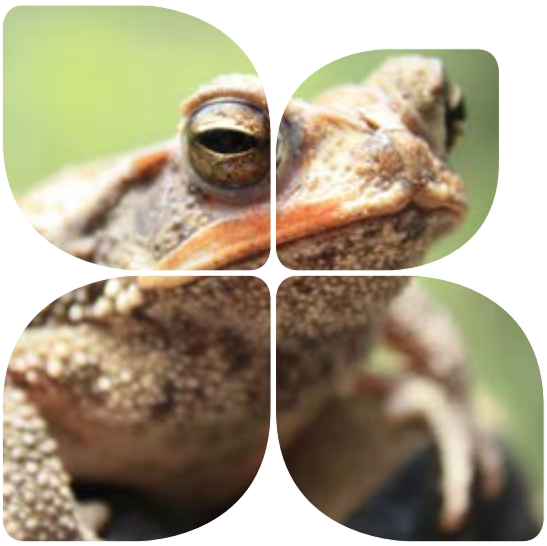
North Coast Regional Strategic Pest Animal Management Plan 2018 - 2023

NSW GOVERNMENT



Published by North Coast Local Land Services

North Coast Regional Strategic Pest Animal Management Plan 2018-2023

First published June 2018. www.lls.nsw.gov.au/northcoast

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

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

Contents

Minister's Foreword

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

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

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

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

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

Executive summary

Why do we need this plan?

Biosecurity is vital for the health, wellbeing and prosperity of everyone in the North Coast region. The purpose of the North Coast Regional Pest Animal Management Plan is to protect the economy, environment and community, through strategic management of the region's pest animals.

On the North Coast, pest animals have a significant impact on primary production, peri-urban and rural communities, and threatened species and ecological communities. Wild Dog attacks on livestock and pets, lethal or not, cause emotional distress to land managers and threaten human health, safety and wellbeing. Pest animals like wild dogs and feral pigs are vectors for disease, and cane toads, foxes and cats have a big impact on our native fauna. Deer and wild horses cause production and environmental damage and have become a significant risk to human safety, with numerous road accidents in recent years.

A pest means different things to different people, depending on the impact an animal has on their livelihood, lifestyle or wellbeing and their beliefs about an animal's presence and behaviour. A problem animal for some may be an unknown problem or desirable resource to another. These differing views have contributed in part to some pest animals increasing in number and extent across the region. Along with increasing urbanisation (especially on the coast) and agricultural landuse, more communities are being affected by pest animals.

What is the plan about?

This plan outlines how Government, industry and the community can work together and share the responsibility to prevent, eradicate, contain or manage pest animals to achieve a balance in economic, environmental and social outcomes. The plan aims to:

- reduce the impact of pest animals on public safety, primary production and biodiversity
- prioritise activities and improve systems that support pest management (reporting, surveillance, etc.)
- support implementation of the *Biosecurity Act 2015*, by:
  - ◊ providing clarity on how land managers can meet their obligations
  - ◊ making it easier for land managers to participate in managing biosecurity
  - ◊ guiding development of coordinated, cooperative, tenure neutral local pest management plans.

The intensity and mix of land uses in the region makes a tenure neutral and co-ordinated approach essential for effective pest management. The region also borders three other LLS/NRM regions, making cross regional collaboration essential for prevention and effective pest management.

What should I do?

This plan provides information for all land managers on priority pest species, what is expected of all land managers in managing these pest species, and what the strategic actions to manage them are. It's important that land managers participate in coordinated programs, stay informed and undertake activities that reduce risks from pest animals, on land under their care and control.

Alert Species are those which present a threat to the region, but aren't known to be present in the region. These are also listed. Land managers and community members can stop these species from becoming established by reporting anything unusual or suspicious as soon as possible.

The priority pest species addressed in the plan are listed below in alphabetical order.

- Cane Toad
- Feral Cat
- Wild Deer - *Red Deer, Hog Deer, Sambar Deer, Chital, Rusa Deer, Fallow Deer*
- European Red Fox
- Feral Goat
- Wild Horse
- Indian Myna
- Feral Pig
- Wild Rabbit
- Wild Dog
- Alert species - *Cane Toad, Red-eared slider turtle, Red Imported Fire Ant, Big Headed Ant, Indian Ring-necked Parrot.*

Who will implement the plan?

The North Coast Regional Pest Animal Committee will provide strategic oversight of pest management at a regional level. The Committee will be supported by North Coast LLS to monitor the implementation of the plan, and the development of local plans that manage priority pest issues across the region. The Committee will also play an important role in coordination of cross-tenure and cross-agency pest programs.

This plan provides the overall strategic direction for managing pest animals in the region, with local Wild Dog management plans and other local operational pest plans determining the programs implemented in a given year.

Key stakeholders and the community will work together to bring a balanced approach to implementation. Partnerships with local government and community groups will be especially important in managing pest species in the rural and peri urban environments and improving public safety.

1. Introduction

1.1 Overview

The North Coast Regional Strategic Pest Animal Management Plan outlines how Government, industry and the community can work together and share the responsibility to prevent, eradicate, contain or manage pest animals in terrestrial and aquatic environments across the region.

The economic impact of wild rabbits, carp, pigs, foxes, dogs, goats and introduced birds has been estimated at $170 million in NSW.

Sharing the responsibility of biosecurity across the landscape increases the outcomes of effective control (increased effectiveness to reduce costs). Without coordinated and combined efforts, the level of effort to achieve the same outcome will significantly increase.

Under the *Biosecurity Act 2015*, all community members have a general biosecurity duty to prevent, minimise or eliminate any biosecurity risk. The general biosecurity duty is a principle that can be used by the community, land managers, Government and industry to implement best practice behaviours to achieve effective pest animal management.

1.2 Purpose of the plan

The overall purpose of the Regional Strategic Pest Animal Management Plan is to work together to protect the environment, community and economy from the negative impacts of pest animals to support positive outcomes for biosecurity and sustainable landscapes. The plan supports regional implementation of the *Biosecurity Act 2015* and NSW Biosecurity Strategy 2013-2021 and is reflects key themes, including:

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

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

Regional Strategic Pest Animal Management Plans will provide guidance on how both public and private land managers can meet their general biosecurity duty and identify key commitments for pest animal management activities over the life of this plan.

Local pest management plans will outline the activities that all land managers can undertake to reduce risks from local pest populations on land under their care and control.

This plan is a living document that will continue to be revised in light of new perspectives on the management of pest animals in NSW.

1.3 What is considered a pest animal?

Under the *Biosecurity Act 2015*, pest animals are not defined by species. Pest species can be considered as any species (other than native species) that present a biosecurity threat.

Whilst the Act does not define pest animals, there are specific activities that are permitted under the Biosecurity Order (Permitted Activities) that would otherwise be prohibited (such as keeping exotic animals in captivity).

It is the responsibility of individuals to ensure they discharge their general biosecurity duty to manage the biosecurity risks posed by pest animals. The *Biosecurity Regulation 2017* outlines mandatory measures for pest animal management in NSW. The general pest animal control and management approaches outlined in this plan allow

individuals to discharge their general biosecurity duty. Land managers and community members will work with stakeholders to ensure ongoing implementation of pest animal management practices.

1.4 Managing native animals

Native species are protected by law in NSW and are not covered in this plan. Issues associated with managing the impacts of native species (such as kangaroos, corellas, flying foxes and possums) should be addressed separately in consultation with National Parks and Wildlife Service and having regard to the regulatory requirements of the *Biodiversity Conservation Act 2016*.

Non-lethal methods may include exclusion netting, fencing, gating, and olfactory devices. Where it is necessary to use lethal methods such as shooting to destroy native animals because they are a threat to human safety, damaging property and/or causing economic hardship, the National Parks and Wildlife Service can issue a biodiversity conservation licence to harm protected native animals under the *Biodiversity Conservation Act 2016*.

For further information visit http://www.environment.nsw.gov.au/wildlifelicences/OccupierLicences.htm

1.5 Framework for pest animals

The North Coast Pest Plan is part of an extensive planning framework for biosecurity in Australia. The relationship of this plan to the State and National framework for pest animal biosecurity management is shown in Figure 1.1.

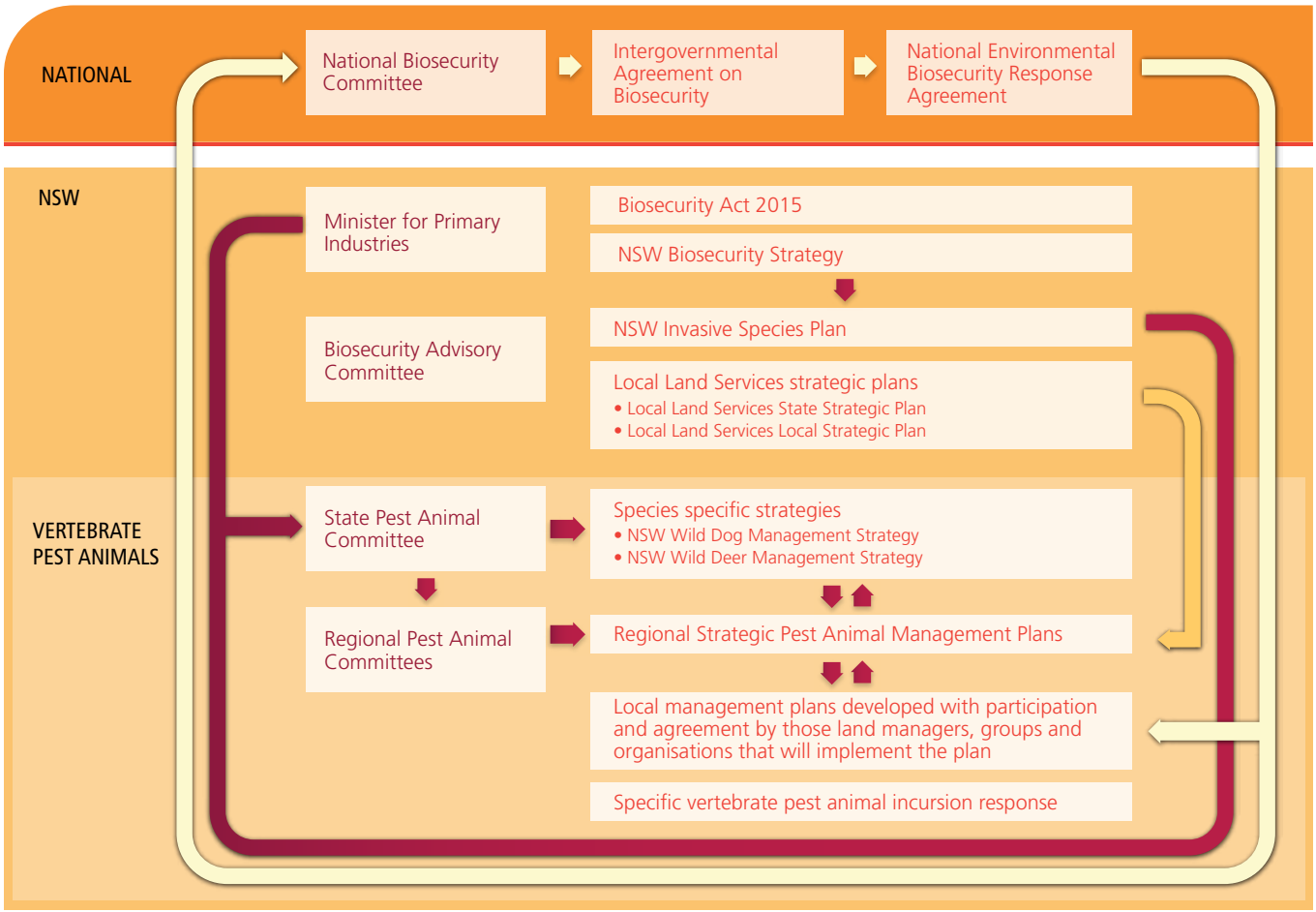


Figure 1.1. The NSW Biosecurity framework for invasive species in NSW.

1.6 Roles and responsibilities

The following outlines the role of the Regional and State Pest Animal Committee in the delivery of the Regional Strategic Pest Animal Management Plan.

State Pest Animal Committee

The State Pest Animal Committee is responsible for overseeing a consistent approach to the ongoing operation of Regional Pest Animal Committees (RPAC) and development of tenure neutral Regional Strategic Pest Animal Management Plans across the State. The Committee oversee key policy and strategy documents to guide pest animal management outcomes across the State.

Regional Pest Animal Committees

Regional Pest Animal Committees facilitate tenure neutral strategic planning and coordination for priority pest animal management programs in each Local Land Services (LLS) region. Committees have an important role to play in the delivery of the Regional Strategic Pest Animal Management Plans through promoting land manager and general community involvement in detecting and reporting sightings of new or 'unusual' animals in the local area as well as managing established pest animals. More detail of Committee roles is provided in Section 5.14.

For more information on land manager roles and responsibilities in pest animal management, please refer to the Invasive Species Plan 2017-2021.

1.7 Incursion management and Alert Species

Alert species are those that are not known to be present in an area and which represent a significant threat. Working together is critical to ensuring early detection, awareness and the swift and effective management of alert species incursions. It is important the community remain vigilant and report any unusual (i.e., animals or signs of animal presence) sightings to ensure a rapid management response.

The *Biosecurity Act 2015* outlines species that are prohibited from being kept in NSW.

Land managers and community members play a major role in reporting any unusual sightings of pest animals (e.g., direct sightings, signs of presence, impacts) in the region. The Alert Species addressed by this plan (see Figure 1.2) include:

- Cane Toad
- Red-eared Slider Turtle
- Red Imported Fire Ant
- Big Headed Ant
- Indian Ring-necked Parrot.

To report an unusual situation in the region:

- complete the Report an Unusual Animal Sighting Form or;
- phone the NSW DPI Invasive Plants and Animals Enquiry Line, ph: 1800 680 244 or;
- email invasive.species@dpi.nsw.gov.au.

For species that are yet to become widely established in NSW, the initial response to incursion reports is managed through consultation between NSW Dept of Primary Industries (DPI), LLS and Office of Environment and Heritage (OEH). Where species are widely established in NSW but have spread into a new region, LLS and the Regional Pest Animal Committee will consider whether local eradication or containment should be attempted.

Cane Toad

Red-eared Slider Turtle

Red Imported Fire Ant

Big Headed Ant

Indian Ring-necked Parrot

Figure 1.2. The Alert Species addressed by this plan.

2. Guiding principles of pest animal management

The following principles will guide the development of all local pest animal management strategies, plans and actions.

They will be considered and implemented by all community, industry, land managers and other stakeholders involved in pest animal management.

Be alert

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

Work together and participate

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

Be committed

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

Stay up-to-date

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

3. Our region

The North Coast Local Land Services Region is located in north-eastern NSW, includes Lord Howe Island, and covers an area of 32,051 km^2 (Figure 3.1). The Region supports a diverse and distinct mixture of landscape, livelihood, lifestyle and cultural values (North Coast LLS 2016a).

Pest animals impose significant costs to these values across region. They adversely affect agricultural productivity, access to export markets, public health and amenity, tourism and the conservation of biodiversity.

