



Central Tablelands Local Land Services - Wild dog management plan 2021-2026

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Disclaimer: The information contained in this publication is based on knowledge and understanding at the time of writing March 2021. 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.

Executive Summary

This Plan sets out how private land managers, the community and Government will strive to achieve cooperative management of wild dogs within the Central Tablelands Local Land Services (CTLLS) region. This Plan provides the strategic context for operational investment and prioritisation.

Effective wild dog management requires a strategic and proactive approach where private and public land managers work together to deliver wild dog control measures across the landscape, regardless of its tenure. The focus of wild dog management is on reducing the negative impacts of wild dogs on commercial livestock enterprises, peri-urban areas and populations of wildlife, including threatened species.

CTLLS will support land managers to fulfil their obligations to manage pest animals and encourage a collaborative and integrated approach by offering technical advice and support and acting as a conduit between relevant stakeholders.

The Plan articulates desired outcomes, objectives and actions to address and manage the impacts of wild dogs across the CTLLS region. These actions are based on the principles of pest animal management being, prevention, eradication, containment and asset protection.

This Plan identifies four key objectives, including;

- Objective 1: Promote and provide technical advice and resources to land managers in the CTLLS region
- Objective 2: Engage, support, and encourage community led coordinated and integrated wild dog control activities on a tenure-neutral basis
- Objective 3: Reduce the negative impacts caused by wild dogs
- Objective 4: Undertake integrated planning based on best available information and understanding of wild dogs.

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List of abbreviations

Abbreviation	Explanation
ABARES	Australian Bureau of Agricultural and Resource Economics and Sciences
AWI	Australian Wool Innovation
BC Act	NSW Biodiversity Conservation Act 2016
BCS	Biodiversity Conservation and Science
Biosecurity Act	NSW Biosecurity Act 2015.
CT RSPAMP	Central Tablelands Regional Strategic Pest Animal Management Plan 2018-2023.
CTLLS	Central Tablelands Local Land Services
CTLLS LSP	Central Tablelands Local Land Services Local Strategic Plan
EPBC Act	Federal Environment Protection and Biodiversity Conservation Act 1999
FCNSW	Forestry Corporation of NSW
GBMWA	Greater Blue Mountains World Heritage Area
LLS	Local Land Services
LLS SSP	Local Land Services State Strategic Plan
LPAP	Local Pest Animal Plan
NPWS	National Parks and Wildlife Service
NSW DPI	NSW Department of Primary Industries
NSWCL	NSW Crown Lands
NSWWDS	NSW Wild Dog Management Strategy
NWDAP	National Wild Dog Action Plan
PAct	Pesticides Act 1999
PAGs	Pest Animal Groups
PCA Act	Prevention of Cruelty to Animals Act 1979
RPAMC	Regional Pest Animal Management Committee
SPAC	State Pest Animal Committee

Introduction

In NSW, the term 'wild dog' refers to all wild-living dogs: dingoes, feral dogs and the hybrid descendants of these, all of which are currently considered to be *Canis familiaris* (DPI 2017).

The dingo is included in the definition of a wild dog because of their negative impacts on agriculture, biodiversity and social assets. The environmental and cultural significance of the dingo is recognised as are the legislative mechanisms in place to protect dingoes in specific areas, while ensuring livestock and wildlife are protected from predation.

Wild dogs are considered a serious established pest animal in Australia and are a designated "Priority Pest Species" in the Central Tablelands Regional Strategic Pest Animal Management Plan 2018-2023. (CT RSPAMP).

Through lost agricultural productivity via livestock predation, wild dogs have an impact of \$89 million on average, per year across Australia (<https://pestsmart.org.au/toolkits/wild-dogs/>).

Wild dog attacks impact on all forms of domestic livestock and cause serious emotional and psychological damage to land managers, their families and rural communities (Thompson et al 2013).

Predation by wild dogs on native fauna is a known or potential risk to at least 14 endangered or vulnerable native mammals, reptiles and bird species listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and is listed as a key threatening process under the NSW *Biodiversity Conservation Act 2016*.

This Wild Dog Management Plan (the Plan) has been prepared to ensure alignment with national and state approaches to best practice wild dog management.

Regional context

Agriculturally, the Central Tablelands region is highly diverse. Evenly spread summer and winter rainfall supports productive cropping systems; however, grazing is the most significant land use followed by irrigated farming, broad acre crops and horticultural enterprises including areas of fruit and vegetable growing and viticulture. Approximately seven per cent of the CTLLS region's population is employed in agriculture, fisheries and forestry.

The area has rich natural assets such as national parks, culturally significant areas and is home to a vast range of native fauna and flora with some of these being listed as threatened or endangered.

