density eg surrounds of playing fields	CP/AM/WER	Reduced population of rabbits	As required	
Create a tool incorporating social, economic and environmental impacts and rabbit density to assess the extent of control required	AM/CP/Sust/WER	Assessment tool created	December 2012	
Mapping undertaken when inspections and control programs implemented	WER	Information recorded by Council and maps produced.	As required	

Priority Pest Management Plan – Red-Eared Slider Turtle

Pest Management Plan 2012 – 2013 – Red-Eared Slider Turtle

Trigger for Action

- Suspected sighting of Red Eared Slider Turtle

Key Stakeholders

- NSW National Parks & Wildlife Service
- NSW Department Primary Industries - Fisheries
- Waterwatch groups
- Society of Frogs and Reptiles
- Hunter Central Rivers Catchment Management Authority

Consultation Approach

- Information to assist residents and Council staff to identify the Red Eared Slider Turtle will be available on Council's website.
- Any suspected sightings of the Red Eared Slider Turtle in waterways are to be reported to NSW National Parks & Wildlife Service immediately.
- Any suspected sightings of the Red Eared Slider Turtle sold in shops/ found in fish hatcheries are to be reported to NSW Department Primary Industries – Fisheries.
- Any sightings should be reported as soon as possible to bio-security authorities. The national hotline is 1800 084 881.

Available Control Techniques

Control Technique	Acceptability of technique with regards to humaneness	Efficacy	Cost-effectiveness	Target Specificity	Comments
Stunning/decapitation/destruction of the brain	Acceptable	Effective	Inexpensive	Target specific	
Shooting	Acceptable	Effective	Not cost-effective	Target specific	Contractor required to carry out. Other methods of control more suitable.
Overdose of barbiturate	Acceptable	Effective	Not cost-effective	Target specific	Can be administered by local vets.

(Source: NSW DPI, 2004b)

Pest Status

The Red-eared slider turtle is listed globally as one of the world's worst invaders and pose a serious threat to aquatic biodiversity. It is illegal to keep or sell Red-eared slider turtles in NSW without an authority and heavy fines or imprisonment can apply to unlawful activities.

Distribution in LGA

There have been no confirmed sightings of Red-eared slider turtles in the Lake Macquarie LGA. However, there have been sightings of red-eared slider turtles in neighbouring local government areas.

Operational Objective

Prevent – the early detection of the Red-eared slider turtle is of critical priority to prevent the risk of this invasive species establishing in the Lake Macquarie LGA.

Objective	Location	Timeframe
To raise awareness about the threat of Red-eared slider turtles.	City-wide	Ongoing
To prevent the Red-eared slider turtle from establishing a breeding population in the Lake Macquarie LGA.	City-wide	Ongoing
To keep a record of confirmed sightings of Red-eared slider turtles in the Lake Macquarie LGA.	City-wide	On-going

Operational Actions

Operational Action	Responsibility	Measure of Success	Timeframe
Include information on Council's website about the Red-eared slider turtle eg: identification, threats, contacts to report sightings.	Sust	Information available on Council's website	Dec 2012
Develop a procedure on how to respond to new pest incursions.	Sust/WER	Procedure developed and distributed to Council staff	Jan 2013
Record sightings of the Red-eared slider turtle in the Lake Macquarie LGA on Council GIS.	WER	Sighting recorded on GIS	As required
Train outdoor staff working in drainage, SQID's and wetlands on how to identify a red-eared slider turtle and who to report it to.	WER	Suspected sightings identified and reported	Mar 2013

Priority Pest Management Plan – Cane Toad

Pest Management Plan 2012 – 2013 – Cane Toad

Trigger for Action

- Suspected sighting of cane toad

Key Stakeholders

- NSW National Parks & Wildlife Service
- NSW Department Primary Industries - Fisheries
- Society of Frogs & Reptiles
- Council land managers
- Hunter Central Rivers Catchment Management Authority

Consultation Approach

- Information to assist residents and Council staff to identify cane toads will be available on Council's website.
- Any suspected sightings of the cane toads in waterways are to be reported to NSW National Parks & Wildlife Service immediately.
- Any suspected sightings of the cane toads sold in shops/ found in fish hatcheries are to be reported to NSW Department Primary Industries – Fisheries
- Any sightings should be reported as soon as possible to bio-security authorities. The national hotline is 1800 084 881.
- Residents will be encouraged to record cane toad sightings on ToadScan. ToadScan is a community website developed by the NSW Government that allows residents to map and record sightings of cane toads, the damage they are causing, and control activities in their local area.