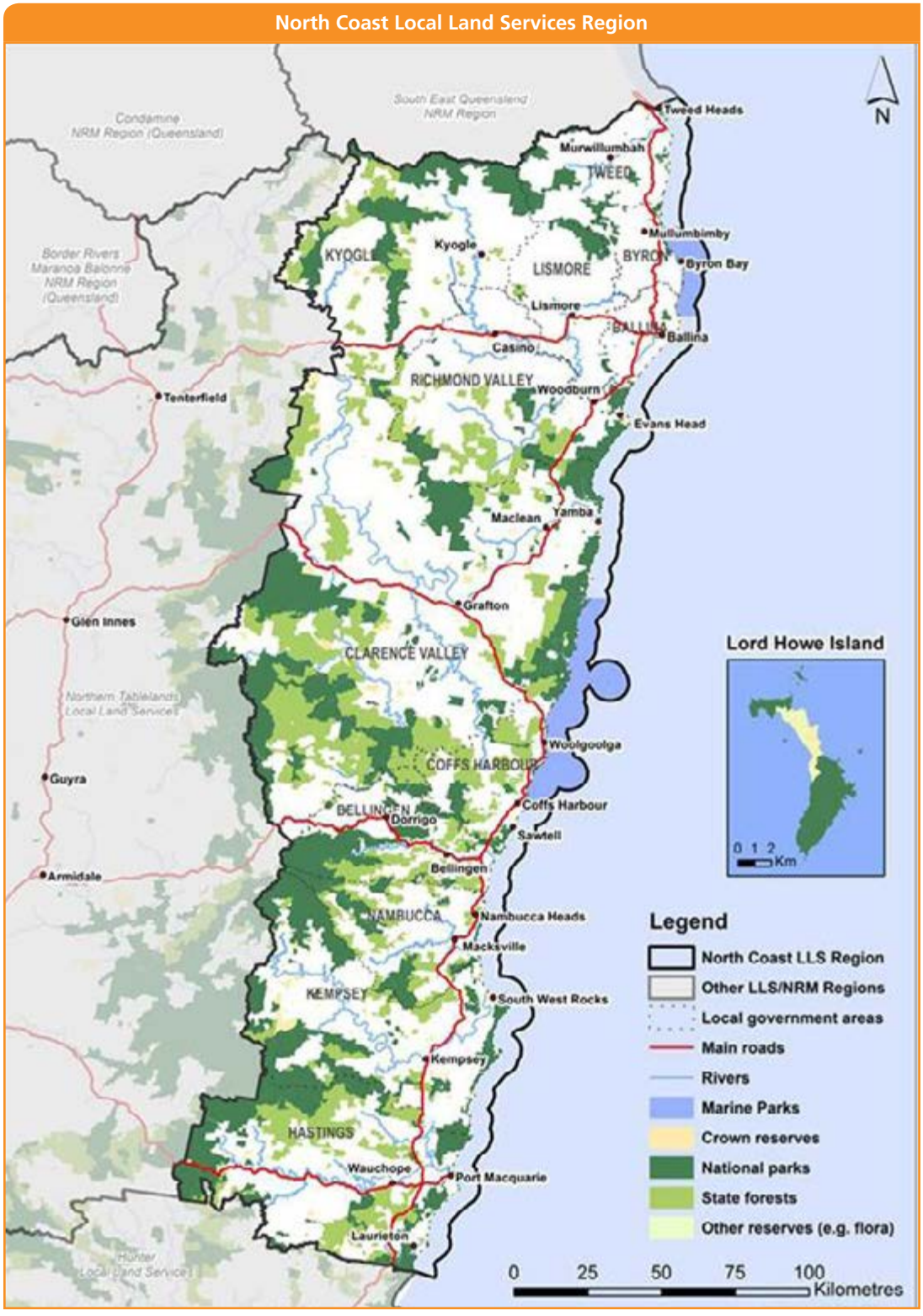


Figure 3.1. North Coast Local Land Services region.

Landscape values and impacts

A diversity of natural landscapes, nine larger river systems, and a typically sub-tropical climate provide for nationally recognised biodiversity, wilderness and wetland areas, combined with complex and diverse soil systems. The North Coast Region includes one of Australia's 15 biodiversity hotspots. It is considered the most biodiverse area in NSW, supports the greatest number of native plant and animal species of any area in NSW, and includes the greatest number of threatened species (221 flora, 152 fauna) (Natural Resources Commission 2014).

While a significant proportion of the Region is within terrestrial and marine protected areas, there are many threatened species and ecological communities that occur on private land. The ongoing management of competition and predation from pests is a significant component of threatened species and ecological communities threat abatement and recovery planning.

Livelihood values and impacts

The North Coast supports a range of natural resource-based industries including beef, dairy, blueberry, macadamia, intensive horticulture, fishing and aquaculture, timber production and tourism (see Figure 3.2 and 3.3).

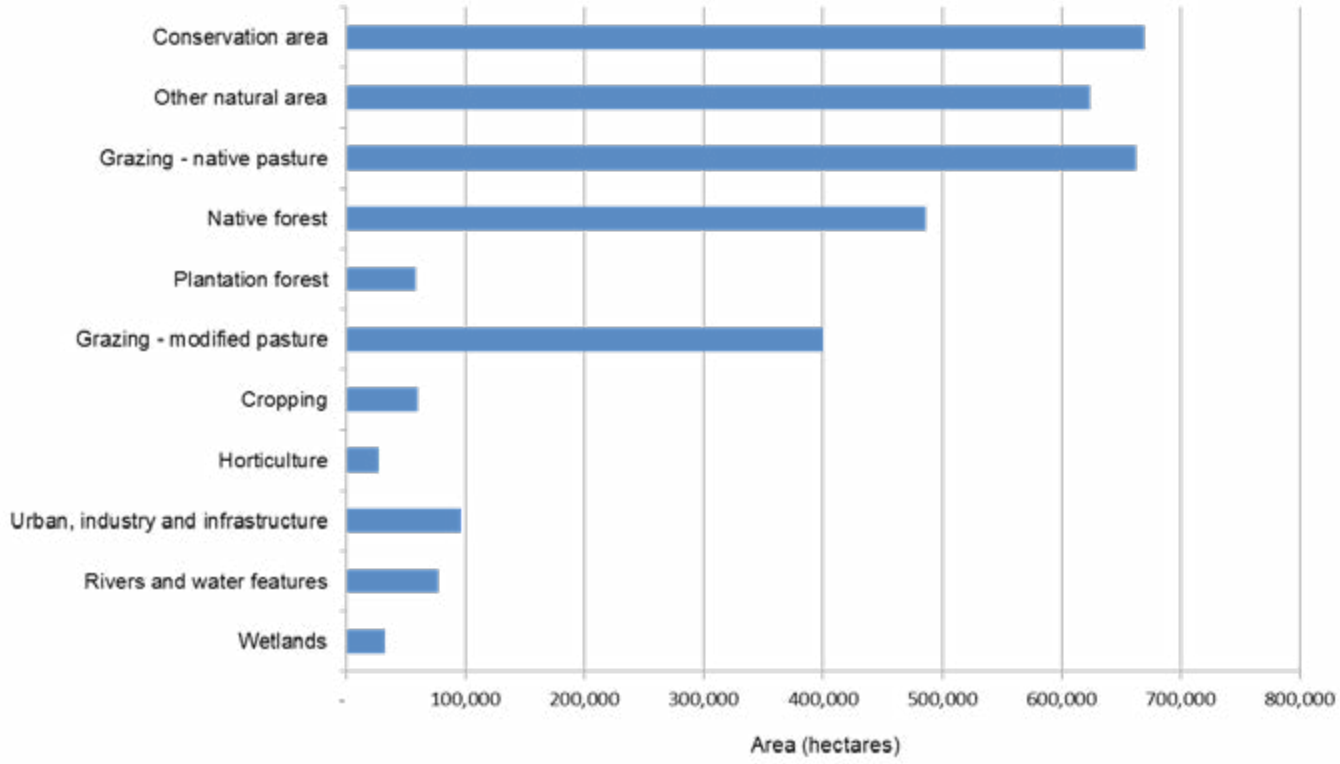


Figure 3.2 North Coast LLS region land use.

There are many small rural properties and peri-urban areas. Many beef and dairy properties are also relatively small and often supported by off-farm income.

Under-utilised properties and absentee land managers are a feature of the region. Their absence and lack of participation in local land management invariably reduces the effectiveness of local pest animal management. There is a clear need to raise absentee land manager awareness of their obligations under the *Biosecurity Act 2015* and how they can participate effectively in local pest management.

There is a significant need for pest animal management in the region, which is compounded by the variety and complex patterns of land uses and the breadth of impacts this brings. For example, wild dogs have a significant impact on the economic assets of the North Coast. Based on land manager reports to North Coast LLS, since 2011 an annual average of 368 calves, 52 cattle and 234 sheep have been maimed/lost to wild dog predation. Disease transmitted by wild dogs can also have a major impact on an enterprise's profitability and sustainability (e.g. Neospora is the most common infection that reduces the reproductive output of cattle, and hydatids can cause a significant reduction in body weight).

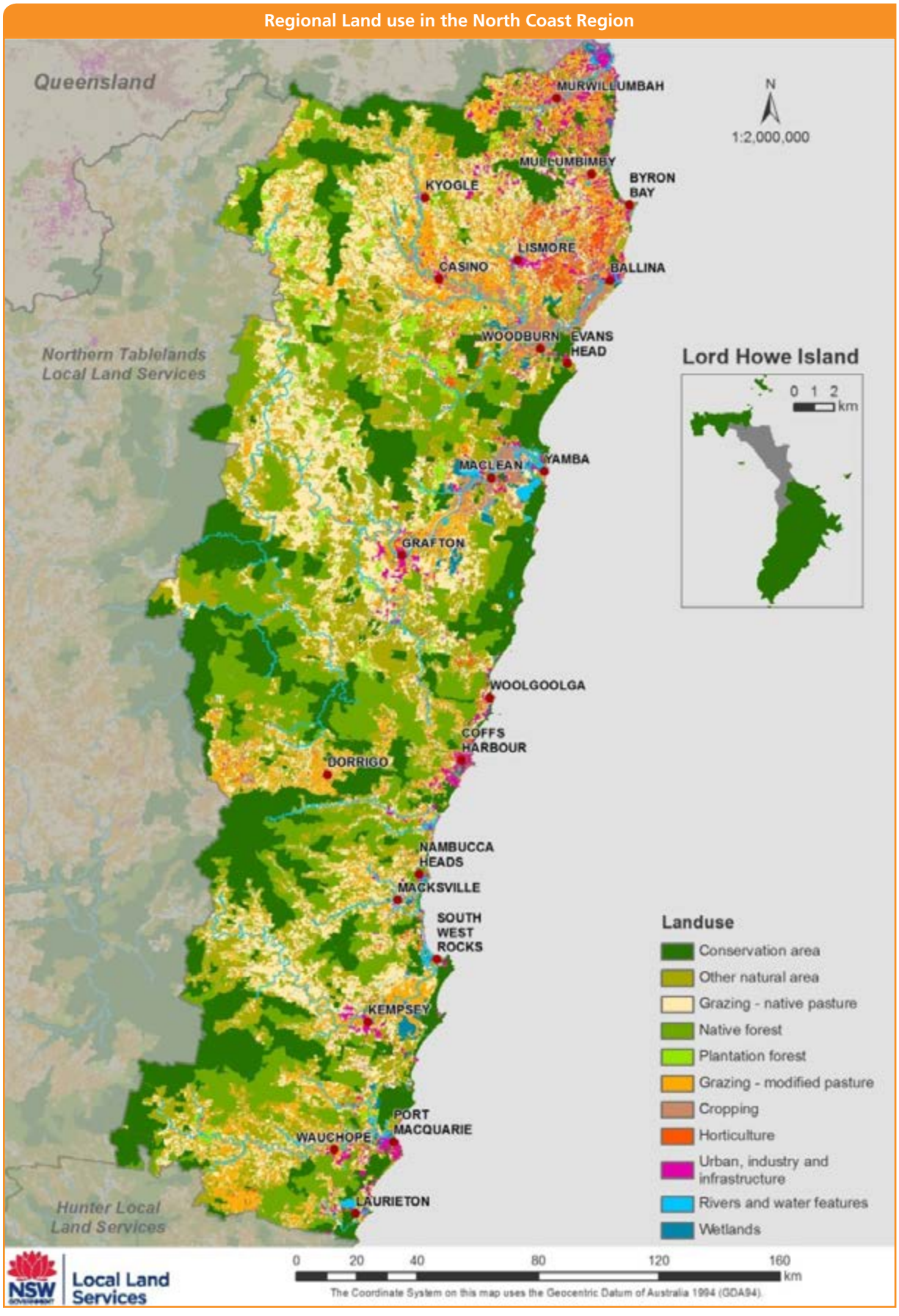


Figure 3.3. Regional Land use in the North Coast region.

Lifestyle values and impacts

Approximately 506,000 people reside on the North Coast. The major population centres are located on or near the coast and are connected primarily by coastal transport routes — they include Tweed Heads, Murwillumbah, Casino, Lismore, Ballina, Grafton, Coffs Harbour, Nambucca, Kempsey and Port Macquarie (see Figure 3.1).

The interaction of pest animal distribution, increasing population size and distribution, and urbanisation means more communities are potentially affected by pest animals. Impacts include mental health, direct harm from contact, and quality of life. Wild Dog and fox attacks on livestock and pets, lethal or otherwise, cause emotional distress to land managers; potentially spreading diseases and threatening human health, safety and wellbeing (Natural Resources Commission 2016).

Since 2014 North Coast LLS has been notified of the following community impacts by Wild Dogs: 4 attacks on people, 73 attacks on domestic dogs, and 24 wild dog sightings in peri-urban areas.

Pest impacts also include causing conflict between public and private land managers, operators of different (and neighbouring) rural enterprises, and negative economic impacts in the communities where pest animal attacks are occurring.

Cultural values and impacts

The North Coast is the traditional home to six Aboriginal nations (North Coast LLS 2016b). There are currently approximately 21,000 Aboriginal people in the Region, and 23 Local Aboriginal Land Councils, reflecting the diversity of the community.

The region contains many significant cultural sites, special places and physical evidence of traditional land use. Continued use of wild foods and medicines is an important activity highly valued by Aboriginal people. Four Indigenous Protected Areas containing biodiversity and cultural resource values are in the Region. Pest animals impact on the ability to conserve knowledge, access significant places, and practice culture.

The region's Aboriginal communities have made a significant contribution to the delivery of NRM activities (including pest management) to maintain and improve their cultural values. In most respects the Aboriginal community will be engaged in a similar way, and have similar pest management responsibilities, to the wider community as set out throughout the plan and in Section 5.14.

The potential for pest animals to impact on sites and native assets of cultural significance is an important consideration. There is also sensitivity around identifying sites for pest management due to possible inappropriate visitation and degradation. It is intended that these issues should be addressed in local pest animal planning that involves representatives of relevant Aboriginal communities.

Lord Howe Island

The region includes the World Heritage listed Lord Howe Island Group located 585 km east of Port Macquarie. The main island is 1,455 ha in area with outstanding natural landscapes and rich biodiversity.

The Lord Howe Island Board has developed the Lord Howe Island Biosecurity Strategy in consultation with the Island's community (Lord Howe Island Board 2016). The Board is the key agency responsible for implementing Biodiversity Management Plan pest animal control actions and eradication programs.

While the Strategy aligns with the NSW Biosecurity Strategy 2013-2021 targets and considers risk and feasibility, its priorities were developed prior to the pest animal management prioritisation approaches and obligations that support the *Biosecurity Act 2015* (as detailed in this plan).

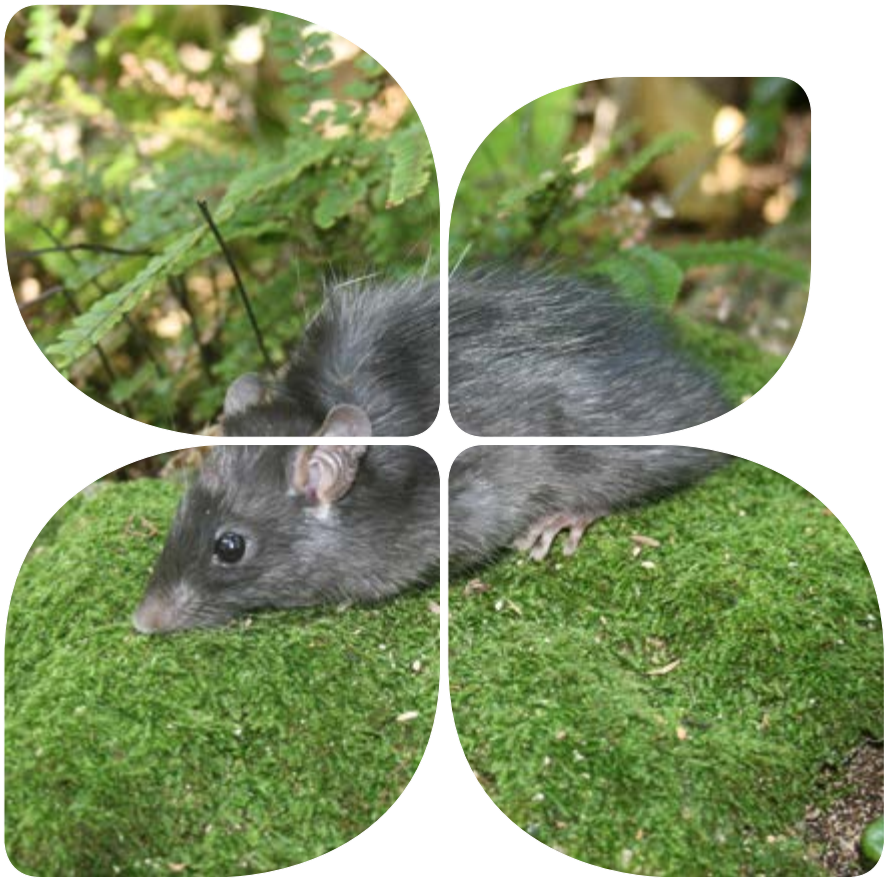
Pest animal management seeks to protect the World Heritage values of the Lord Howe Island Group. Successful projects have seen the eradication of feral pigs, feral cats, feral goats and African Big-headed Ant.