The region has a diverse range of industries including the major retail centers and university cities of Bathurst and Orange, mining operations around Orange, Lithgow and Mudgee and tourism operations including significant wineries at Orange, Cowra and Mudgee. A map of the CTLLS region is provided at Map 1.

Operational period

This plan is valid from 2021 to 2026 and will be reviewed every 24 months.

Scope and objectives of the Plan

The priorities for wild dog management in the CTLLS region are guided by the by the CT RSPAMP, with more specific actions outlined in this Plan, and the Local Pest Animal Management Plans (LPAMP), prepared by pest animal groups (PAGs).

This Plan guides the investment of resources and the management of wild dogs in the CTLLS region with the goal of reducing the impact of wild dogs on key assets with high economic, environmental and social value. It ensures

the focus of wild dog control is on areas where the risk of negative impacts are the greatest rather than across the entire area of wild dog distribution.

The Plan is also an important tool in clarifying what is required of all stakeholders in wild dog control and management. This aspect of the Plan is especially important in enabling land managers to meet their biosecurity duty.

Wild dogs can have large home ranges that cross multiple landholdings, both public and private, making it important for all land managers to approach wild dog management as a collective with a shared set of goals.

This Plan is committed to:

- improving the capacity and capability of land managers to manage wild dog issues, building effective partnerships and engaging the community
- working across the community in respect to wild dog management through participation in a shared responsibility model for wild dog management
- providing all land managers with access to technical expertise and tools for wild dog control
- assisting land managers to meet their obligations for wild dog control under the *NSW Biosecurity Act 2015*.

This plan delivers on four key objectives:

Objective 1: Promote and provide technical advice and resources to land managers in the CTLLS region

Objective 2: Engage, support, and encourage community led coordinated and integrated wild dog control activities on a tenure-neutral basis

Objective 3: Reduce the negative impacts caused by wild dogs

Objective 4: Undertake integrated planning based on best available information and understanding of wild dogs.

Legislative and strategic context for wild dog management

The law and wild dogs in NSW

What's a wild dog in NSW?

In NSW, the term 'wild dog' refers to all wild-living dogs: dingoes, feral dogs and the hybrid descendants of these, all of which are currently considered to be *Canis familiaris*. (DPI 2017) The biosecurity impacts of wild dogs are regulated under the *NSW Biosecurity Act 2015* (Biosecurity Act).

Who's responsible for managing wild dogs in NSW?

The Biosecurity Act says biosecurity is a shared responsibility between government, industry and communities. Under the Biosecurity Act people have a general obligation to be aware of their surroundings and take action to prevent the introduction and spread of pests, diseases, weeds and contaminants. This is known as general biosecurity duty.

The management of priority pest animals is largely achieved under the authority of the 'general biosecurity duty' (Part 3 of the Act), as a biosecurity duty (section 22) or as a mandatory measure (section 24). For wild dogs, the biosecurity duty means that both private and public land managers are required to control wild dogs to the extent necessary to minimise the risk of any negative impacts on their lands or that of their neighbours.

CTLLS provides assistance to land managers to achieve the outcomes of preventing, eliminating or minimising the biosecurity risks and impacts posed, or likely to be posed, by pest animals through a range of best practice management methods. Local Land Services also has a regulatory role under the Biosecurity Act meaning it will develop, implement and enforce pest animal management programs and activities which optimise the use compliance.

Alignment with state and federal policy

This Plan aims to deliver on the goals of the National Wild Dog Action Plan (NWDAP) and the NSW Wild Dog Management Strategy (NSWWDS) as they relate to the CTLLS region. It also delivers on the CT RSPAMP. The NWDAP identifies that wild dog management is best achieved collaboratively and by multiple stakeholders. This Plan adopts that approach. The relationship of this Plan to other relevant plans and policies is provided in Figure 1 below.