Available Control Techniques

Table 1: Humaneness, Efficacy, Cost-effectiveness and Target Specificity of Cane Toad Euthanasia Methods (from the Standard Operating Procedure specific to field euthanasia of cane toads, *NSW DPI, 2011)*

Control Technique	Acceptability of technique with regards to humaneness	Efficacy	Cost-effectiveness	Target Specificity	Comments
Stunning followed by decapitation	Conditionally acceptable	Effective	Cost-effective	Target-specific when only cane toads are targeted	Impractical for large-scale application. Best used for individuals or low numbers of animals. Must be done against solid surface with large head hammer and sharp knife. Humane and effective when performed by confident and skilled operators using the correct equipment and technique.
Carbon dioxide	Conditionally acceptable	Effective	Cost-effective	Target-specific when only cane toads are targeted	Practical and cost-effective for large scale use. Exposure to CO2 must be for minimum of 4 hours exposure to 90% (or greater) concentration of CO2 and no more than 20 animals per bag. All animals must be confirmed dead prior to disposal of carcasses.
Hopstop®	Conditionally acceptable	Effective	Relatively expensive	Target-specific when only cane toads are targeted	Behavioral observations of treated toads indicate that there may be a period of suffering prior to death however this is likely to be only for a short period (2-3 minutes) until the toads becomes sedated or anaesthetised. Best used for individuals or low numbers of animals. Has the potential to be practical for large-scale use, however may not be cost-effective.

Pest Status

The invasion and establishment of the Cane Toad is listed as a Key Threatening Process under the State *Threatened Species Conservation Act 1995,* and the biological effects, including lethal toxic ingestion, caused by Cane Toads is listed as a federal Key Threatening Process under the *Environment Protection and Biodiversity Conservation Act 1999.*

Distribution in LGA

There have been a few isolated sightings of Cane Toads in the Lake Macquarie LGA in the last number of years.

Operational Objective

Prevent – the early detection of the cane toads is of critical priority to prevent the risk of this invasive species establishing in the Lake Macquarie LGA.

Objective	Location	Timeframe
To raise awareness about the threat of Cane Toads.	City-wide	Dec 2012
To prevent Cane Toads from establishing a breeding population in the Lake Macquarie LGA.	City-wide	Ongoing
To keep a record of confirmed sightings of Cane toads in the Lake Macquarie LGA.	City-wide	Ongoing

Operational Actions

Operational Action	Responsibility	Measure of Success	Timeframe
Include information on Council's website about Cane Toads eg: identification, threats, contacts to report sightings.	Sust	Information available on Council's website	Dec 2012
Develop a procedure on how to respond to new pest incursions.	Sust/WER	Procedure developed and distributed to Council staff	Jan 2013
Record sightings of Cane toads in the Lake Macquarie LGA on Council GIS.	WER	Sighting recorded on GIS	As required

Train outdoor staff working in drainage, SQIDs and wetlands on how to identify a cane toad and who to report it to.	WER	Suspected sightings identified and reported	Mar 2013

Priority Pest Management Plan – Feral Pig

Pest Management Plan 2012 – 2013 –

Trigger for Action

- Suspected sighting of feral pigs
- Statutory obligation to continually suppress and control feral pigs
- Risk of public injury from feral pigs damage
- Degradation of natural areas from feral pigs activity
- Damage to community assets from feral pig grazing and digging

Key Stakeholders

- Livestock Health & Pest Authority
- Council land managers
- Affected residents
- Landcare groups
- Other government land managers

Consultation Approach

- Residents will have access to information on feral pig management through Council's Customer Service Section and on Council's website. Information will be in the form of frequently asked questions.
- Residents will be encouraged to record feral pig sightings on PigScan. PigScan is a community website developed by the NSW Government that allows residents to map and record sightings of feral pigs, the damage they are causing, and control activities in their local area.
- Council will consult with the Cumberland Livestock Health and Pest Authority regarding feral pig control measures and strategies.