The Board intends to proceed with the eradication of the Black Rat and House Mouse in winter 2018. If successful the Board will be able to declare their eradication 2 years post baiting.

A table of significant pest animals on Lord Howe Island is included in section 5.13. There are a number of other priority invasive pest animals for Lord Howe Island and these can be found within the Lord Howe Island Biosecurity Strategy at http://www.lhib.nsw.gov.au/.

Current knowledge gaps in regional impacts

All pest animals considered in this plan have significant social, economic cultural and environmental impacts. For some species, such Wild Dogs where work has been done at state and regional scales, there is some information documenting these impacts. However, for many pest species these impacts are often poorly understood, harder to quantify, and/or poorly documented. The Regional Pest Animal Committee will attempt to gather pest impact information to address the main knowledge gaps.



4. Managing our pest animals

The following section details the management categories that will be used to minimise and mitigate the impact pest animals have on the community, environment and primary industries (Table 4.1).

The section captures the goal for each category, along with the land manager responsibilities that will contribute to achieving that goal.

Pest animals in the North Coast region have been prioritised based on this framework.

Table 4.1. Regional pest animal management categories, goals and all land managers' responsibilities.

Management category	Overview
Prevention	**Goal**: To prevent the pest animal species arriving and establishing in the Region causing adverse impacts on the environment, society and the economy. **Responsibility**: To understand and report any sightings of alert species.
Eradication	Goal: To permanently remove the species from the State or Region and to develop actions to prevent its re-establishment. **Responsibility**: To participate in coordinated programs and stay up-to-date with current information on pest animals in the region.
Containment	**Goal**: To prevent the spread of the pest animal species onto other parts of the State or Region. **Responsibility**: To participate in coordinated programs, stay up-to-date and apply best practice pest animal management practices.
Asset based protection	**Goal**: To reduce the impact of widespread pest animals on key sites/assets with high economic, environmental and social value. **Responsibility**: To participate in coordinated programs, stay up-to-date and apply best practice pest animal management practices. Ensure practices are coordinated with the wider community.
Limited action	**Goal**: Applies only to species that have a low to negligible risk in the region or for which further investigation is required on effective control techniques and strategies for management. **Responsibility**: To stay up-to-date with current information.

5. Our priority pest animal species

The North Coast Regional Pest Animal Committee used the Department of Primary Industries' NSW pest animal species list (Department Primary Industries 2018) to identify the species that do, or have the potential to, impact the North Coast region. The pest animals identified as a priority for management are found in Table 5.1.

Pest animals for the North Coast region have been prioritised based on level of risk and feasibility of control and assessed using prioritisation guidelines within the assessment tool within the South Australian Pest Animal Risk Management Guide (see Appendix 1).

Risk assessments were carried out at the *regional scale*, giving a robust assessment of the management goals and objectives for each pest animal. Assessments at a land use scale were difficult, and so not carried out, because of time constraints, limits to the availability of expert knowledge, the scale and intensity of landuse (i.e., many landuses in a small area, see Figure 3.3), the fluid movement of pests across adjoining landuses, and multiple impacts of pests on more than one land use made.

This section provides a summary of pest animal management programs in the North Coast. Brief sections are included for Common Carp and Mozambique Tilapia, followed by the priority species identified in Table 5.1. Species have been listed *alphabetically* and categorised into management categories and further strategies and actions detailed.

The situation with pest animals on Lord Howe Island differs significantly to the mainland part of the region. Lord Howe priorities are referred to in Sections 3 and 5.13 of this plan.

The pest animal distribution maps in this plan are based on statewide data compiled in 2016 from LLS, Office of Environment and Heritage, and Forestry Corporation of NSW reports. The maps are at a coarse regional scale and are intended to provide general guidance only about pest animal distribution. A key priority for future implementation of this plan will be to improve reporting of pest animals to refine regional information collected (including mapping) on pest animal distribution and relative abundance. This improved information will better guide management and investment and assess effectiveness.

5.1 Common Carp

Common Carp are a major environmental pest that have impacted water quality and a wide range of native species in many catchments. Almost all fish species are difficult to control once established, but species specific biological control options offer some hope in controlling widespread aquatic pest species, in the same way that the Calici virus has had a big impact on rabbit numbers.

The strategic focus of management for carp in the region will be to support any state-wide biological control programs (e.g. the strategic release of the Cyprinid herpes virus).

Common Carp occur in the Tweed, Richmond and Byron catchments. Regional actions for addressing carp impacts will be consistent with the National Carp Control Plan.

The goal of Carp management at the regional scale is Containment.

Expectations of land managers

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

- reduce the risk of carp being released into the environment.

Examples of activities a land manager could undertake to achieve to these outcomes are:

- participating in coordinated pest animal control programs
- reporting any carp activity (sightings, signs of presence, impacts) to neighbours and their local LLS Biosecurity ranger (and/or via FeralScan).

5.2 Mozambique Tilapia

Mozambique Tilapia occur in the Tweed river system. Regional actions for addressing Tilapia impacts will be consistent with the Draft DPI Mozambique Tilapia Incursion Response Plan.

The goal of Mozambique Tilapia management at the regional scale is Containment.

Expectations of land managers

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

- reduce the risk of Tilapia being released into the environment.

Examples of activities a land manager could undertake to achieve these outcomes are:

- participating in coordinated pest animal control programs
- reporting any Tilapia activity (sightings, signs of presence, impacts) to neighbours and their local LLS Biosecurity ranger (and/or via FeralScan).

Table 5.1. Summary of North Coast LLS pest animal management programs.

Pest animal	Program management goal (category)	Section in plan	Program management objective
Cane Toad	Eradication Program A. Cane Toad Biosecurity Zone	5.3	Maintain status of exclusion zone
	Containment (Contain spread) Program B. Cane Toad Core Infestation Area	5.3	Protect key environmental assets
Feral Cat	Asset based protection (Manage pest animal popns) Program. North Coast LLS Region	5.4	Protect threatened species Improve cat owner awareness and behaviour
Wild Deer Red Deer, Hog Deer, Sambar Deer, Chital, Rusa Deer, Fallow Deer	Asset based protection (Protect sites) Programs A. Port Macquarie Wild Deer Population; B. Upper Macleay; C. Nambucca Wild Deer population; D. Nana Glen - Bucca – Woolgoolga Wild Deer Population	5.5	Increase public safety Protect priority agricultural and ecological sites
	Containment (Destroy populations) Program E. Small Chital Deer Population near Coffs Harbour	5.5	Contain with the aim of eradication Protect priority agricultural and ecological sites
	Containment (Contain spread) Exclusion zone Program F. All areas outside the main deer populations	5.5	Implement surveillance programs Support programs protecting key environmental assets
European Red Fox	Asset based protection (Manage pest animal popns) Program A. North Coast LLS Region	5.6	Protect rural and livestock assets Protect threatened shorebirds and other threatened species

Pest animal	Program management goal (category)	Section in plan	Program management objective
Feral Goat 	Containment (Contain spread) Program A. North Coast LLS Region	5.7	Protect livestock from disease Minimise environmental impacts on National Parks
Wild Horse 	Asset based protection (Manage pest animal popns) Programs A. Yuragir – Glenugie-Halfway Creek population B. Guy Fawkes population	5.8	Increase public safety Minimise environmental and agricultural impacts in Guy Fawkes and Yuragir areas
	Containment (Contain spread) Program C. Remaining areas of the region where Wild Horses are absent	5.8	Implement surveillance programs Increase public awareness Protect priority ecological sites
Indian Myna 	Asset based protection (Manage pest animal popns) Program A. North Coast LLS Region	5.9	Promote pest bird management practices Protect priority agricultural, ecological and community sites
Feral Pig 	Asset based protection (Protect sites and manage pest popns) Programs A. Coastal NP & SF & Bungawalbin areas B. Upper Clarence C. Upper & Lower Hastings	5.10	Protect horticulture and grazing assets Protect wetland and coastal conservation areas
	Containment (Contain spread) Program D. areas where feral pig is absent or areas are small and isolated	5.10	Implement surveillance programs Manage and contain populations Protect priority agricultural and ecological sites
Wild Rabbit 	Asset based protection (Manage sites) Program Area A. North Coast LLS Region	5.11	Promote farm management strategies Protect threatened species habitat
Wild Dog 	Asset based protection (Manage pest popns) Program Area A. North Coast LLS Region	5.12	Ensure human health and well-being Increase land manager participation in wild dog management Minimise wild dog impacts Build knowledge that improves determination of dingo conservation status
Alert species Cane Toad, Red-eared Slider Turtle, Red Imported Fire Ant, Big Headed Ant, Indian Ring-necked Parrot	Prevention Program Area A. North Coast LLS Region	1.7	Protect environmental, economic and social values

5.3 Cane Toad

Cane Toad distribution

The invasion and establishment of the Cane Toad in NSW has been identified as a "key threatening process" under the *Biodiversity Conservation Act 2016*. Although the Cane Toad is listed as a widespread pest animal under the *Biosecurity Act 2015* (Division 2 of Schedule 3), its current distribution in NSW is restricted to the far north-east coast.

Management goal

The management goals for the Cane Toad are determined by the Biosecurity Zone established under the Biosecurity regulations.

The Cane Toad containment zone (or core infestation area) aligns with the known distribution of the main Cane Toad populations in the region. The Biosecurity Zone (or exclusion zone) comprises the remainder of the region where Cane Toads are largely absent. The Cane Toad Biosecurity Zone map is currently under development and was not available at the time of writing of this plan. The final Biosecurity Zone map will be captured within the final Biosecurity Regulations.

The Containment zone management goal (as per the Biosecurity regulation) aligns with this plan's Containment (contain spread) category.

The Biosecurity zone management goal (as per the Biosecurity regulation) aligns with this plan's Eradication category (Tables 5.2a-5.2b).

Regional management focus

The North Coast region has a unique role in Cane Toad management due to the location of the Biosecurity Zone. In the absence of biological or other controls to achieve eradication or significant reduction, the focus of regional management is to:

- minimise Cane Toad impacts on environmental assets in the Containment (core infestation) zone
- maintain the status of the Biosecurity (exclusion) zone
- support community awareness and Cane Toad management programs.

Expectations of land managers

All land managers can reduce risks from Cane Toad populations on land under their care and control, by undertaking activities:

- In the Containment zone that:
  - ◊ minimises or eliminates the impacts of cane toads on their land
  - ◊ prevents the spread of cane toads onto other parts of the region.
- In the Biosecurity zone, that:
  - ◊ reduce the risk of cane toads being released into the environment
  - ◊ continually suppress and destroy cane toads on their land
  - ◊ notify the presence of a new Cane Toad infestation.

Examples of activities a land manager could undertake to achieve to these outcomes are:

- participating in coordinated pest animal control programs
- undertaking management activities that incorporate both initial and follow up pest animal control
- reporting any cane toad activity (sightings, signs of presence, impacts) to neighbours in the Biosecurity zone, and to their local LLS Biosecurity ranger (and/or NSW DPI Invasive Plants and Animals Enquiry Line, ph: 1800 680 244).

Table 5.2a. Cane Toad sub-regional management programs.

Program Name / Area	Objective	Management Goal	Assets	Activities	Key stakeholders
A. Cane Toad Biosecurity Zone **(south and west of the containment line)**	Maintain status of exclusion zone	Eradication	**Social** Minor impact on unaware humans, threat to domestic pets, Aboriginal cultural heritage. **Environmental** Potential sites of spread e.g., Lake Innes NR, Yuragir NP, Hat Head NP. Lethal toxic ingestion of threatened species, e.g. Spotted-tailed Quoll, Pale-headed Snake, Stephens' Banded Snake, and threatened frog species. **Economic** Potential impact on eco-tourism.	CT1 Implement passive surveillance programs (including high risk pathways and conservation areas). CT2 Identify any new incursions. CT3 Develop and implement rapid response plans for new incursions.	North Coast LLS DPI Local Government OEH / NPWS Public land managers Rural industries Private land managers
B. Cane Toad Core Infestation Area **(north and east of the containment line)**	Protect key environ-mental assets	Containment (Contain Spread) - Core infestation area	**Social** **Minor** impact on unaware humans, emotional stress from fauna loss, threat to domestic pets. **Environmental** Priority conservation areas, e.g. Bundjalung NP, Nightcap NP, Border Ranges NP. Ecological values of Ramsar Wetlands, Gondwana Rainforests, Littoral Rainforest and coastal vine thickets. Lethal toxic ingestion of threatened species, e.g. Spotted-tailed Quoll, Pale-headed Snake, Stephens' Banded Snake, and threatened frog species. **Economic** Minor impact on eco-tourism.	CT4 Monitor the containment line and high risk pathways to protect the exclusion zone. CT5 Identify key sites and assets at risk of Cane Toads in the core infestation area. CT6 Support key partner's Cane Toad programs in the infestation zone. CT7 Develop coordinated management plans / programs in priority areas. CT8 Focus cooperative management on high priority native species and ecological communities. CT9 Support Research and Development initiatives to improve effectiveness of Cane Toad control.	North Coast LLS DPI Local Government OEH / NPWS Public land managers Rural industries Private land managers

Table 5.2b. Cane Toad community engagement activities.

Outcome	Activity	Key stakeholders
Eradication, Contain Spread	Run education and awareness programs including land manager obligations under the *Biosecurity Act 2015.* Raise absentee land manager awareness of their obligations under the *Biosecurity Act 2015* and how they can participate effectively in local cane toad management.	DPI, North Coast LLS, Local Government, OEH/NPWS, Landcare

5.4 Feral Cat

Feral Cat distribution

Feral Cats are a common and elusive predator that colonise a wide range of habitats, eat a wide range of prey, and can survive with limited access to water. Feral Cat predation is recognised as a key threatening process in NSW (NSW Scientific Committee 2000). Feral Cats are free-living, have limited or no reliance on humans for their survival, survive and reproduce in self-perpetuating populations, and occur in virtually all terrestrial habitats in Australia (NSW Scientific Committee 2000). They impact threatened and other native fauna across a wide range of natural and modified environments including regional towns and built up areas.

Their distribution is not accurately mapped but pest animal practitioners in the North Coast region consider them to be widespread.

Management goal

The goal of Feral Cat management at the regional scale is Asset-based protection (manage pest animal populations) (Tables 5.3a-5.3b).

Asset based protection may need to be supported by cross-tenure landscape-scale strategies as Feral Cat distribution and some assets (e.g. native fauna, livestock) are widespread. At present control options for cats are limited and this means that controls are both expensive and limited in effectiveness. A range of strategies and improved control methods are needed for meaningful management of cats in the region.

On the north coast there is recognition that predators can have multiple, interactive, cumulative impacts on an asset. This plan supports the use of integrated pest management approaches where a range of strategies is used to manage a suite of pests (such as feral cats, wild dogs and foxes) in an effort to achieve complete asset protection.

Regional management focus

The lack of effective control methods for feral cats is a huge obstacle to their management. Regional management strategies are therefore focussed on:

- support the development of effective control methods
- promote best management practice for Feral Cat control
- support integrated approaches to predator management (i.e., strategies that manage a range of pests such as feral cats, wild dogs and foxes)
- raise awareness and change behaviour of domestic cat owners.

Expectations of land managers

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

- reduce the risk of feral cats being released into the environment.

Examples of activities a land manager could undertake to achieve to these outcomes are:

- participating in coordinated pest animal control programs
- reporting any Feral Cat activity (sightings, signs of presence, impacts) to their local LLS Biosecurity ranger (and/or via FeralScan).

Table 5.3a. Feral Cat regional management programs.

Program Name / Area	Objective	Management Goal	Assets	Activities	Key stakeholders
North Coast LLS Region	Protect threatened species Improve cat owner awareness and behaviour	Asset Based Protection (Manage Pest Animal Populations)	**Social** Human health; domestic pet attacks. **Environmental** Predation on threatened species and endangered populations (e.g., Shorebirds and Rufous Scrub Bird), risk of rodents and ground-nesting birds becoming threatened. **Economic** Livestock impacts; disease transmission.	FC1 Develop and implement a regional feral cat knowledge plan that identifies best practice control methods and address knowledge gaps. The study will contribute to the following actions. FC2 Support integrated predator management strategies (i.e., integrated management of wild dogs, foxes and cats). FC3 Identify key assets and locations in the region that are impacted by feral cats. FC4 Support coordinated projects by key partners that manage cats where they have greatest impact on threatened species, livestock on adjoining land, etc. FC5 Monitor change in populations of native species and other pest species following cat management. FC6 Support Research and Development that identifies more effective controls, and considers cat welfare issues. FC7 Support management and awareness programs that reduce the biosecurity threat of roaming domestic cats becoming feral. FC8 Support the investigation of legislative mechanisms to improve the management of domestic cats.	North Coast LLS DPI Local Government OEH / NPWS Department of Defence, Evans Head Public land managers Rural industries Private land managers Urban and peri-urban communities

Table 5.3b. Feral Cat community engagement activities.