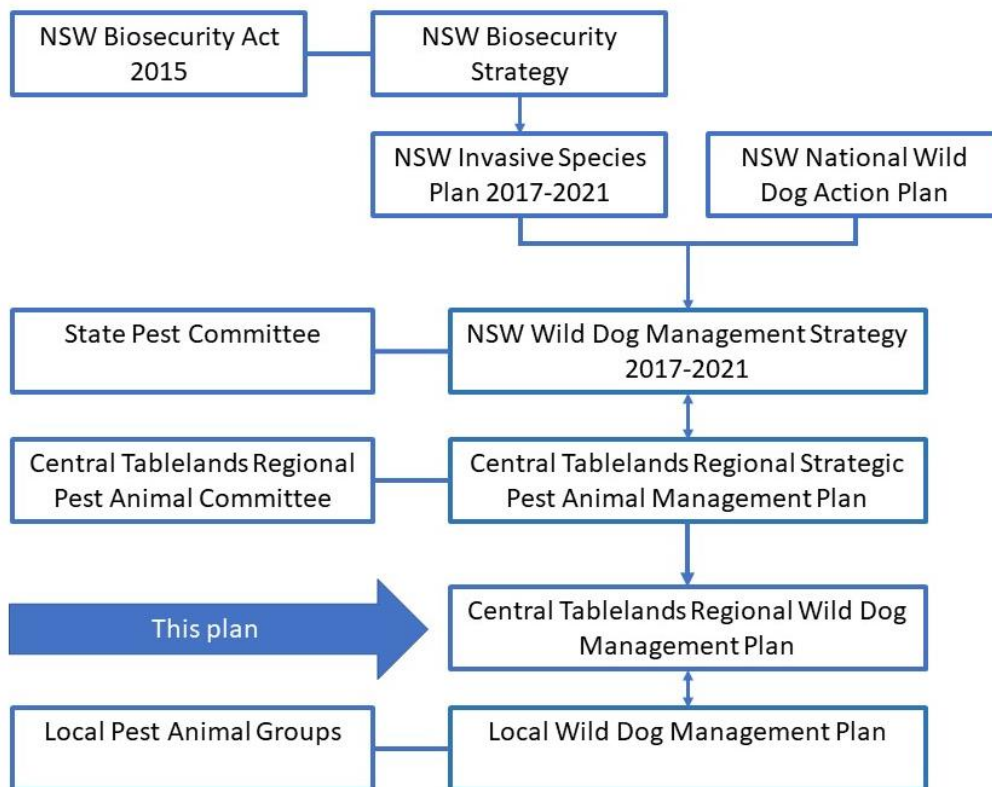


Figure 1. Alignment with biosecurity plans and policies

Alignment with Central Tablelands Local Land Services Local Strategic Plan

Managing wild dogs contributes to the achievement of outcomes identified in the CTLLS Local Strategic Plan (CTLLS LSP). Figure 2 provides line of sight between the objectives of this plan, the goals of the Local Land Services State Strategic Plan (LLS SSP) and outcomes of the CTLLS LSP.

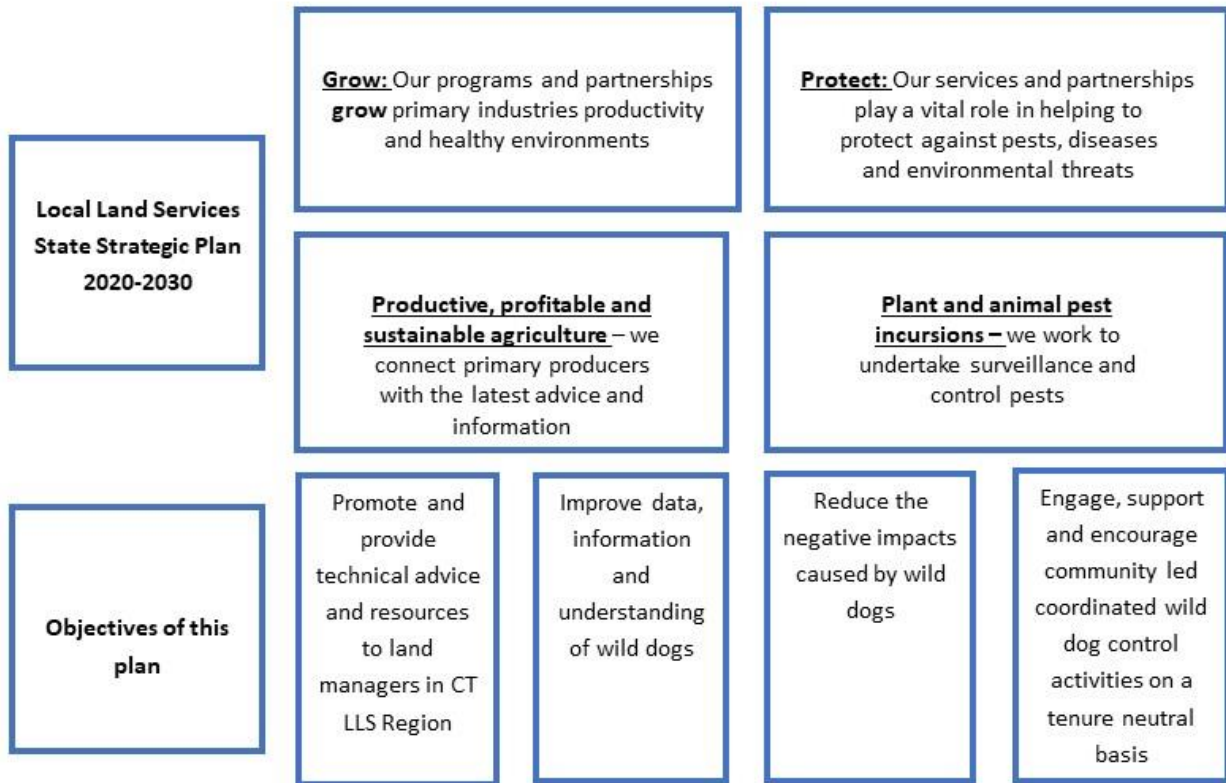


Figure 2. Alignment with CTLLS Strategic Plan outcomes and goals

Who’s involved in wild dog management in the region?