Available Control Techniques

Table 1: Humaneness, Efficacy, Cost-effectiveness and Target Specificity of Feral Pig Control Methods (adapted from model Code of Practice for the Humane Control Of Feral Pigs, *NSW DPI, 2004c)*

Control Technique	Acceptability of technique with regards to humaneness	Efficacy	Cost-effectiveness	Target Specificity	Comments
Exclusion fencing	Acceptable	Limited	Expensive	Can be in certain situations	Fencing can be effective for small, critical (economically or environmentally) areas, though the maintenance cost are high.
Ground baiting with 1080	Conditionally acceptable	Effective	Cost-effective	Relatively large amounts of 1080 are required to kill pigs; therefore there is a significant potential risk of poisoning non-target animals. Strategic ground baiting uses fewer baits than aerial baiting programs. Uneaten baits can be collected and destroyed.	Currently the most cost-effective technique available. 1080 ingestion can also kill non-target animals including native species, cats, dogs and livestock. 1080 is toxic to humans; operators need to take precautions to safeguard against exposure.
Aerial baiting with 1080	Conditionally acceptable	Effective	Cost-effective	Relatively large amounts of 1080 are required to kill pigs; therefore there is a significant potential risk of poisoning non-target animals. Uneaten baits cannot be collected.	Effective for broad scale control in remote areas. 1080 ingestion can also kill non-target animals including native species, cats, dogs and livestock. 1080 is toxic to humans; operators need to take precautions to safeguard against exposure.

				Dried meat baits remain toxic for longer periods than fresh meat.	
Ground shooting	Conditionally acceptable	Not effective	Not cost - effective	Target specific	Labour intensive, only suitable for smaller scale operations.
Aerial Shooting	Conditionally acceptable	Effective	Relatively expensive. Can be cost-effective when pig density is high	Target specific	Provides high level medium- to long-term control of feral pig populations
Trapping	Acceptable	Can be in certain situations	Can be in certain situations	May catch non-target animals	Important control technique in areas where baiting or aerial shooting is not possible.

*Acceptable methods are those that are humane when used correctly.
*Conditionally acceptable methods are those that, by the nature of the technique, may not be consistently humane. There may be a period of poor welfare before death.
*Methods that are not acceptable are considered to be inhumane. The welfare of the animal is very poor before death, often for a prolonged period.

Pest Status

Feral pigs are a declared pest under the *Rural Lands Protection Act 1998*. This means that Council is obliged to eradicate feral pigs by any lawful means on Council managed land. If Council does not do this, they can be issued with an order to do so from the Cumberland Livestock Health and Pest Authority (CLHPA).

Predation, habitat degradation, competition and disease transmission by feral pigs is listed as a Key Threatening Process under the State *Threatened Species Conservation Act 1995* and Federal *Environmental Protection and Biodiversity Conservation Act 1999.*

Distribution in LGA

There have been no confirmed sightings of feral pigs in the Lake Macquarie LGA. However, there have been sightings of feral pigs in neighbouring local government areas.

Operational Objective

Eradicate – to deploy effective and efficient ways to eradicate or contain feral pigs before they become widespread within Lake Macquarie LGA.

Objective	Location	Timeframe
To raise awareness about the threat of feral pigs.	City-wide	Dec 2012
To prevent feral pigs from establishing a breeding population in the Lake Macquarie LGA.	City-wide	Ongoing
To keep a record of confirmed sightings of feral pigs in the Lake Macquarie LGA.	City-wide	Ongoing

Operational Actions

Operational Action	Responsibility	Measure of Success	Timeframe
Include information on Council's website about feral pigs eg: identification, threats, contacts to report sightings.	Sust	Information available on Council's website	Dec 2012
Develop a procedure on how to respond to new pest incursions.	Sust/WER	Procedure developed and distributed to Council staff	Jan 2013

Record sightings of feral pigs in the Lake Macquarie LGA on Council GIS.	WER	Sighting recorded on GIS	As required
Report any suspected sightings of feral pigs to CLHPA.	WER	Feral pigs sightings reported	As required

Priority Pest Management Plan – Wild Dog

Pest Management Plan 2012 – 2013 –

Trigger for Action

- Suspected sighting of wild dogs
- Statutory obligation to continually suppress and control wild dogs

Key Stakeholders

- Livestock Health & Pest Authority
- Council land managers
- Affected residents
- Other government land managers

Consultation Approach

- Residents will have access to information on wild dog management through Council's Customer Service Section and on Council's website. Information will be in the form of frequently asked questions.
- Residents will be encouraged to record wild dog sightings on WildDogScan. WildDogScan is a community website developed by the NSW Government that allows residents to map and record sightings of wild dogs, the damage they are causing, and control activities in their local area.
- Council will consult with the Cumberland Livestock Health and Pest Authority regarding wild dog control measures and strategies.