Outcome	Activity	Key stakeholders
Asset protection	FC9 Increase community awareness of cat impacts, and the need for cat owner behaviour change. FC10 Ensure land managers understand their obligations under the *Biosecurity Act 2015* to manage feral cats. FC11 Promote Integrated Pest Management programs to land managers FC12 Promote a 'duty of care' and consideration of potential cat impacts by those involved in re-homing cats (e.g. Pet shops, pounds, animal welfare organisation). FC13 Raise absentee land manager awareness of their obligations under the *Biosecurity Act 2015* and how they can participate effectively in local feral cat management.	North Coast LLS DPI Local Government Public land managers Urban and peri-urban communities

5.5 Wild Deer

Wild Deer distribution

There are significant Wild Deer populations around Port Macquarie; populations in the Upper Macleay Valley, Nambucca and Nana Glen - Bucca - Woolgoolga area; a small Chital Deer population near Coffs Harbour; and a large part of the region where deer is absent or nearly absent (Figure 5.2). National Parks and Wildlife Service have reports of isolated sightings in other areas (Guy Fawkes River, Cathedral Rocks, Bellinger River, and New England National Parks).

Management goal

The goal of Wild Deer management at the regional scale is Asset based protection (manage pest animal populations). However, this varies slightly for each of the local populations / management areas identified in Tables 5.4a-5.4b.

Regional management focus

Wild Deer herbivory and environmental degradation are recognised as a key threatening process in NSW (NSW Scientific Committee 2005). Wild Deer management is a high priority due to their impacts on human safety, native environments, threatened species and ecological communities, and rural and horticulture production systems.

Managing their numbers and impacts is hindered by the limited number of effective controls available and a range of community perceptions about their status as a pest versus valuable resource. Many land managers do not have the ability or suitable firearms to undertake shooting successfully. In the absence of alternate control methods, Government is currently required to play a large role in coordinating on ground deer control.

The *Game and Feral Animal Control Act 2002* regulations have been suspended as they relate to hunting Wild Deer for the Local Government Areas of Port Macquarie, Kempsey, Nambucca Valley and Coffs Harbour. This will improve the management of Wild Deer, thereby minimising their impact on agriculture, the environment, economy and local communities, and allow more options for their control.

The main aims of North Coast Wild Deer management are:

- increase the effectiveness of control methods available, especially around urban and peri-urban areas
- undertake population density investigations for existing Wild Deer populations to determine what level of control is required to reduce current populations
- implement the priority actions of the Hastings Wild Deer Management Plan (North Coast LLS 2016c)
- support research for the approval of a humane toxin which will provide an additional control tool
- manage other high priority populations of Wild Deer in the region
- raise public awareness of the negative impacts of these pest animals
- better understand the biosecurity threat posed by Wild Deer, and the nature of their impacts on agriculture.

Expectations of land managers

All land managers can reduce risks from Wild Deer populations on land under their care and control, by undertaking activities:

- Where the management goal is containment, that:
  - ◊ minimise or eliminate the impacts of Wild Deer on their land
  - ◊ aim to destroy local Wild Deer populations (near Coffs Harbour) where that is feasible
  - ◊ prevent the spread of Wild Deer onto other parts of the region.
- Where the management goal is asset protection, that:
  - ◊ reduce the risk of Wild Deer being released into the environment
  - ◊ reduce the risk of Wild Deer accessing easy food and shelter on their land
  - ◊ reduce the negative impacts of Wild Deer on priority assets on their land and neighbouring lands.

Examples of activities a land manager could undertake to achieve to these outcomes are:

- participating in coordinated pest animal control programs
- undertaking management activities that incorporate both initial and follow up pest animal control
- reporting any Wild Deer activity (sightings, signs of presence, impacts) to neighbours and their local LLS Biosecurity ranger (and/or via FeralScan)
- reporting any deliberate release of deer (or other suspicious activity) to the DPI Game Licensing Unit and report any road related incidents or near misses to local police.

Wild Deer in the North Coast Region

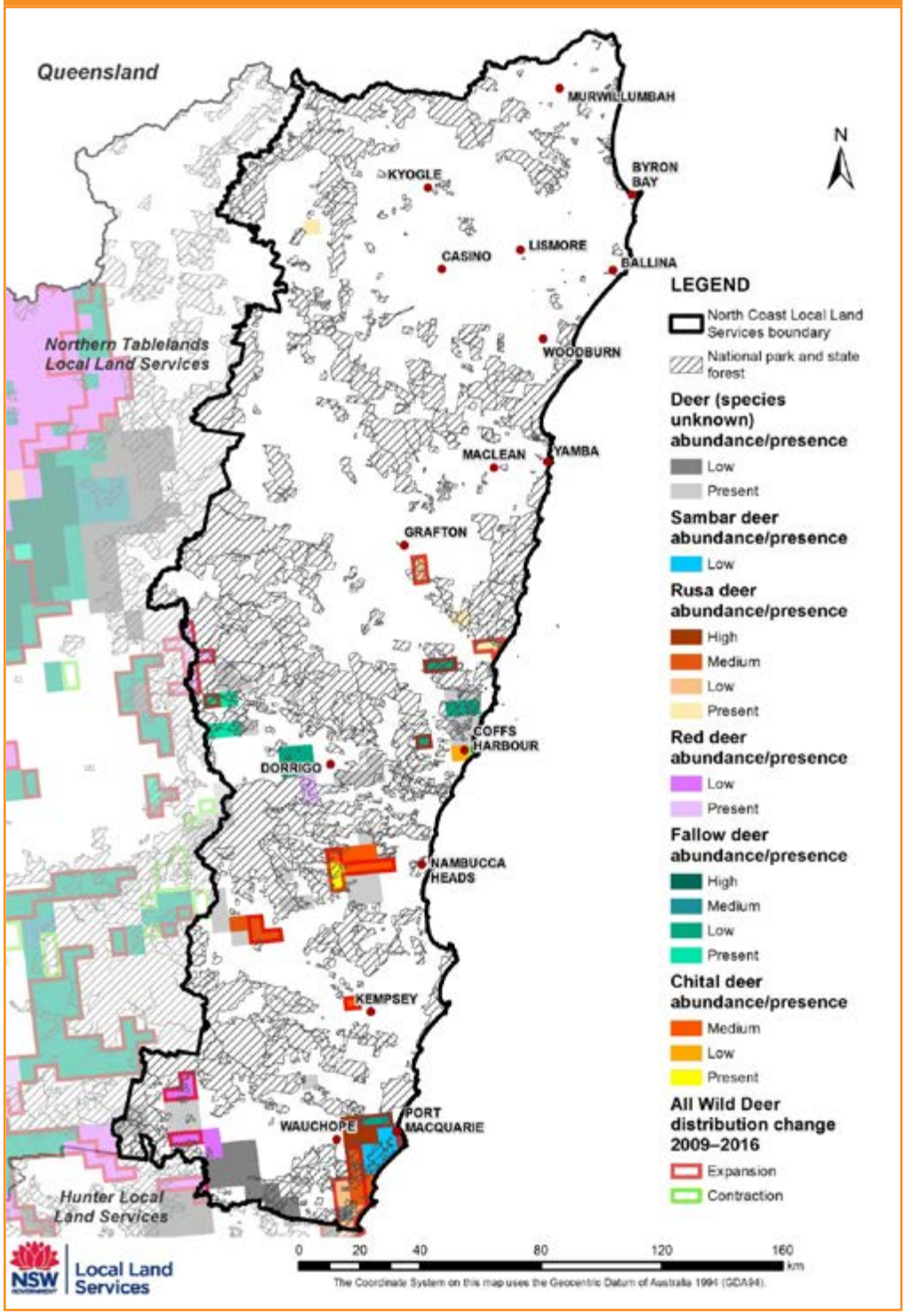


Figure 5.2. Wild Deer distribution in the North Coast region (DPI 2016).

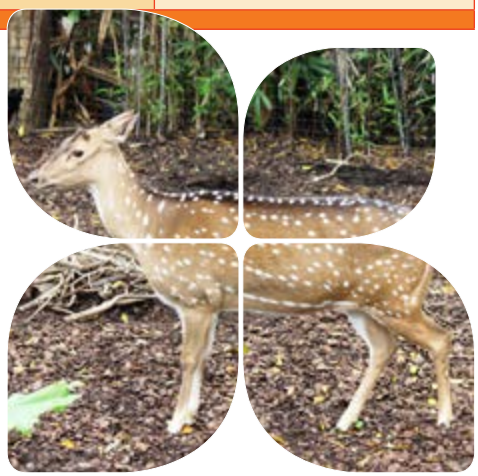
Table 5.4a. Wild Deer management programs for sub-regional management areas.

Program Name / Area	Objective	Management Goal	Assets	Activities	Key stakeholders
A. Port Macquarie Wild Deer Population **B. Upper Macleay Valley** **C. Nambucca Wild Deer Population** **D. Nana Glen - Bucca - Woolgoolga Wild Deer Population**	Increase public safety Protect priority agricultural and ecological sites	Asset Based Protection - Protect Sites	**Social** Impacts include traffic hazards and accidents, trampling gardens, damaging fences, aggressive behaviour to people and pets. **Environmental** Grazing and trampling impacts alter the structure and composition of EECs and threatened fauna habitat, priority sites include Lake Innes and Queens Lake NRs. **Economic** Damage to vineyards / horticulture / crops / commercial gardens; aggressive behaviour to livestock, spread of disease.	D1 Support research and trials to improve effectiveness of wild deer best management options. D2 Establish groups and Local Plans consistent with the Hastings Wild Deer Management Strategy. D3 Establish wild deer management groups and develop Local Plans in priority areas in Upper Macleay, Nambucca and Nana Glen-Bucca-Woolgoolga. D4 Support implementation of actions from Hastings Wild Deer Strategy and Local Deer Plans for other priority areas.	North Coast LLS DPI Port Macquarie Hastings Council Nambucca and Coffs Harbour Councils Local hunting clubs OEH / NPWS Crown Lands Public land managers Rural industries (e.g., vineyards, horticulture) Private land managers Police
E. Small Deer Population near Coffs Harbour	Contain with the aim of eradication Protect priority agricultural and ecological sites	Containment - Destroy Populations	**Social** Impacts include traffic hazards and accidents, trampling gardens, aggressive behaviour to people and pets. **Environmental** Impact upon plant community structure and floristics, direct and indirect impact on TS. **Economic** Damage to horticulture and crops, damage to fences, aggressive behaviour to livestock, spread of disease.	D5 Establish wild deer management groups and develop Local Plan with the aim to contain and destroy populations of Chital deer in Woolgoolga area. D6 Implement the Local Plan, e.g., land manager engagement; cross-tenure surveillance, mapping, population control; and prevent re-entry.	North Coast LLS DPI Coffs Harbour Council Local hunting clubs OEH / NPWS Crown Lands NSW ForestCorp Public land managers Rural industries (e.g., bananas, blueberries) Private land managers Police

Program Name / Area	Objective	Management Goal	Assets	Activities	Key stakeholders
F. Remaining areas of the region where Wild Deer are absent	Implement surveillance programs Support programs protecting key environmental assets	Containment - Contain Spread	**Social** Impacts include traffic hazards and accidents, trampling gardens, aggressive behaviour to people and pets. **Environmental** Impact upon plant community structure and floristics of EECs, direct and indirect impact on TS, recognized as a key threatening process. **Economic** Damage to horticulture and crops, damage to fences, aggressive behaviour to livestock, spread of disease.	D7 Surveillance and monitoring to locate any distribution changes or new Wild Deer populations. D8 Monitor pathways of potential introduction and develop preventative options. D9 Cooperative arrangements with Northern Tablelands, Tweed Council and SE Queensland to manage threat of entry from northern tablelands and scenic rim – Gold Coast areas. D10 Support programs to record sightings and investigate control options in priority areas (e.g., NPWS program in Guy Fawkes River, Cathedral Rocks, Bellinger River and New England NPs). D11 Develop and implement rapid response plans for new incursions. D12 Implement control programs for new populations.	North Coast LLS DPI Local Government Hunting and shooters clubs NPWS NSW Forest Corp Crown Lands Public land managers Rural industries (e.g., grazing, crops, horticulture) Private land managers Police SE Qld Partners

Table 5.4b. Wild Deer community engagement activities.

Outcome	Activity	Key stakeholders
Asset Protection Containment	D13 Establish wild deer management groups. D14 Run education and awareness programs (e.g. land manager obligations under the *Biosecurity Act 2015*, reporting all sightings, risks of spread by "seeding" areas with wild deer, pest vs desirable or game animal issues). D15 Raise absentee land manager awareness of their obligations under the *Biosecurity Act 2015* and how they can participate effectively in local wild deer management. D16 Run public safety awareness campaigns.	North Coast LLS DPI Local Government Hunting and shooters clubs Public land managers Rural industries



5.6 European Red Fox

European Red Fox distribution

The European Red Fox is an adaptive and elusive predator; it is common in rural and urban areas; it preys opportunistically on a wide range of species; and its distribution is influenced by natural habitat disturbance and availability of food and shelter (NSW Scientific Committee 1998). Foxes are widespread throughout the region, with variations in density influenced by how well their food and habitat needs are met. Actions that guide fox management are guided by the OEH Saving our Species (SoS) Program.

Management goal

The goal of European Red Fox management at the regional scale is Asset based protection (manage pest animal populations).

Regional management focus

Control methods have generally relied on shooting, poisoning and fencing. Reported stock losses in the North Coast region due to Fox predation are few and mainly relate to the take of poultry. However, the number of threatened species listings where foxes are identified as a threat continue to increase (Australian Government 2013). Significant improvements are being made in conventional and more innovative methods for fox control which should improve the region's asset-based protection strategies. This may need to be supported by cross-tenure landscape-scale strategies as some assets (e.g. native fauna, livestock) are widespread, and foxes may repopulate management areas (Tables 5.5a-5.5b).

Regional European Red Fox management in the region will focus on:

- support the development of new and integrated fox control strategies
- encourage integrated predator management programs (i.e., the integrated management of wild dogs, foxes and cats) where predator impacts are greatest
- seek resources to support local plan development and implementation of regional priorities, including those listed within the NSW Fox Threat Abatement Plan.

Expectations of land managers

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

- reduce the risk of foxes being released into the environment
- reduce the risk of foxes accessing easy food sources and shelter on their land
- reduce the negative impacts of foxes on priority assets on their land and neighbouring lands.

Examples of activities a land manager could undertake to achieve to these outcomes are:

- participating in coordinated pest animal control programs
- undertaking management activities that incorporate both initial and follow up pest animal control
- reporting any fox activity (sightings, signs of presence, impacts) to neighbours and their local LLS Biosecurity ranger (and/or via FeralScan)
- ensuring potential food sources such as carcasses, offal and food scraps are properly disposed of.

Table 5.5a. European Red Fox regional management programs.

Program Name / Area	Objective	Management Goal	Assets	Activities	Key stakeholders
North Coast LLS Region	Protect rural and livestock assets Protect threatened shorebirds and other threatened species	Asset Based Protection (Manage Pest Animal Populations)	**Social** human health (rabies carrier), mental health impacts due to pet and stock attacks, transmission of disease to pets. **Environmental** Threatened species (e.g. Beach Stone-curlew, Little Tern, Pied Oystercatcher, Long-nosed Potoroo). Priority locations span key areas of private and public land throughout the region. **Economic** dairy and beef cattle pregnancy termination; predation of calves, poultry, lambs; spread of hydatids to livestock.	**Activities** F1 Document key assets and locations in the region that are impacted by foxes. F2 Support fox management consistent with the NSW Fox Threat Abatement Plan priority sites and actions. F3 Identify main locations of fox impact on livestock, rural production and biodiversity. F4 Support local plan development and implementation of fox control for high conservation areas, and priority rural production areas. F5 Encourage integrated predator control programs (i.e., the integrated management of wild dogs, foxes and cats). F6 Support coordinated and collaborative cross-tenure asset-based and landscape scale management programs appropriate to the impacts. F7 Monitor effectiveness of management programs on fox populations and protection of identified assets. F8 Increase effective management options available by supporting Research and Development into fox control. F9 Support innovative fox control such as Integrated Pest Management, cross-tenure broad-scale baiting, management that has regard for fire, bio-control, exclusion fencing programs.	North Coast LLS DPI Local Government OEH / NPWS Public land managers Rural industries Private land managers Conservation groups

Table 5.5b. European Red Fox community engagement activities.