Agencies, land managers and landholders

In addition to agriculture, the CTLLS region contains a range of land uses including National Parks and Wildlife Service estate, , commercial native and pine forestry (public and private), major dams and foreshores and mining. These landuses are reflected in a diversity of tenure, and are often large parcels and holdings. In addition to private land managers, these agencies and corporations are key in delivering effective on-ground wild dog management.

CTLLS works closely with key advisory agencies and research institutions to ensure we are delivering and supporting best practice wild dog programs. Table 1 below provides a summary of the key agencies and stakeholders in wild dog management and their role. Map 2 provides an overview of land tenure, and demonstrates the importance of working collaboratively. Good working relationships and engagement of all relevant parties are critical to the success of wild dog management programs.

Table 1 describes four different types of activities and the relationship to key stakeholders.

On-ground: this means on-ground works and may include participation in regional control programs (baiting and trapping) or isolated control programs. The groups, agencies and corporations that undertake on-ground work are often land managers.

Advisory: this means providing advice about wild dog management and wild dog sightings within our region. This may include providing information on control methods, project design, dog sightings, training or field days.

Monitoring: wild dog management monitoring activities include infra-red surveys, camera trapping to survey dog activity, fauna surveys for prey species, abundance counts and radio tracking to understand key movement pathways within the landscape. Monitoring can be used to understand the impact of the control methods or to help to plan control programs.

Planning: this includes regional planning undertaken by the Regional Pest Animal Committee (RPAC), programming control activities undertaken by individual land holders and local scale control program planning undertaken by Pest Animal Groups and adjoining farms and neighbours.

Compliance: LLS and NSW DPI have a regulatory role under the Biosecurity Act meaning they will support, develop, implement and enforce pest animal management programs and activities which optimise compliance with the Act.

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Table 1. Agencies, groups and corporations involved in Wild dog Management

Agency/Corporation	On-ground	Advisory	Monitoring	Planning	Compliance	Comment
Central Tablelands LLS	X	X	X	X	X	CTLLS has delegated authority under the Biosecurity Act and the NSW <i>Pesticides Act 1999</i> (Pesticides Act). CTLLS plays an oversight role in pest animal management, providing training, information and support, and on-ground support through the provision of baits. We coordinate, prepare and undertake aerial programs and assist with group baiting and trapping programs. We facilitate the RPAC and annual planning for pest animal management in the region. We also have Authorised Officers under the Biosecurity Act who have a role in compliance and enforcement to ensure that land managers are fulfilling their biosecurity duty. We're not primarily a landholder, but do manage travelling stock reserves totalling 3,380 Ha.
National Parks and Wildlife Service	X	X	X	X		The National Parks and Wildlife Service (NPWS) is the largest land manager within our region, managing 455,434 ha. NPWS has a biosecurity duty to undertake pest animal management on its land. It participates in regional programs but also identifies important biodiversity assets that need protection on and near to its estate. NPWS undertakes monitoring of its control programs and has representation on the RPAC.
Forestry Corporation of NSW	X			X		Forestry Corporation of NSW (FCNSW) manage softwood plantations and native forestry within the region. Its estate is located primarily in the south-east of the region and has a total land size of 167,080 Ha. It has a biosecurity duty to undertake pest animal management on its land. It also undertakes project monitoring, and has representation on the RPAC.