Available Control Techniques

Table 1: Humaneness, Efficacy, Cost-effectiveness and Target Specificity of Wild Dog Control Methods (adapted from model Code of Practice for the Humane Control Of Wild Dogs, *NSW DPI, 2004d)*

Control Technique	Acceptability of technique with regards to humaneness*	Efficacy	Cost-effectiveness	Target Specificity	Comments
Exclusion fencing	Acceptable	Effective in suitable areas	Expensive	Can be in certain situations	Well designed and maintained netting and electric barrier fences can be useful in excluding dogs from sheep-grazing areas. Expensive, therefore impractical for large scale application.
Guard animals (e.g. dogs, alpacas, llamas, donkeys)	Acceptable	Unknown	Unknown	Guard dogs may chase or attack non-target animals e.g. native wildlife, pet dogs, livestock	Likely to be only effective for small to medium enterprises.
Ground baiting with 1080	Conditionally acceptable	Effective	Cost-effective	Potential risk of poisoning non-target animals. Strategic ground baiting uses fewer baits than aerial baiting programs. Uneaten baits can be collected and destroyed.	Currently the most cost-effective technique available. 1080 ingestion can also kill non-target animals including native species, cats, dogs and livestock. 1080 is toxic to humans; operators need to take precautions to safeguard against exposure.
Aerial baiting with 1080	Conditionally acceptable	Effective	Cost-effective	Potential risk of poisoning non-target animals. Uneaten baits cannot be collected. Dried meat baits remain toxic for longer periods than fresh meat.	Effective for broad scale control in remote areas. 1080 ingestion can also kill non-target animals including native species, cats, dogs and livestock. 1080 is toxic to humans; operators need to take precautions to safeguard against exposure.

Steel-jawed traps	**Not acceptable**	Not effective	**Inhumane and should not be used** **Alternatives are available**	Risk of catching and causing severe injury and distress to non-target animals	**Not acceptable**
Ground shooting	Acceptable	Not effective	Expensive	Target specific	Labour intensive, not appropriate for reducing populations over extensive areas. Often an opportunistic method of control.
Cage traps	Acceptable	Not effective	Expensive	May catch non-target animals but they can usually be released unharmed	Useful only in urban areas for problem animals
Eco-traps®	Acceptable	Not effective	Expensive	May catch non-target animals but they can usually be released unharmed	May be useful in urban areas for problem animals, where baiting is inappropriate or where live-capture is required for research purposes.
Padded-jaw traps	Conditionally acceptable	Can be effective in certain situations	Expensive	Risk of catching non-target animals but they can usually be released unharmed. Some species may experience severe injuries.	May be useful for problem animals but are inefficient for general control. Effectiveness depends on skill of operator. Easier to use than treadle snares.
Treadle snares	Conditionally acceptable	Can be effective in certain situations	Expensive	Risk of catching non-target animals but they can usually be released unharmed. Some species may experience severe injuries.	May be useful for problem animals but are inefficient for general control. Can be difficult to set and are bulky to carry.

*Acceptable methods are those that are humane when used correctly.
*Conditionally acceptable methods are those that, by the nature of the technique, may not be consistently humane. There may be a period of poor welfare before death.
*Methods that are not acceptable are considered to be inhumane. The welfare of the animal is very poor before death, often for a prolonged period.

Pest Status

Wild dogs are a declared pest under the *Rural Lands Protection Act 1998*. This means that Council is obliged to eradicate wild dogs by any lawful means on Council managed land. If Council does not do this they can be issued with an order to do so from the Cumberland Livestock Health and Pest Authority (CLHPA).

Predation and Hybridization by feral dogs is listed as a Key Threatening Process under the *Threatened Species Conservation Act 1995*.

Distribution in LGA

There have been no confirmed sightings of wild dogs in the Lake Macquarie LGA. However, there have been sightings of wild dogs in neighbouring local government areas.

Operational Objective

Eradicate – to deploy effective and efficient ways to eradicate or contain wild dogs before they become widespread within Lake Macquarie LGA.

Objective	Location	Timeframe
To raise awareness about the threat of wild dogs.	City-wide	Dec 2012
To prevent wild dogs from establishing a breeding population in the Lake Macquarie LGA.	City-wide	Ongoing
To keep a record of confirmed sightings of wild dogs in the Lake Macquarie LGA.	City-wide	Ongoing

Operational Actions

Operational Action	Responsibility	Measure of Success	Timeframe
Include information on Council's website about wild dogs eg: identification, threats, contacts to report sightings.	Sust	Information available on Council's website	Dec 2012
Develop a procedure on how to respond to new pest incursions.	Sust/WER	Procedure developed and distributed to Council staff	Jan 2013
Record sightings of wild dogs in the Lake Macquarie LGA on Council GIS.	WER	Sighting recorded on GIS	As required

Report any suspected sightings of wild dogs to CLHPA	WER	Wild dog sightings reported	As required