Outcome	Activity	Key stakeholders
Asset Protection	F10 Promote current best-practice fox management and monitoring. F11 Run education and awareness programs including land manager obligations under the *Biosecurity Act 2015* (e.g., general biosecurity duty obligations, mandatory measures). F12 Raise absentee land manager awareness of their obligations under the *Biosecurity Act 2015* and how they can participate effectively in local fox management.	North Coast LLS DPI Public land managers Private land managers Conservation groups

5.7 Feral Goat

Feral Goat distribution

There are only isolated populations of feral goats in the North Coast LLS region and those populations are at relatively low densities (Figure 5.3). National Parks and Wildlife Service has reported very recent sightings in areas outside the DPI mapping. These sites are Clarence estuary islands (not National Park), and Mt Neville Nature Reserve – Banyabba area. Most of the region is free of goats. Feral Goat competition and habitat degradation are recognised as a key threatening process in NSW (NSW Scientific Committee 2004).

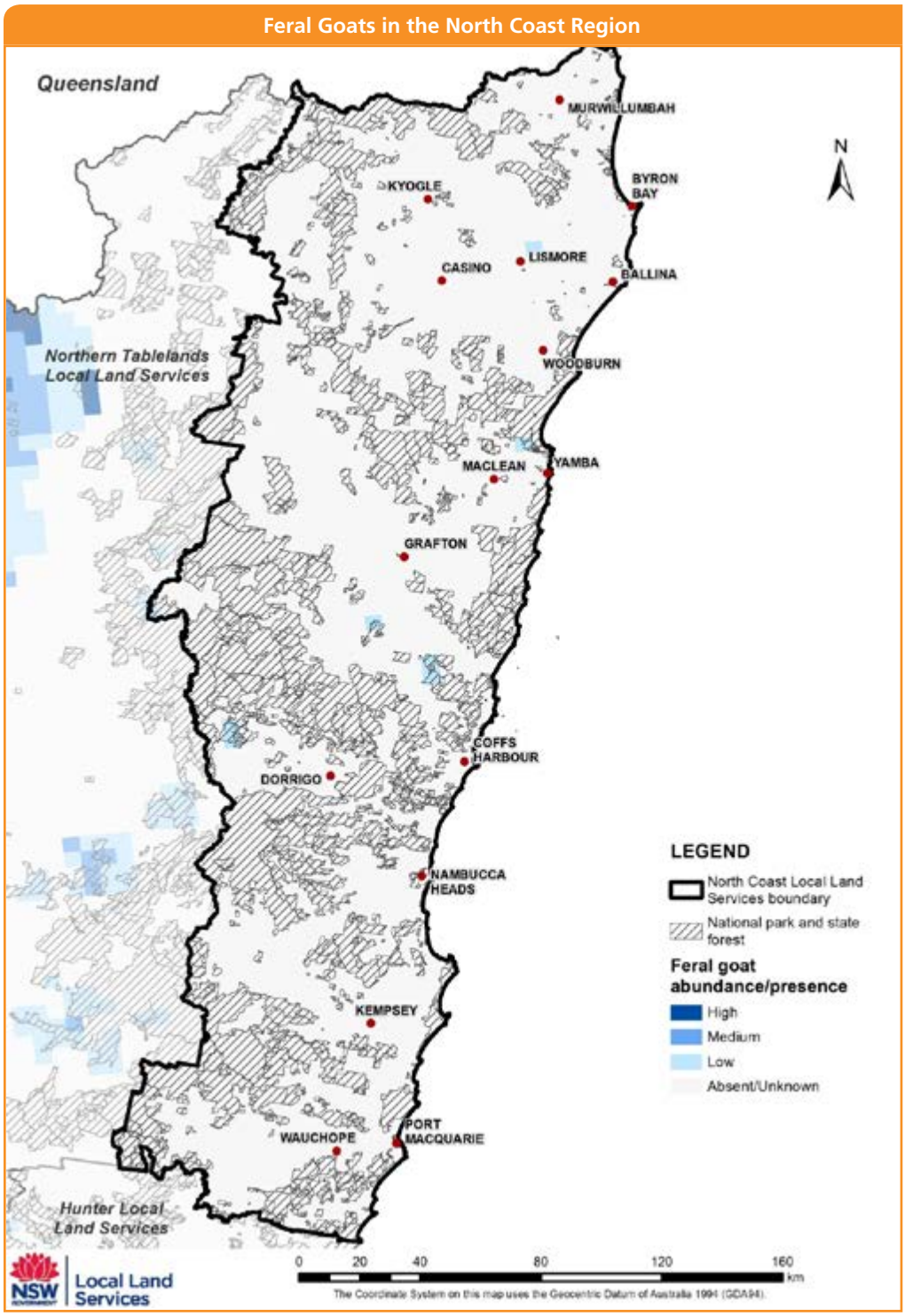


Figure 5.3. Feral Goat distribution in the North Coast region (DPI 2016).

Management goal

The goal of Feral Goat management at the regional scale is Containment (Contain Spread). This management goal is appropriate across the entire North Coast LLS region (see Tables 5.6a-5.6b).

Regional management focus

Feral Goats are potentially a significant agricultural and environmental pest, compete with livestock for pasture, contribute to land degradation through grazing and browsing, and impact on biodiversity. Due to their isolated occurrence in the region, the emphasis of regional Feral Goat management is:

- prevent the spread of the existing isolated populations into other parts of the region
- develop cooperative arrangements to prevent entry of Feral Goat into the region from adjoining regions, and
- reduce impacts on environmental assets by supporting the reduction and removal of existing populations from conservation areas.

Expectations of land managers

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

- minimise or eliminate the impacts of Feral Goat on their land
- aim to destroy local Feral Goat populations where that is feasible
- reduce the risk of feral goats breeding on or being introduced to their land
- prevent the spread of Feral Goat onto other parts of the region.

Examples of activities a land manager could undertake to achieve to these outcomes are:

- participating in coordinated pest animal control programs
- undertaking management activities that incorporate both initial and follow up pest animal control
- reporting any Feral Goat activity (sightings, signs of presence, impacts) outside the mapped distribution to their local LLS Biosecurity ranger and Feralscan.

Table 5.6a. Feral Goat regional management program.

Program Name / Area	Objective	Management Goal	Assets	Activities	Key stakeholders
North Coast LLS Region	Protect livestock from disease Minimise impacts on National Parks	Containment (Contain Spread)	**Environmental** General environmental impacts of goats with priority areas being high conservation areas and NPs; competition with rock wallaby populations. **Economic** Damage to fencing, disease issues in beef and dairy herds (especially potential to impact on Johne's Beef Assurance Scores).	G1 Surveillance and monitoring to locate any changes in distribution or new Feral Goat populations. G2 Monitor pathways of potential introduction and develop preventative options. G3 Cooperative arrangements with Northern Tablelands and Queensland partners to manage threat of entry from north and north-west. G4 Develop and implement rapid response plans for new incursions. G5 Support programs to monitor and remove goats from priority areas (e.g., NPWS program in Bundjalung NP, Mt Neville and Banyabba NR, other priority conservation and production areas). G6 Implement control programs for new populations and in priority areas (e.g. Guy Fawkes River NP) aiming for significant reduction.	North Coast LLS DPI Local Government Local hunting clubs OEH / NPWS Crown Lands Public land managers Rural industries (e.g., grazing) Private land managers

Table 5.6b. Feral Goat community engagement activities.

Outcome	Activity	Key stakeholders
Containment	G7 Run education and awareness programs (including land manager obligations under the *Biosecurity Act 2015*, advice on goat-proof fencing, and risks of using goats as an 'indicator' for wild dog activity around sheep herds). G8 Raise absentee land manager awareness of their obligations under the *Biosecurity Act 2015* and how they can participate effectively in local goat management.	North Coast LLS Public land private managers

5.8 Wild Horse

Wild Horse Distribution

Within the North Coast region, there is a large Wild Horse population in south Yuragir - Glenugie - Halfway Creek area; Guy Fawkes population has reportedly grown to approximately 1600 horses; and a single Wild Horse has been reported at Brooms Head (Figure 5.4).

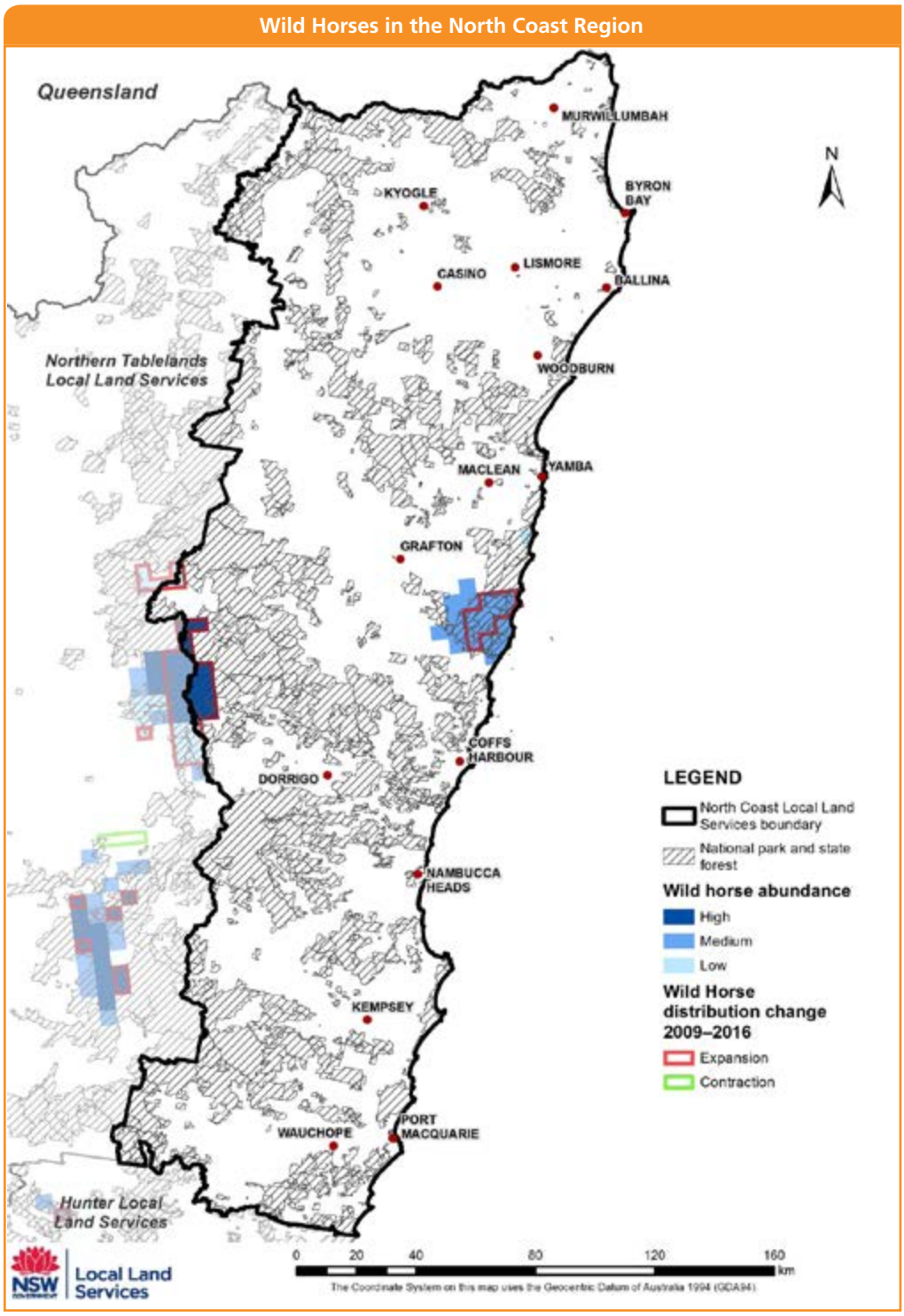


Figure 5.4. Wild Horse distribution in the North Coast region (DPI 2016).

Management goal

The goal of Wild Horse management at the regional scale is Asset based protection (manage pest animal populations). However, this varies slightly for each of the local populations / management areas identified. Refer to Table 5.7a-5.7b.

Regional management focus

Wild horses can be a threat to humans and road safety. They can also have serious impacts on vegetation, wetlands, streams and native animals and landscapes, especially in sensitive environments. Community perspectives on wild horses in the environment vary considerably and there is a low tolerance for anything but the most humane management methods.

The focus of regional Wild Horse management will be:

- support development, trial, implementation and awareness of humane control practices
- increase public safety and reduce traffic impacts of wild horses
- manage the impacts of the two existing Wild Horse populations
- maintain the status of the exclusion zone.

Expectations of land managers

All land managers can reduce risks from Wild Horse populations on land under their care and control, by undertaking activities:

- Where the management goal is containment, that:
  - ◊ minimise or eliminate the impacts of wild horses on their land
  - ◊ continually suppress wild horses on their land
  - ◊ prevent the spread of wild horses onto other parts of the region.
- Where the management goal is asset protection, that:
  - ◊ reduce the risk of wild horses breeding on or being introduced to their land
  - ◊ reduce the risk of wild horses being released into the environment
  - ◊ reduce the negative impacts of wild horses on priority assets on their land and neighbouring lands.

Examples of activities a land manager could undertake to achieve to these outcomes are:

- participating in coordinated pest animal control programs
- undertaking management activities that incorporate both initial and follow up pest animal control
- Report any wild horse sightings or activity outside the mapped distribution to their local LLS Biosecurity ranger and any road related incidents or near misses to local police.

Table 5.7a. Wild Horse management programs for sub-regional management areas.

Program Name / Area	Objectives	Management Goal	Assets	Activities	Key stakeholders
A. Yuragir - Glenugie - Halfway Creek population **And** **B. Guy Fawkes population**	Increase public safety Minimise environmental and agricultural impacts in Guy Fawkes and Yuragir areas	Asset Based Protection (Manage Pest Animal Populations)	**Social** Human safety; traffic safety (e.g. Pacific Highway near Halfway Creek). Community has mixed views about wild horse control. Local heritage value of the Guy Fawkes population. **Environmental** Trampling, erosion, soil compaction and seed spread in GFR NP. Biodiversity values of NP and public lands in Yuragir-Glenugie-Halfway Ck area; competition with native herbivores. **Economic** Damage to fencing. Trampling and erosion of rural lands.	H1 Support actions that address public and road safety issues associated with wild horses. H2 Support the Clarence Wild Horse Committee to plan and implement wild horse population control. H3 Support coordination and implementation of Guy Fawkes River Horse Management Plan (NPWS 2006) to conserve the park's natural values, and provide for humane control of horses. H4 Reduce impact on Aboriginal and European cultural values in the Guy Fawkes River NP. H5 Support development, trials and implementation of effective and humane horse control practices.	North Coast LLS DPI OEH / NPWS Public land managers ForestCorp NSW DPI Lands Private land managers Clarence Valley Council Roads and Maritime Services RSPCA GFR NP Horse Reference Group NSW Police
C. Remaining areas of the region where Wild Horses are absent	Implement surveillance programs Increase public awareness Protect priority ecological sites	Containment (Contain Spread) Exclusion zones	**Social** Human safety; traffic safety. Community has mixed views about wild horse control. **Environmental** Trampling, erosion, soil compaction and seed spread. Potential impacts on biodiversity and wetland values. **Economic** Damage to fencing. Trampling and erosion of rural lands.	H6 Develop / apply agreed quarantine procedures. H7 Monitor high risk pathways and any change in distribution of existing populations. H8 Monitor conservation areas for new wild horse populations. H9 Develop and implement rapid response plans for new incursions with the aim of complete and humane control.	North Coast LLS DPI OEH / NPWS Public land managers Private land managers RSPCA

Table 5.7b. Wild Horse community engagement activities.

Outcome	Activity	Key stakeholders
Asset protection Containment	H10 Develop communications that are sensitive to community views on wild horses. H11 Run public safety awareness campaign (vehicle accident risk, bush-walking incidents). H12 Run education and awareness programs including land manager obligations under the *Biosecurity Act 2015*. H13 Raise absentee land manager awareness of their obligations under the *Biosecurity Act 2015* and how they can participate effectively in local Wild Horse management.	North Coast LLS DPI OEH / NPWS Roads and Maritime Services RSPCA

5.9 Indian Myna

Indian Myna distribution

Indian Myna is a pest in urban and rural areas. They can cause damage to the environment through selective feeding and competition for resources (such as hollows and food), damage and contaminate horticultural crops, occupy buildings and damage infrastructure (through nest building, defecation etc.) in urban environments. Indian Myna can be very aggressive towards native bird species. They are mainly found in urban, peri-urban and adjoining open areas and are considered to widespread in those environments in the North Coast Region.

Management goal

The goal of Indian Myna management at the regional scale is Asset-based protection (manage pest animal populations) (Tables 5.8a-5.8b).