Agency/Corporation	On-ground	Advisory	Monitoring	Planning	Compliance	Comment
Crown Lands	X	X	X	X		NSW Crown Lands (NSWCL) manage a variety of different land use types, totalling 146,608 ha. It has a biosecurity duty to undertake pest animal management on its land. It also undertakes project monitoring, and participate in regional planning through the RPAC where they have representation. Although some of its land is under lease to land managers, it still has a responsibility to ensure the management of wild dogs.
WaterNSW	X	X	X	X		WaterNSW is the State-Owned Corporation that operates the state's rivers and water supply services. It is responsible for the management of the state-owned land around Windemere, Burrendong, Wyangala, Carcoar, Oberon and Rydal dams in the CTLLS region. It has a biosecurity duty to undertake pest animal management on its land. WaterNSW has representation on the RPAC.
Biodiversity Conservation and Science, Department of Planning, Industry and Environment		X				The Biodiversity Conservation and Science (BCS) part of the Department of Planning, Industry and Environment play an advisory role in planning pest animal programs. It provides advice on particular regional biodiversity assets that may need protection through environmental biosecurity programs including threatened species habitat. It is not a land manager and hence doesn't undertake on ground work.
NSW Department of Primary Industries (NSW DPI)		X	X	X	X	Through its Vertebrate Pest Research Unit, NSW DPI plays a key advisory role in programs, including design, implementation and monitoring. It is a leader in identifying the effectiveness of control methods, and wild dog biology, and provides important data about movement pathways and the genetics of populations. It is not a

Agency/Corporation	On-ground	Advisory	Monitoring	Planning	Compliance	Comment
						land manager so does not undertake on-ground work. NSW DPI contributes to regional planning, and undertakes research and monitoring. It assist in identifying regional assets that require protection within the region.
Pest Animal Groups	X	X	X	X		Pest Animal Groups (PAGs) are local voluntary groups of land managers that are integral in planning for and undertaking pest animal management in a collaborative fashion. They undertake on-ground control collaboratively with neighbours, provide advice and training to one another, undertake monitoring and reporting of wild dog sightings and collaboratively plan integrated control programs. Local groups are a critical part of effective pest control programs with a focus on protection of individual and local assets. The current distribution of PAGs within the region can be seen in Map 3, Appendix 1.
Individual Land managers	X		X			Individual land managers manage pest animals on their properties through co-operation with neighbours, groups or on their own. They have a biosecurity duty to undertake pest animal management on their land. They identify and prioritise management tools and locations based on the protection of their own assets. Individuals are also encouraged to monitor dog activity (including stock kills) and report these via FeralScan. This information can greatly assist with tracking changes to range extent. There are 2,304,833 ha of land managed by private land managers in the Central Tablelands region.
Mining	X		X			Mines in our region have large landholdings, either as part of the active mine operation or as biodiversity offsets that are sometimes

Agency/Corporation	On-ground	Advisory	Monitoring	Planning	Compliance	Comment
						<p>disparate to the mine operation. They have a biosecurity duty to undertake pest animal management on their land. Mines undertake on-ground pest control works in their capacity as individual land managers or as part of collaborative programs. They undertake monitoring including reporting dog sightings.</p>
<p>Central Tablelands Regional Pest Animal Committee</p>		<p>X</p>		<p>X</p>		<p>The RPAC is made up of individuals representing five agencies and local agricultural industry interests including NSW Farmers. The majority of the agencies are large land managers, and are generally government agencies, utility providers and managers. The group meets a minimum of twice yearly and is facilitated by CTLLS. The role of the group is to plan collaborative pest animal management activities which are effective across the region.</p> <p>RPAC facilitates strategic planning and coordination for priority pest animal management programs across the region. RPAC is a formal community advisory group of the CTLLS Board with membership representing the major land managers across the region.</p>
<p>State Pest Animal Committee</p>				<p>X</p>		<p>The State Pest Animal Committee (SPAC) is responsible for overseeing a consistent approach to the ongoing operation of Regional Pest Animal Committees and the development of Regional Strategic Pest Animal Management Plans across the State. SPAC oversees key policy and strategy documents to guide pest animal management outcomes across NSW. SPAC membership is comprised of NSW DPI, LLS, NPWS, Local Government, NSW Farmers, Landcare, RSPCA and the Nature Conservation Council. SPAC meets at least twice a year.</p>

Challenges of effective wild dog management

The predominant challenges for managing wild dogs in the CTLLS region include:

- Mobility of wild dogs (requiring coordinated action and management)
- Targeting resources to priority areas and control methods
- Changing land use and social demographics (new land managers)
- Absentee land managers
- Public perceptions and differing community attitudes to wild dog impacts and control
- Concerns over off-target impacts of control methods
- Accessibility issues due to steep forested country.
- Limited control techniques in peri-urban areas
- Lack of participation in collaborative programs leads to fragmented programs with reduced effectiveness

Why manage wild dogs in the Central Tablelands Local Land Services Region?