Regional management focus

Although relatively widespread, characteristics of the Indian Myna suggest they have the potential to be managed by supported community programs. Populations are usually close to human settlements, they disperse slowly to new areas, they concentrate in large communal roosts, and their raucous aggressive behaviour means they are disliked by the community (Hanke 2013). A number of programs in the North Coast have developed very good information products, supported community trapping, and achieved some success but continued funding and support has been an issue. North Coast management will:

- identify and utilise best communication and trapping programs from recent regional programs
- support land manager / community Indian Myna programs in vicinity of priority rural, environmental and social assets.

Expectations of land managers

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

- reduce the negative local impacts of mynas on priority assets on their land.

Examples of activities a land manager could undertake to achieve to these outcomes are:

- undertaking property level management activities that incorporate both initial and follow up pest animal control
- reporting any myna sightings (sightings, signs of presence, impacts) outside the mapped distribution to their local LLS Biosecurity ranger and Feralscan.

Table 5.8a. Indian Myna regional management programs.

Program Name / Area	Objectives	Management Goal	Assets	Activities	Key stakeholders
North Coast LLS Region	Promote pest bird management practices Protect priority agricultural, ecological and community sites	Asset Based Protection (Manage Pest Animal Populations)	**Social** Impact on human health by nesting in houses and spreading lice and increasing fire risk. **Environmental** Displaces hollow nesting native birds and other species. Harass other birds and wildlife. **Economic** Destroy soft fruit crops including grapes; damage to infrastructure and buildings.	**Activities** IM1 Identify key assets and locations in the region impacted by Indian Myna. IM2 Review existing and recent Indian Myna programs and products in the region, e.g., North Coast Indian Myna Strategy, Local Government and Landcare projects, Indian Myna coordinators. IM3 Support / build on recent effective Indian Myna programs. IM4 Develop local or regional coordinated Indian Myna programs in areas where management will provide most benefit. IM5 Increase effective management options available by supporting control programs and research and development that consider Integrated Pest Management, cross-tenure projects, bio-control, trapping, education and advice, etc. IM6 Incorporate monitoring into Indian Myna programs.	North Coast LLS DPI Local Government Landcare OEH / NPWS Public land managers Rural industries Private land managers

Table 5.8b. Indian Myna community engagement activities.

Outcome	Activity	Key stakeholders
Asset Protection	IM7 Encourage collaboration between agencies, Councils, Landcare and land managers. IM8 Promoted effective and best practice control methods to land managers. IM9 Run education and awareness programs including land manager obligations under the *Biosecurity Act 2015* (e.g., general biosecurity duty obligations, mandatory measures). IM10 Raise absentee land manager awareness of their obligations under the *Biosecurity Act 2015* and how they can participate effectively in local Indian Myna management.	North Coast LLS DPI Local Government Landcare Public and private land managers

5.10 Feral Pig

Feral Pig distribution

Distribution of feral pigs is shown in Figure 5.5. The main populations are coastal National Parks and State Forest areas east of Grafton, in the Bungawalbin – Bundjalung area, and reported sightings are increasing around Limeburners Creek and Hastings area. There is also a report of an unmapped population around Tweed (Tumbulgum). Northern Tablelands populations represent a threat to the North Coast region. Large areas of the region are free of feral pigs. Feral Pig competition, habitat degradation and disease transmission are recognised as a key threatening process in NSW (NSW Scientific Committee 2004).

Management goal

The goal of Feral Pig management at the regional scale is Asset based protection (manage sites and manage pest animal populations). However, this varies slightly for each of the local populations / management areas identified (Table 5.9a-5.9b).

Regional management focus

Feral Pig distribution within the North Coast is in general restricted to areas that have a suitable habitat and this is primarily areas of swamp/wetlands or river systems. Many areas of the region could potentially provide Feral Pig habitat but are currently free of feral pigs. Control in many instances is made difficult due to problems in gaining access to the areas that feral pigs inhabit and engagement of land managers.

North coast management will focus on:

- identifying high risk areas and their management requirements
- managing isolated sites with a view to containment (and eradication where possible)
- assisting land managers with control.

Expectations of land managers

All land managers can reduce risks from Feral Pig populations on land under their care and control, by undertaking activities:

- Where the management goal is containment, that:
  - ◊ minimise or eliminate the impacts of feral pigs on their land
  - ◊ prevent the spread of feral pigs onto other parts of the region.
- Where the management goal is asset protection, that:
  - ◊ reduce the risk of feral pigs being released into the environment
  - ◊ reduce the risk of feral pigs accessing easy food and shelter on their land
  - ◊ reduce the negative impacts of feral pigs on priority assets on their land and neighbouring lands.

Examples of activities a land manager could undertake to achieve to these outcomes are:

- participating in coordinated pest animal control programs
- undertaking management activities that incorporate both initial and follow up pest animal control
- reporting any Feral Pig activity (sightings, signs of presence, impacts) to neighbours and their local LLS Biosecurity ranger (and/or via FeralScan)
- ensuring potential food sources such as carcasses, offal and food scraps are properly disposed of
- report any deliberate release of feral pigs (or other suspicious activity) to the DPI Invasive Plants and Animals Enquiry Line.

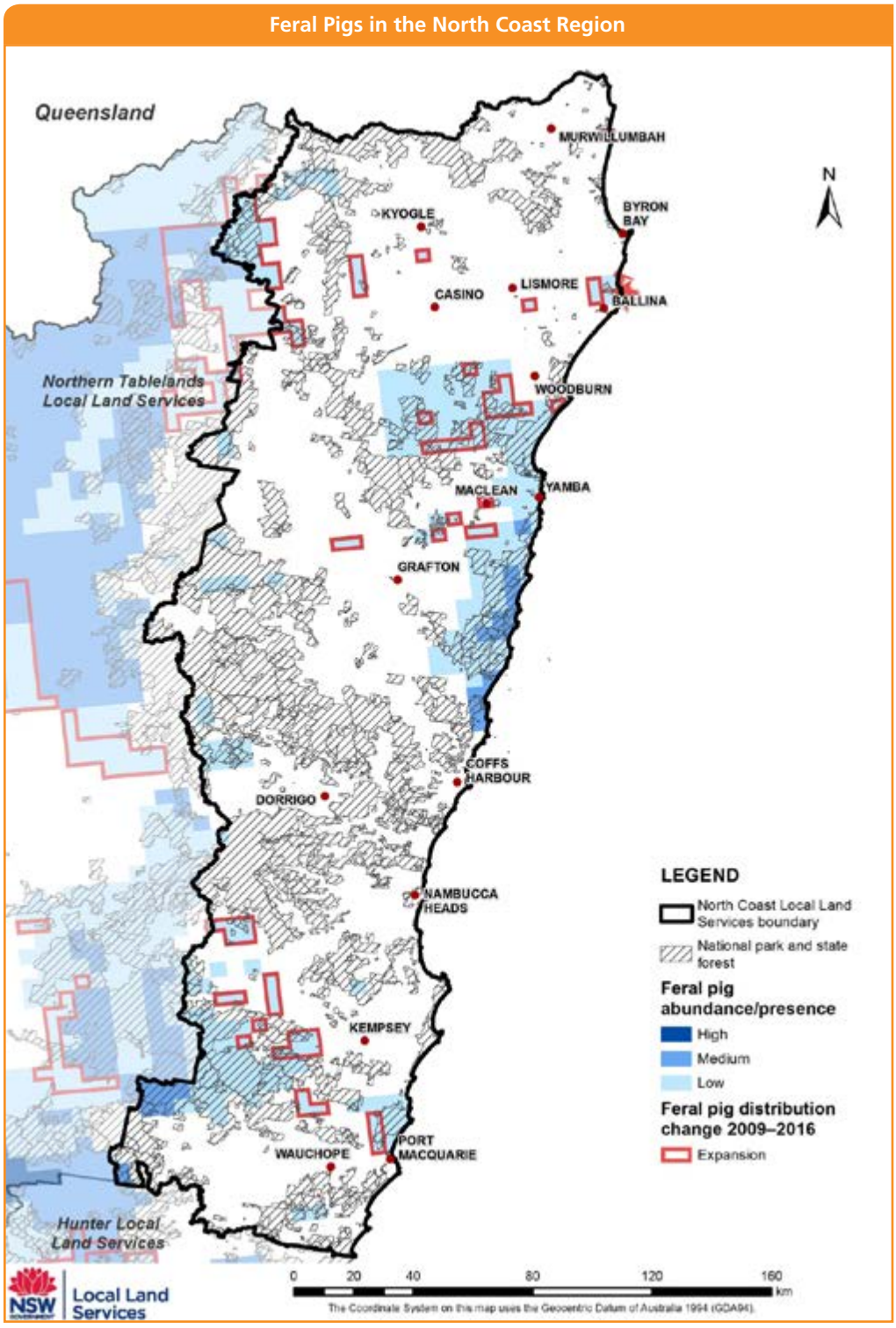


Figure 5.5. Feral Pig distribution in the North Coast region (DPI 2016).

Table 5.9a. Feral Pig management programs for sub-regional management areas.

Program Name / Area	Objectives	Management Goal	Assets	Activities	Key stakeholders
Population Areas: **A. Coastal NP and SF and Bungawalbin areas,** **B. Upper Clarence** **and** **C. Upper and Lower Hastings.**	Protect horticulture and grazing assets. Protect wetland and coastal conservation areas.	Asset Based Protection (Protect Sites & Manage Pest Animal Populations).	**Social** Aboriginal cultural sites, built assets, community safety. **Environmental** Freshwater wetlands, wildlife, high conservation sites. Priorities include Indigenous protected areas, Newrybar and Everlasting Swamps, Iluka NR World Heritage Area, threatened species e.g., Coastal Emu populations. **Economic** Rural production - macadamias, blueberries, pasture, cropping, cane, and tea tree.	FP1 Review and support existing Feral Pig programs and Local Plans (e.g., Newrybar, Upper Clarence, Bungawalbin). FP2 Establish Feral Pig groups and develop Local Plans in other priority areas. FP3 Implement priority actions from the Local Plans, including asset identification, coordinated management, and monitoring. FP4 Support strategic Feral Pig control in accordance with NPWS Upper Clarence and Newrybar Swamp and Bungawalbin Swamp Management Plans. FP5 Identify Native Title and cultural sites issues associated with Feral Pig management programs. FP6 Increase effective monitoring of feral pigs near key sites and assets.	North Coast LLS DPI OEH / NPWS Forest Corp Crown Lands Local Government Rural industries and producer groups Aboriginal Land Managers Private land managers Game Licensing Unit Local hunting clubs
D. Remaining areas where Feral Pig is absent or populations are mainly small and isolated	Implement surveillance programs Manage and contain population Protect priority agricultural and ecological sites	Containment (Contain Spread).	**Social** Built assets, community safety at urban / pig habitat interface. **Environmental** Freshwater wetlands, wildlife, high conservation sites. **Economic** Rural production - macadamias, blueberries, pasture, cropping, cane, and tea tree.	FP7 Surveillance and monitoring to locate any changes or new Feral Pig populations. FP8 Cooperative arrangements with stakeholders to manage threat of entry from Northern Tablelands. FP9 Develop management plans and implement control programs for new Feral Pig populations FP10 Develop and implement rapid response plans for new incursions. FP11 Support existing programs to monitor and remove feral pigs from priority areas (e.g., NPWS site specific management plans).	North Coast LLS DPI OEH / NPWS Forest Corp Crown Lands Local Government Rural industries and producer groups Aboriginal Land Managers Private land managers Game Licensing Unit Local hunting clubs

Table 5.9b. Feral Pig community engagement activities.

Outcome	Activity	Key stakeholders
Asset Protection Contain Spread	FP12 Run education and awareness programs (including land manager obligations under the *Biosecurity Act 2015*, promoting importance of reporting sightings, risks of free range pig farming, spread by piggers). FP13 Raise absentee land manager awareness of their obligations under the *Biosecurity Act 2015* and how they can participate effectively in local feral pig management.	North Coast LLS DPI Public Land Managers Private land managers

5.11 Wild Rabbit

Wild Rabbit distribution

Wild Rabbits occupy a wide range of habitats, including native and modified grasslands, woodland, heath and forest; can achieve high densities in some agricultural and suburban areas; and exhibit minimal or no dependence on humans to meet their ecological requirements (NSW Scientific Committee 2002). Rabbit distribution in the North Coast region is widespread but there are areas of absence, e.g., heavily vegetated escarpment and gorges (Figure 5.6). Feral rabbit competition and grazing are recognised as a key threatening process in NSW (NSW Scientific Committee 2002).

Management goal

The goal of Wild Rabbit management at the regional scale is Asset-based protection (manage sites) (Tables 5.10a-5.10b).

Regional management focus

Wild Rabbits are generally widespread throughout the North Coast but in low numbers that cause minimal impacts. Where they do cause impacts it is generally associated with infrastructure such as farm buildings where control in most instances is on an individual property level, and urban infrastructure such as buildings, termite barriers, stormwater systems where control and repair is expensive.

Environmental impacts include dietary competition with threatened species, grazing that may reduce survival of threatened plants, and dietary switching between Wild Rabbits and native species by introduced predators (fox and feral cats) in response to changes in rabbit populations. Recent releases of Rabbit haemorrhagic disease virus have had variable success with some areas reporting effective control and others no noticeable change.

Wild Rabbit management on the North Coast will focus on:

- assisting land managers to comply with control requirements
- coordinating release of Rabbit haemorrhagic disease virus to provide landscape management.

Expectations of land managers

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

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

Examples of activities a land manager could undertake to achieve to these outcomes are:

- participating in coordinated pest animal control programs
- undertaking management activities that incorporate both initial and follow up pest animal control
- reporting rabbit activity (sightings, signs of presence, impacts) to their local LLS Biosecurity ranger (and/or via FeralScan).

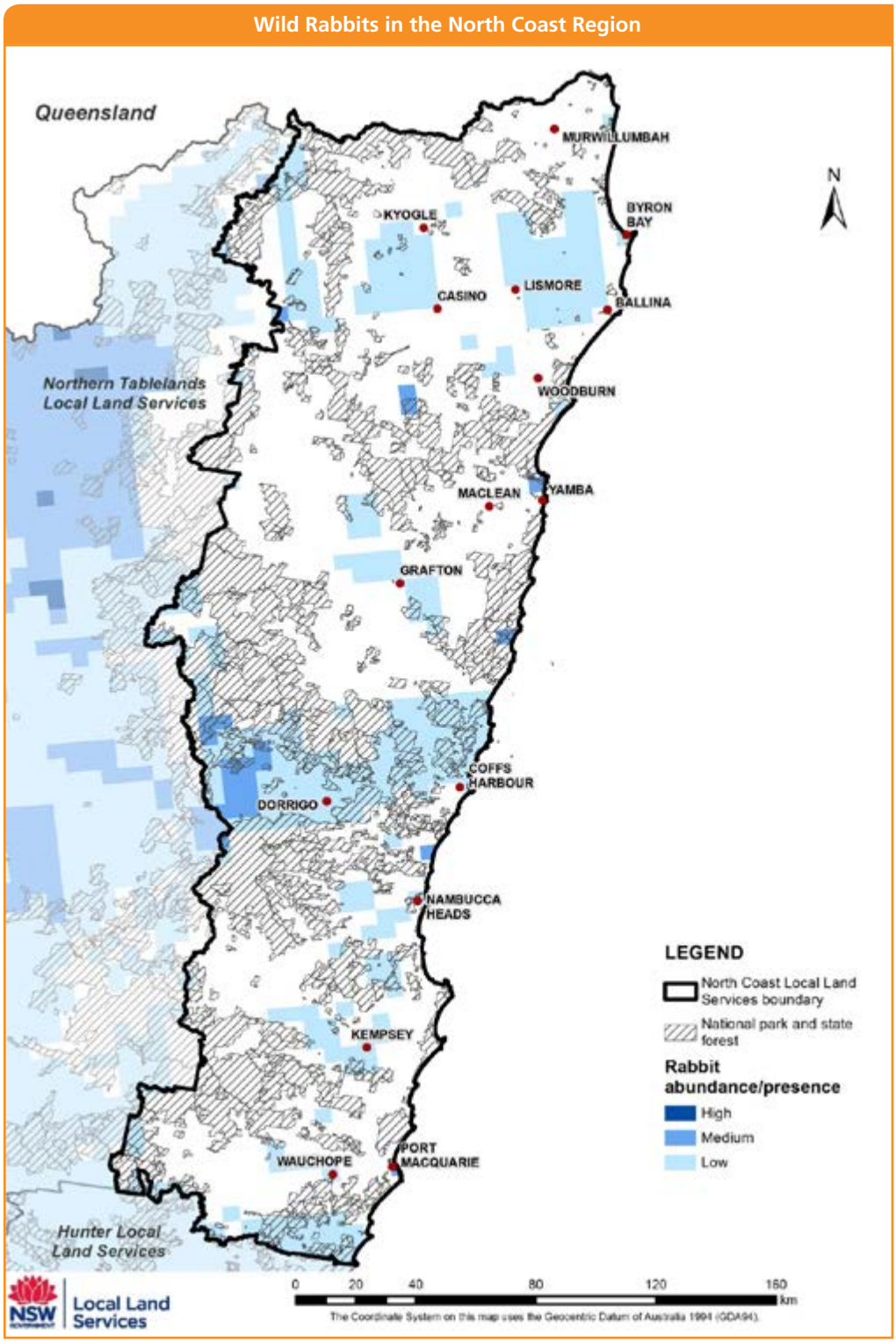


Figure 5.6. Wild Rabbit distribution in the North Coast region (DPI 2016).

Table 5.10a. Wild Rabbit regional management programs.

Program Name / Area	Objectives	Management Goal	Assets	Activities	Key stakeholders
North Coast LLS region	Promote farm management strategies Protect threatened species habitat	Asset Based Protection - Manage Sites	**Social** Heritage sites (e.g., Byron lighthouse, infrastructure). **Environmental** Competition and grazing by rabbits impacts on indigenous and threatened fauna species that prefer green grass and herbage; reduces survival and recruitment of several threatened plant species; and may affect the structure and composition of vegetation communities. Priority sites include Mount Hyland, New England, Cathedral Rock, Iluka WHA, Cudgen NP/NR. Rabbits are also eaten by Red Foxes and feral cats and can maintain those populations. **Economic** Erosion and topsoil loss due to removal of vegetation, e.g., Cudgen prime rural land. Damage and feeding on horticulture, nursery products, crops. Damage to urban and rural infrastructure, e.g. bridges, farm buildings and the high costs of repair.	R1 Identify priority environmental, economic and infrastructure assets and locations in the region where rabbit management will have most benefit. R2 Develop, or support existing, Local Management Plans for priority rabbit areas (e.g. burrow fumigation, maintaining northern rabbit barrier, cross-border programs with Northern Tablelands and South-east Queensland partners. R3 Support implementation of priority actions in Local Management Plans. R4 Increase effective rabbit management options available by supporting Research and Development R5 Support innovative management, e.g., cross-tenure broad-scale management, bio-control, virus release, exclusion fencing, restrictions on sale, etc. R6 Support the investigation of legislative mechanisms to improve the management of pet rabbits. R7 Support management and awareness programs that reduce the biosecurity threat of domestic rabbits becoming feral.	North Coast LLS DPI Local Government OEH / NPWS Public land managers Rural industries Private land managers

Table 10.b. Wild Rabbit community engagement activities.

Outcome	Activity	Key stakeholders
Asset Protection	R8 Promote best practice rabbit control to private and public land managers. R9 Community awareness programs to increase understanding of impacts, and appropriate domestic rabbit care. R10 Run education and awareness programs including land manager obligations under the *Biosecurity Act 2015* (e.g. general biosecurity duty obligations, mandatory measures, restrictions on pet sales). R11 Raise absentee land manager awareness of their obligations under the *Biosecurity Act 2015* and how they can participate effectively in local rabbit management.	North Coast LLS DPI Rural industries Private land managers

5.12 Wild Dog

Wild Dog distribution

Wild Dogs are present throughout the North Coast region, usually at medium densities (Figure 5.7). They are found in residential and peri-urban areas, on small, private blocks, on neighbouring agricultural lands (including leased and licensed land), in livestock production areas, crown lands, public estates, parks and reserves. Predation and hybridisation by Wild Dogs are recognised as a key threatening process in NSW (NSW Scientific Committee 2009).

Management goal

The goal of Wild Dog management at the regional scale is Asset based protection (manage pest animal populations). Australian dingoes are not an unequivocally defined species or sub-species, and so dingoes of any kind do not meet the criteria for listing as a threatened species (Allen et al. 2017). This means that they can be controlled where they are considered to be a pest.

Management strategies focus on asset protection. However as both wild dogs and the assets (e.g. people, livestock, domestic pets, native fauna) are widespread throughout the region and wild dogs have the ability to repopulate management areas in a short time period, there is a need for tenure neutral, partnership based, landscape scale strategies that address both current and future impacts. (Tables 5.11a-5.11b).

Regional management focus

A North Coast Regional Wild Dog Management Plan (NCLLS 2015) has been prepared. It is consistent with the national and State plans, guides regional management, and is the main tool to implement Wild Dog management under this Regional Strategic Pest Animal Management Plan.

The balance between Wild Dog management and Dingo conservation is an important consideration in the region. The primary focus of Wild Dog management is reducing the negative impacts of wild dogs on commercial livestock (cattle and sheep) and hobby farms (cattle, sheep and other small ruminants) across the region. In doing so, finding a balance between managing wild dogs in areas where they have negative impacts and conserving dingoes is important.

The NSW Wild Dog Management Strategy 2017-2021 (DPI 2017) promotes a balance between managing wild dogs in areas where they have negative impacts, and preserving the ecological role of dingoes. *Strategy 1.2.2 Conservation of dingoes* in the NSW Wild Dog Management Strategy requires that this plan and regional Wild Dog Management Plans focus control on areas where the risk of negative impacts are greatest, and not undertake control in parts of the landscape where the risk of negative impacts from wild dogs is low, which allows wild dogs to fulfil their natural ecological role.

Involvement of relevant local stakeholders in the development of cooperative and tenure neutral local Wild Dog management plans will be important to achieving balanced social, economic and environmental outcomes.

The focus on this plan is:

- to develop local Wild Dog plans
- to raise land manager awareness of their obligations of undertaking Wild Dog control in key areas identified in local plans
- to promote effective cross tenure, cooperative asset protection strategies and landscape scale management programs that address impacts.

Expectations of land managers

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

- reduce the risk of wild dogs accessing easy food sources and shelter on their land
- reduce the negative impacts of wild dogs on priority assets on their land and neighbouring lands.

Examples of activities a land manager could undertake to achieve to these outcomes are:

- participating in coordinated pest animal control programs
- undertaking management activities that incorporate both initial and follow up pest animal control
- reporting any wild dog activity (sightings, signs of presence, impacts, attacks) to neighbours and their local LLS Biosecurity ranger (call LLS on ph: 1300 795 299) (and/or via FeralScan scan)
- ensuring potential food sources such as carcasses, offal and food scraps are properly disposed of.

Wild Dogs in the North Coast Region

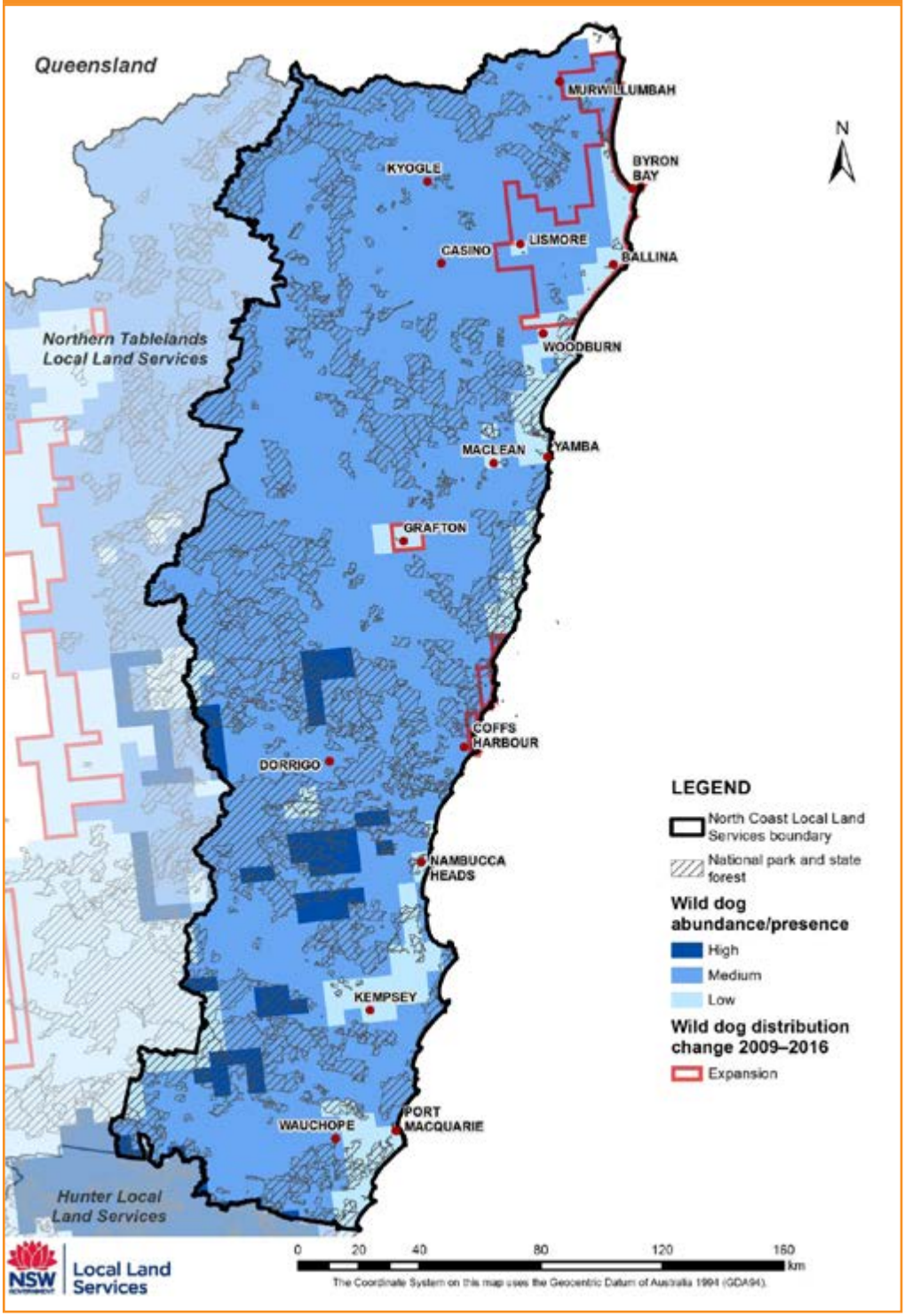


Figure 5.7. Wild Dog distribution in the North Coast region (DPI 2016).

Table 5.11a. Wild Dog regional management programs.

Program Name / Area	Objectives	Management Goal	Assets	Activities	Key stakeholders
North Coast LLS Region	Ensure human health and well-being. Increase land manager participation in wild dog management Minimise livestock losses. Build knowledge that improves determination of Dingo conservation status	Asset Based Protection (Manage Pest Animal Populations).	**Social** Attacks on humans; human mental health impacts due to loss, attacks and stalking; spread of disease to humans; domestic pet attacks; airstrikes and tourism. **Economic** Loss of livestock and reproduction rates (via Neospora protozoa and Hydatid tapeworm infection); economic impact of control on farmers; potential loss of producer certification due to disease spread, damaged infrastructure and fences due to wild dog herding of cattle. **Environmental** native wildlife and ecosystem function, including threatened species and ecological communities influenced by wild dogs as top order natural predator	WD1 Facilitate Local Wild Dog Management Planning in priority areas. WD2 Support public land managers in preparing management plans to maintain ecological role and genetic integrity of Wild Dog / Dingo in conservation reserves (former "schedule 2" land) and address Wild Dog management. WD3 Promote effective cross tenure asset protection strategies and landscape scale management programs as appropriate to the impacts. WD4 Promote cooperative approaches by all land managers and monitor the need for compliance and enforcement. WD5 Investigate funding and coordination of aerial baiting where asset protection outcomes can be achieved. WD6 Support management and awareness programs that reduce the threat of roaming domestic dogs to livestock and wildlife, the issues they cause around urban areas, and their contribution to Wild Dog populations. WD7 Promote and facilitate funding and research programs to improve effectiveness of management options. WD8 Explore non-lethal strategies to mitigate Wild Dog attacks on stock. WD9 Monitor changes in Wild Dog numbers and livestock impacts. WD10 Monitor population responses of Wild Dog, as well as threatened species and other native fauna, to control programs. WD11 Establish one point of reporting to monitor, evaluate and report to inform and improve Wild Dog management.	North Coast LLS DPI OEH / NPWS Forest Corp Crown Lands Local Government Rural industries and producer groups Aboriginal Land Managers Private land managers

Table 5.11b. Wild Dog community engagement activities.

Outcome	Activity	Key stakeholders
Asset Protection	WD12 Promote greater land manager participation in Wild Dog management through awareness, and assess the need for compliance programs. WD13 Support the formation of Wild Dog Management Associations / Groups. WD14 Increase / improve reporting of stock losses and sightings. WD15 Wild Dog management workshops and education and awareness programs to: a) engage the large land managers, local Government, smaller holdings and peri-urban communities b) training in safe control methods c) promote best practice control d) communicate land manager obligation changes from Pest Control Order to Biosecurity legislation and general biosecurity duty. WD16 Raise absentee land manager awareness of their obligations under the *Biosecurity Act 2015* and how they can participate effectively in local Wild Dog management.	North Coast LLS DPI Public land manager Local Government Rural industries and producer groups Aboriginal Land Managers Private land managers

5.13 Lord Howe Island pest animal programs

As an isolated oceanic island, Lord Howe Island has had a very different history of pest invasion to the mainland and presents unique opportunities for pest management and eradication. The pest animal priorities identified by the North Coast Regional Pest Animal Committee, and within sections 5.1-5.12 above, are very different to the Lord Howe Island pest animal priorities.

The North Coast Regional Pest Animal Committee considered approximately 70 species for inclusion in this plan. Those that are relevant to Lord Howe Island are listed in Table 5.12. Several of the mainland priorities have been eradicated from the Island.

Refer to at http://www.lhib.nsw.gov.au/ **for the Lord Howe Island Biosecurity Strategy and species specific pest management documents.**

In addition, Lord Howe Island specific provisions are being considered under the NSW Biosecurity legislation, and may include the listing of certain species as Prohibited Matter.

Table 5.12 Lord Howe Island pest animal management status.

Common name	Lord Howe Island management status
Mammals	
Asian House Rat	Key sites include Lord Howe Island, Muttonbird and South Solitary Island. The Black Rat is a high priority for eradication on LHI.
Black Rat	
Brown Rat	
Feral Cat	Feral Cat was assessed as a priority pest animal for the region by NC RPAC. Eradicated from LHI 1980's.
Feral Goat	Feral Goat was assessed as a priority pest animal for the region by NC RPAC. Eradicated from LHI in 2013.
Feral Pig	Feral Pig was assessed as a priority pest animal for the region by NC RPAC. Eradicated from LHI 1980s.
House Mouse	The House Mouse is a high priority for eradication on LHI. Low priority for remainder of the region.
Wild Rabbit	Wild Rabbit was assessed as a priority pest animal for the region by NC RPAC. A priority for prevention on LHI.
Birds	
Common Blackbird	Potential to eradicate from LHI.
European Goldfinch	Vagrant on LHI, very low risk.
European Starling	Present on LHI. Similar impacts and management to Indian Myna but currently represents a lower risk.
European Greenfinch	Vagrant on LHI, very low risk.
Indian Myna	Indian Myna was assessed as a priority pest animal for the region by NC RPAC. A priority for prevention on LHI.
Mallard	Present on LHI, ongoing control.
Masked Owl	High priority for eradication from LHI.
Rock Dove / Feral Pigeon	Present on LHI, ongoing control or potential to eradicate, but likely to reinvade.
Song Thrush	Present on LHI at low numbers.
Amphibians	
Bleating Tree Frog	Present on LHI and considered pest.
Cane Toad	Cane Toad was assessed as a priority pest animal for the region by NC RPAC. High priority for prevention of incursion to LHI.
Reptiles	
Asian House Gecko	High priority for prevention of incursion to LHI.
Delicate Grass Skink	Present on LHI.
Eastern Snake-necked Turtle	Present at very low density on LHI.

5.14 Implementing this plan

The North Coast Regional Pest Animal Committee

The North Coast Regional Pest Animal Committee will work with Local Land Services to implement the plan, according to the roles identified in Table 5.13. Where cross-boundary pest management issues arise, the North Coast LLS Board will be engaged to resolve them.

Table 5.13. North Coast Regional Pest Animal Committee roles.