Agricultural impacts

Through lost agricultural productivity via livestock predation, wild dogs have an impact of \$89 million on average, per year across Australia (PestSmart 2020). CTLLS Biosecurity staff receive frequent reports of wild dog activity around our region. Wild dogs predate on sheep, lambs, goats and calves and thus have the capacity to impact on grazing and wool enterprises within the CTLLS region. Because of these impacts Allan and West 2013 suggest that the distribution of dogs in the landscape has an influence over the location of lamb and wool enterprises. Wild dogs are also known to harbour a range of diseases including some that can be harmful to stock and domestic pets. The CTLLS region has prosperous grazing enterprises including cattle and sheep for meat and wool. These enterprises are generally spread evenly throughout the region. This is one of the reasons that regional control programs need to focus on managing wild dogs and their primary movement pathways.

Social impacts

The social impacts of wild dogs and wild dog attacks on livestock and domestic animals significant. Thompson et al 2013 provide a summary of recent work undertaken which assists in quantifying these impacts. The report identifies a range of issues including reduced farm income and financial stress, physiological distress, loss of community cohesion, loss of genetic stock and animal welfare concerns. Wild dogs found in the peri-urban areas of the CTLLS region can carry serious diseases which pose a risk to public health, with Helminth parasites being the most common. Although it's generally uncommon, aggressive behaviour of wild dogs towards humans has been observed and reported within the CTLLS region.

Environmental impacts

The impact of predation by wild dogs is listed as key threatening process under State and Commonwealth legislation including the *Biodiversity Conservation Act 2016* and *Environment Protection and Biodiversity Conservation Act 1999*. Threat abatement plans have been written for these species and identify the best mechanisms to manage them. Wild dogs have the capacity to predate on a range of species and a variety of size and weight ranges, although they prefer small to medium-sized mammals (CRC 2011). In the CTLLS region this includes small and medium-sized mammal and bird species including Brush-tailed Rock Wallaby, Koala, Greater Glider and Superb Lyre Bird, among others. Wild dogs have the capacity to prey on larger native species when

hunting in packs (DAF 2016). The CTLLS region is known habitat for 173 threatened species and contains significant core areas of native vegetation and habitat, including the Greater Blue Mountains World Heritage Area (GBMWA) and habitat contiguous to this. It is widely acknowledged that predator management post-fire is key to species recovery, because of the increased incidence of key predator species in habitat post-fire. A study undertaken in South-eastern Australia by Hardsky et al 2017 looked at the behaviour of key predators pre and post fire. The study found that due to a reduction in the density of understorey vegetation, the abundance of feral predators increased five times, and rates of predation doubled. The careful management of key predator species (including wild dogs) will be key in the recovery of our unique ecosystems, extant vegetation and biodiversity generally, however, the role dingoes play in regulating native small mammal populations should not be underestimated. Given the impact of the 2019/20 fires on significant biodiversity habitat in the eastern portions of the region it is prudent to also identify these areas in the design of wild dog control programs.

The regional response

How we prioritise management - three levels of asset management

As part of this Plan three levels of assets are identified. **Regional assets** include our whole of region farming industries, and environmental and biodiversity assets, including areas of known habitat for key prey species, and large areas of core and contiguous extant bushland. **Local assets** are identified as those important to Pest Animal Groups and managed through Local Pest Animal Management Plans (LPAMPs). **Farm/individual assets** are those identified as important by individual farmers or other land managers.

While not expressly depicted in the asset management hierarchy, this plan also acknowledges that national assets exist within our region, including agricultural and environmental. These are covered under 'regional assets' in this context.

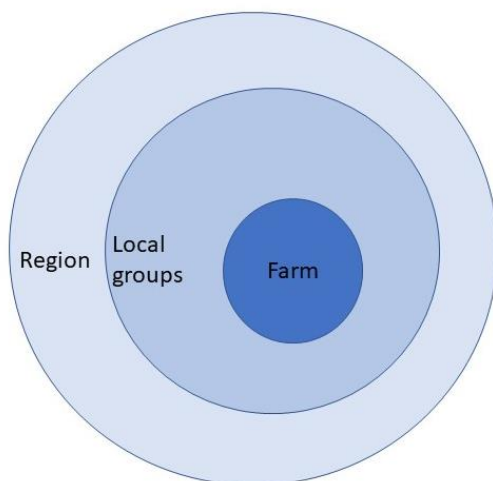


Figure 3. Asset management levels

Management goals and who is responsible for what

Wild dog management goals differ for each of the asset levels identified above, consistent with legislative responsibilities and the need to allocate resources to areas where the impact from wild dogs is the greatest. In

line with the Plan’s commitment to building effective partnerships and the model for shared responsibility, Table 2 outlines the responsibilities of CTLLS, pest animal groups and all land managers.

Table 2. Management goals and responsibilities

Asset level	Management goal	Central Tablelands LLS	Pest animal groups	Individual land managers (public and private)
Regional	Landscape suppression	<p>Coordinate large scale regional programs – taking into consideration all relevant statutory requirements.</p> <p>Provide technical expertise on control technology.</p> <p>Undertake region-wide cross jurisdictional/agency planning to ensure efficient and effective programs</p> <p>Stay up-to-date with current technology and research.</p>	<p>Support programs through promotion and communication within the community.</p> <p>Assist in planning at a local scale, in consultation with the local biosecurity officer assigned to each group.</p>	<p>Participate in aerial and ground baiting landscape scale programs.</p> <p>Uphold their biosecurity duty.</p>
Local	Eradication and prevention	<p>Provide technical expertise and control technology</p> <p>Assist in the development of Local Pest Animal Management Plan (LPAMP)</p> <p>Deliver capacity building and extension activities</p> <p>Training</p>	<p>Prepare and coordinate Local Pest Animal Management Plan (LPAMP)</p> <p>Deliver coordinated control responses</p> <p>Monitoring and reporting dog activities</p> <p>Participate in training</p> <p>Have conversations and involve the community members to have input.</p> <p>Promote pest group activities via various communication tools - such as social media and email.</p>	<p>Participate in practical and agreed control programs consistent with LPAMP.</p> <p>Monitoring and reporting dog activities</p> <p>Participation in training</p>
Individual farm/land holding	Eradication and prevention	<p>Coordinate materials for control programs</p>	<p>Assist in control and advice at an individual property scale where the need arises.</p>	<p>Undertake control of wild dogs</p> <p>Monitor and report wild dog activities</p>

		<p>Capacity building and extension activities through the Pest Piece email</p> <p>Upskilling group members – as requested – such as focused workshops on Feral Scan, camera monitoring and placement, Vertebrate Pesticide Training (VPT) courses, trapping techniques etc.</p>		Participate in training
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Approach for the management of wild dogs

Wild dogs are a complex group of animals with home ranges of between 400 and 100,000 Ha. In the CTLLS region however, the average home range of wild dog is generally 4000 Ha (DPI 2018). What this means is that wild dogs can and do travel vast distances utilising multiple properties and land types, including land used for grazing, cropping, conservation, forestry and areas around large water reservoirs. They are highly mobile and travel large distances. The implications of this are that no one farm or land manager can be solely responsible for wild dog control and because in our region where properties are smaller than 4000 Ha, wild dogs will predate and forage and rear young across multiple properties regardless of land tenure. It's for this reason that this Plan takes a tiered approach to management, where regional, local and individual landholder management and suppression occurs.

Which areas are the focus for regional control efforts?

Wild dogs have distinct families or kin groups which occupy different parts and use different movement pathways in the landscape. Being able to identify where in the landscape these kin groups are and what their key movement corridors are allows us to better target control. Preliminary work has been undertaken by Freney et al, in conjunction with staff from CTLLS to identify key kin groups and movement pathways in the CTLLS region. The identification of kin groups within the study was done by sampling and identifying DNA from wild dogs. The study found that the region has 29 kin (family) groups, with two spread over large distances. One was spread along a north-south route from Leadville (in the Central West LLS region) to Fremantle and the other orientated west/east from Nullo Mountain to Sunny Corner. The key regional movement pathways are depicted generally in Map 4, more detailed mapping showing the location of the two extreme distributions of dog kin groups can be seen in Map 5.

Additionally, mapping developed in 2016 by NSW DPI shows the relative abundance of wild dogs across the CTLLS region and this is depicted in Map 6 in Appendix 1. What this mapping shows is that the reported number or density of wild dogs is the highest along the eastern portion of the region and is generally lowest in the western portion of the region. This is consistent with the kin group mapping referred to above (Map 5) and reported dog sightings during 2019/20. Map 7 shows the relationship between the predicted distribution from 2016, and the recent recorded sightings. Together, these maps provide a strong picture of wild dog abundance and distribution within the region.

It is on this basis that the focus areas for regional aerial and ground baiting programs will be prioritised and that via the CTRPAC, CTLLS will encourage the implementation of collaborative programs with large land managers and PAGs in these areas.

Planning for action

Central Tablelands Regional Pest Animal Committee (RPAC)

The Central Tablelands Regional Pest Animal Committee (RPAC) serves a key planning and advisory function for pest animal management (including wild dogs) within the region. The committee organises regional and collaborative projects. This collaboration assists in delivering the nil-tenure approach to wild dog control which ensures effectiveness and consistent actions. The Committee meets twice-yearly to define and review activities that occur across the landscape to assist in the suppression of pest animals, including wild dogs. RPAC reports against the CT RSPAMP and will undertake a mid-term review in 2021 and a full review in 2023.