North Coast Regional Pest Animal Committee roles
1. Identify Lead stakeholder, and Support stakeholders for each of this plan's actions to ensure action delivery.
2. Identify and communicate which of the plan's priorities will be implemented first and determine where funding needs to be sourced for unfunded priorities.
3. Support the functions and business needs of the State Pest Animal Committee.
4. Engage with land managers to raise awareness of their obligations under the *Biosecurity Act 2015* and how they can participate effectively in local pest management.
5. Support local groups in the development and implementation of new local pest animal management plans, and the update of existing local pest animal management plans.
6. Work collaboratively and engage with all sectors to identify synergies, options for sharing resources and information, partnership and funding opportunities, and cooperative pest program delivery.
7. Liaise with neighbouring regional pest committees to promote effective co-ordination of pest management across regions, agencies and tenure, and resource and information sharing.
8. Support development and implementation of standard local monitoring, data capture (including mapping), and reporting protocols.
9. Support evaluation of pest control activities to inform management actions and planning.
10. Carry out mid-term and final reviews of this plan.

Local planning

North Coast LLS will work with the Regional Pest Animal Committee to develop a framework for local pest animal management plans, which will capture:

- the local groups involved in decision making, and how balanced outcomes will be achieved
- delivery roles and responsibilities and how sharing responsibility across tenures will occur
- justification for the use of existing funds and the application for additional funds
- evidence that justifies management actions (e.g., pest distribution, activity, impacts, local risk)
- control techniques and humane practices, timing of control activities
- community engagement and communication processes
- monitoring approaches and data storage and reporting requirements
- measures of success and key performance indicators that reflect local conditions.

Stakeholder involvement

This plan embraces the need for new directions in pest control, and so presents priorities that will be addressed within existing funding, and priorities that provide much needed direction to the sourcing of alternate funding.

The plan will be resourced from within existing budgets, where allocation will initially be guided by priorities that provide the best return on investment; balance environmental, economic and social considerations; and, are best supported by the capacity and effectiveness of partners involved.

The actions in this plan will be implemented using a staged approach. The Regional Pest Animal Committee will prioritise which of the plan's actions need to implemented immediately (i.e., those that address legislative requirements, and deliver existing plans), and which actions can be implemented at later stages (e.g. development of better control techniques).

Key stakeholders have an interest in delivery of priority actions. This interest spans from being involved in refining priority actions, to further developing processes to address actions, through to participating in the on-ground delivery of the plan.

Resourcing of pest management is unpredictable and will fluctuate, and stakeholders also differ in their capacity to provide pest management resources. It is recognised that commitments and capacity may be contingent upon availability of resources.

Pest animal best management practice

The plan supports the development of a local planning framework that will guide best practice engagement and on-ground delivery that is tailored to local conditions. Well established best management practice is documented for a number of pest species and management tools (see the PestSmart and NSW DPI webpages). However, best management practice (BMP) for some pest species is still not known, or is in the early stages of development, and this plan seeks to address those knowledge and practice gaps.

This plan recognises the following key aspects of best practice, where management:

- brings people together to collectively meet their general biosecurity obligations, using a range of integrated best practice control techniques (including commercial use where appropriate)
- provides the best return on investment
- provides balanced social, economic and environmental outcomes (by having all relevant stakeholders involved in the decision making that underpins local on-ground pest management)
- meets community perceptions, including emergency needs
- varies according to location, asset under threat, and pest species
- considers interactions amongst pest species and accounts for local conditions.

6. Measuring success and continuous improvement

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

- assess whether the plan is achieving its goals and outcomes
- identify priorities for immediate and future management planning
- evaluate previous or current programs (including both control and community engagement activities)
- improve understanding and knowledge about pest animal current and potential range and their impacts
- raise community awareness of current and potential problems and opportunities for prevention and control
- demonstrate to community, investors and stakeholders that the plan's strategies are sound and effective.

Objectives and performance indicators are set for each of the pest programs outlined below in Section 6.1.2.

6.1 Key performance indicators

Key performance indicators (KPIs) have been set to ensure practices are effective and achieving outcomes. These are focussed at a regional scale to ensure that program implementation delivers effective outcomes for the pest animals outlined in the plan.

State-wide objectives and metrics for key species and goals will be formulated over the next 12 months to ensure a collaboration of regional planning efforts. These state-wide objectives will align with overarching goals and objectives set across plans and will be informed by overarching plans such as the NSW Invasive Species plan and NSW Biosecurity Strategy.

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

6.1.1 State-wide KPIs

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

KPIs have been set at the State level (Table 6.1). They will guide development of State based MERI processes.

Table 6.1. State-wide performance indicators.

Objective	Indicator	Timeframe
Develop consistent state-wide pest animal data metrics	Metrics developed Regional Pest Animal Committees report on metrics in a consistent manner	Implemented by July 2019
Develop a consistent monitoring, evaluation, reporting and implementation process for Regional Strategic Pest Animal Management Plans	MERI process established to guide monitoring and management of pest animals in NSW for oversight by State Pest Animal Committee	Implemented by July 2019

6.1.2 Program KPIs

KPIs have been set at the Regional level for individual pest animal management programs. (Table 6.2). They will inform Regional Program reporting.

The development of locally specific KPIs for the social, economic and environmental impact of pests, and for pest distribution and density for some pest species will occur as part of local pest management planning.

Table 6.2. Summary of Key Performance indicators for pest animal management programs.

Objective	Key Performance Indicator	Timeframe
Cane Toad		
Maintain status of exclusion zone Protect key environmental assets	• Stakeholders involved in decision making • People taking part in control activities • Community programs delivered • Land managers implementing pest BMP • New incursions identified • Rapid response protocols implemented • Regional communication and engagement products distributed	Annually Or As determined in local pest management plans
Feral Cat		
Protect threatened species Improve cat owner awareness and behaviour	• Stakeholders involved in decision making • People taking part in control activities • Land managers implementing pest BMP • Collaborative programs delivered • Different methods, tools, best practice guidelines tested • Regional communication and engagement products distributed	Annually Or As determined in local pest management plans
Wild Deer		
Increase public safety Protect priority agricultural and ecological sites Contain with the aim of eradication Implement surveillance programs Support programs protecting key environmental assets	• Stakeholders involved in decision making • People taking part in control activities • Land managers implementing pest BMP • Area under pest BMP • Collaborative programs delivered • Pest distribution and/or density decreased • Traffic incidents reported • Regional communication and engagement products distributed	Annually Or As determined in local pest management plans
European Red Fox		
Protect rural and livestock assets Protect threatened shorebirds and other threatened species	• Stakeholders involved in decision making • People taking part in control activities • No. of land managers implementing pest BMP • Area under pest BMP • Collaborative programs delivered • Pest distribution and/or density decreased • Regional communication and engagement products distributed	Annually Or As determined in local pest management plans
Feral Goat		
Protect livestock from disease Minimise environmental impacts on National Parks	• Stakeholders involved in decision making • People taking part in control activities • Land managers implementing pest BMP • Rapid response protocols implemented • Collaborative programs delivered • Regional communication and engagement products distributed	Annually Or As determined in local pest management plans

Objective	Key Performance Indicator	Timeframe
Wild Horse		
Increase public safety Minimise environmental and agricultural impacts in Guy Fawkes and Yuragir areas Implement surveillance programs Increase public awareness Protect priority ecological sites	• Stakeholders involved in decision making • People taking part in control activities • Collaborative programs delivered • Land managers implementing pest BMP • Monitoring, surveillance and reporting undertaken • Traffic incidents reported • Regional communication and engagement products distributed	Annually Or As determined in local pest management plans
Indian Myna		
Promote pest bird management practices Protect priority agricultural, ecological and community sites	• Stakeholders involved in decision making • People taking part in control activities • Land managers implementing pest BMP • Pest distribution decreased • Regional communication and engagement products distributed	Annually Or As determined in local pest management plans
Feral Pig		
Protect horticulture and grazing assets Protect wetland and coastal conservation areas Implement surveillance programs Manage and contain populations Protect priority agricultural and ecological sites	• Stakeholders involved in decision making • People taking part in control activities • Land managers implementing pest BMP • Area under pest BMP • Collaborative programs delivered • Regional communication and engagement products distributed	Annually Or As determined in local pest management plans
Wild Rabbit		
Promote farm management strategies Protect threatened species habitat	• Stakeholders involved in decision making • People participating in control activities • Land managers implementing pest BMP • Area under pest BMP • Collaborative programs delivered • Regional communication and engagement products distributed	Annually Or As determined in local pest management plans
Wild Dog		
Ensure human health and well-being. Increase land manager participation in wild dog management. Minimise livestock losses. Build knowledge that improves determination of dingo conservation status.	• Stakeholders involved in decision making • People taking part in control activities • Land managers implementing pest BMP • Area under pest BMP • Local wild dog management plan completed • Collaborative programs delivered • People-wild dog incidents reported • Livestock losses reported • Regional communication and engagement products distributed	Annually Or As determined in local pest management plans
Alert species		
Protect environmental, economic and social values	• Stakeholders involved in decision making • People taking part in control activities • New incursions identified • Rapid response protocols implemented • Risk assessment updates completed • Regional communication and engagement products distributed	Annually Or As determined in local pest management plans

6.2 Measuring performance

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

6.3 Plan review

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

7. The *Biosecurity Act* and legal framework

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

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

The *Biosecurity Act 2015* includes a number of mechanisms (regulatory tools) that can be used to manage biosecurity risks such as pest animals in NSW. Land managers, industry and community should be familiar with these tools and what they require of them in their daily practices (Figure 7.1).

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

Regulatory tools: NSW Biosecurity Act 2015

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

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

Biosecurity Management Tools

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

Figure 7.1. Regulatory tools of the Biosecurity Act 2015.

8. Further information

Plan to manage biosecurity risks

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

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

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

Educate yourself

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

Resources:

- Local Land Services (ph: 1300 795 299, https://northcoast.lls.nsw.gov.au/; email admin.northcoast@lls.nsw.gov.au)
- Office of Environment and Heritage (National Parks and Wildlife)
- Department of Primary Industries
- Invasive Animals CRC
- PestSmart Connect
- FeralScan.

Monitor your environment

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

Comply

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

Appendix 1: Prioritisation process

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

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

Generalised invasion curve showing actions appropriate to each stage

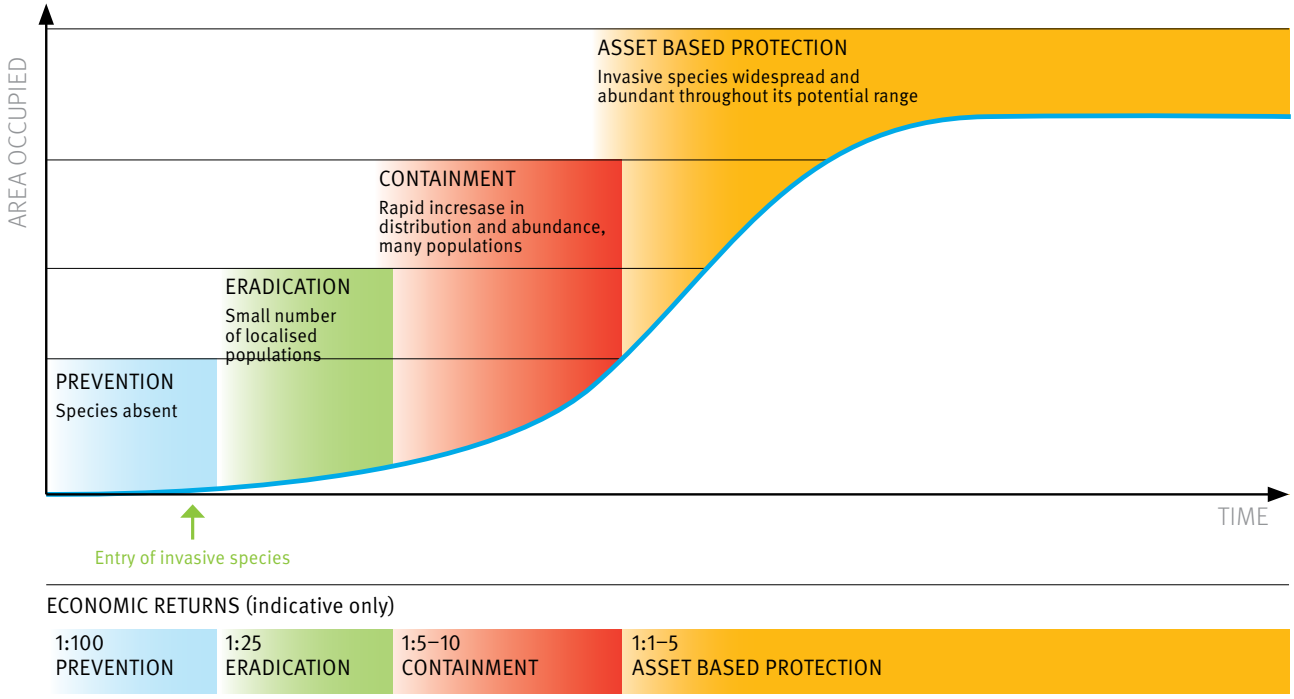


Figure A1. The 'Invasion Curve', showing the importance of allocating resources to prevent the establishment of new pests (Invasion Curve sourced from NSW Invasive Species Plan 2018-2021 and Department of Primary Industries, Victoria).

In identifying priority pest animals the North Coast Regional Pest Animal Management Committee applied an 'expert panel' approach to the assessment of 64 terrestrial and freshwater aquatic exotic pest animals that have established wild populations in NSW. Additional species relevant to Lord Howe Island were also considered.

The South Australian Pest Animal Risk Management Guide and prioritisation tool was then applied to the regional priorities:

http://pir.sa.gov.au/_data/assets/pdf_file/0017/254222/SA_pest_animal_risk_assessment_guide_Sept2010.pdf

The South Australian prioritisation tool accounts for pest animal impacts and the feasibility of effectively reducing those impacts and allocates management of particular pest animals in particular areas into one of four categories: Limited Action, Asset-based Protection, Containment or Eradication.

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

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

Apart from the species that are known to present very high risk (i.e., the Red Imported Fire Ant and Big Headed Ant), this plan did not consider invertebrate pests.

References

Allen, B.L., Allen, L.R., Ballard, G., Jackson, S.M. and Fleming, P.J.S. (2017), A roadmap to meaningful dingo conservation. Canid Biology & Conservation 20(11):45-56.

Australian Government (2013), Threat abatement plan for predation by the European Red Fox – Five year review. Department of the Environment.

Department of Primary Industries NSW (2016), The pest animal data has been sourced from NSW Government agencies and collated by the NSW Department of Primary Industries in 2016.

Department of Primary Industries NSW pest animal species list (2018), Provided to Local Land Services regions for Regional Pest Animal Plan development.

Hanke, Bill (2013), Response Strategies for the Common (Indian) Myna. Canberra Indian Myna Action Group.

Invasive Plants and Animals Committee (2016), Australian Pest Animal Strategy 2017 to 2027, Australian Government Department of Agriculture and Water Resources, Canberra.

Lord Howe Island Board (LHIB 2016), Lord Howe Island Biosecurity Strategy 2016. Prepared for the Lord Howe Island Board by AECPM Pty LTD, Townsville, Australia.

Natural Resources Commission (2014), Weeds – Time to get serious. Review of weed management in NSW. Final report and recommendations May 2014. Natural Resources Commission, Sydney, NSW.

Natural Resources Commission (2016), Shared Problem – Shared Solution. Review of pest animal management in NSW. Final report August 2016. Natural Resources Commission, Sydney, NSW.

North Coast Local Land Services (2015), North Coast Regional Wild Dog Management plan 2015-2020, North Coast Local Land Services, Grafton.

North Coast Local Land Services (2016a), North Coast LLS Local Strategic Plan 2016-2021, North Coast Local Land Services, Grafton.

North Coast Local Land Services (2016b), North Coast LLS Aboriginal Engagement Plan 2016-18, North Coast Local Land Services, Grafton.

North Coast Local Land Services (2016c), Hastings Wild Deer Management Strategy 2016-2018, North Coast Local Land Services, Grafton.

NSW Department of Industry (2017), NSW Wild Dog Management Strategy 2017-2021. NSW Government.

NSW National Parks and Wildlife Service (2006), Guy Fawkes River National Park: Horse Management Plan. Department of Environment and Conservation NSW, Sydney South

NSW Scientific Committee (1998), Predation by the European Red Fox – key threatening process. Final determination.

NSW Scientific Committee (2000), Predation by feral cats – key threatening process. Final determination.

NSW Scientific Committee (2002), Competition and grazing by the feral Wild Rabbit – key threatening process. Final determination.

NSW Scientific Committee (2004), Competition and habitat degradation by the Feral Goat – key threatening process. Final determination.

NSW Scientific Committee (2004), Competition, habitat degradation and disease transmission by the Feral Pig – key threatening process. Final determination.

NSW Scientific Committee (2005), Herbivory and environmental degradation caused by feral deer – Key threatening process. Final determination.

NSW Scientific Committee (2009), Predation and hybridisation caused by Wild Dogs – Key threatening process. Final determination.

NSW GOVERNMENT

North Coast
Regional Pest Animal Management Plan
2018 - 2023