Wild Dog Management Plan 2021-2026

This Wild Dog Management Plan guides the investment of resources and the management of wild dogs in the CTLLS region with the goal of reducing the impact of wild dogs on key assets with high economic, environmental and social value. It ensures the focus of wild dog control is on areas where the risk of negative impacts are the greatest rather than across the entire area of wild dog distribution.

The Plan is also an important tool in setting the expectations of what is required of all stakeholders in wild dog control and management. This aspect of the Plan is especially important in enabling land managers to meet their biosecurity duty.

Local Pest Animal Management Plans

Pest Animal Groups (PAGs) are encouraged and supported to prepare Local Pest Animal Management Plans (LPAMPs). These LPAMPs enable land managers and other affected parties to agree on wild dog control activities that are tailored to their local area, to monitor the agreed actions and to review the overall success of the LPAMPs. PAGs contribute to the development and implementation of their LPAMP and underpin a nil-tenure approach to managing wild dogs in the CTLLS region.

Through developing, committing to and implementing a LPAMP, the following benefits can be expected by participating land managers and the broader community:

- Minimising the negative impacts of attacks on stock and wildlife
- Improved productivity
- Meeting legislative requirements (discharging the 'biosecurity duty')
- Implementing best practice - achieving legal, efficient, effective and humane wild dog control
- Fostering good working relationships with other land managers and community members.

CTLLS will work with PAGs to prepare these plans. The LPAMPs also assist CTLLS Biosecurity staff to anticipate when support might be required for pest animal programs such as the provision of baits, risk assessments, etc.

Community engagement, support and training

Community engagement is fundamental to the success of wild dog management within the region. It involves supporting and increasing/developing the skills and opportunities for the community to manage wild dogs. Wild dog control is most effective when as many land managers as possible are participating in control programs and delivering the right on-ground approach. During workshops held with the PAGs as part of consultation for this Plan, several groups highlighted the need for greater land manager participation in control programs. The groups highlighted that this was a major limitation in the effectiveness of programs. Ensuring all land managers have the knowledge, skills and awareness to participate is paramount. For this reason, engagement, support and training will continue to be a primary focus.

CTLLS encourages and supports community engagement in several ways, including;

- Technical training including trapping schools
- Vertebrate Pest training (VPT courses) – VPT courses are delivered online and by CTLLS biosecurity staff and completion of these allows land managers access to restricted chemical products (RCP) (1080 or PAPP). The training focuses on pesticides used in pest animal control, vertebrate pest species, and relevant health, safety and environment risks and mitigation measures
- Newsletters and updates – CTLLS produce a newsletter called ‘Pest Piece’. This provides tips and advice about what might be happening in the biosecurity space within the region. PAGs are encouraged to forward these newsletters onto their group members and neighbors
- Social media and event updates – CTLLS has a Facebook page and regularly provides information about topical issues to keep everyone engaged and informed
- FeralScan reporting
- Funding and grants to pest animal groups – e.g. exclusion fencing program, trapping funds, bushfire recovery funding program
- Program implementation – aerial baiting, surveillance, coordinated baiting programs
- Monitoring networks
- Pest Animal Group mentors/support
- Planning and mapping
- Participation in research and extension programs – e.g. DNA work

Methods of wild dog control

Integrated pest animal management

Over the last decade there has been a shift in the thinking about what constitutes best practice pest animal management. Traditional thinking was that aiming to kill as many individuals as possible was the most effective approach to delivering outcomes. New evidence suggests however, that pest animal control activities are most effective when they're well planned, cross tenure and are undertaken based on the identification of assets (DPI 2018). This includes programs designed to use a variety of approaches (baiting, trapping, shooting) and programs that target multiple species, where approaches for dog management will also deliver management outcomes for other complimentary species including foxes, cats and pigs. CTLLS has adopted this integrated and planned approach by supporting local management action and designing and implementing region-wide projects. Integrated vertebrate pest control programs need to be designed specifically for scale, area of influence, and based on animal behaviour. Further information about the different management actions that form part of the integrated programs is provided below. The data provided is largely attributable to Appleton et al 2011.

Baiting – aerial and ground - 1080

Baiting involves the distribution of 1080 (sodium fluoroacetate) dog baits around identified assets or in high movement areas for dogs. There are a number of bait types available including fresh meat and manufactured baits. The use of 1080 baits provides a broad approach to predators because baiting is also effective in the management of cats and foxes.

Aerial baiting has been carried out in the CTLLS region for over 20 years and is planned and coordinated with other regional aerial baiting programs conducted by adjacent LLS regions and various private and public land managers including NPWS, NSWFC, NSWCL and WaterNSW. These programs will be planned on an annual basis through the RPAC. Acknowledging that integrated pest management is the most effective approach, the aerial program is rolled out with ground baiting activities with significant input from PAGs and other land managers.

In areas that are easily accessible by vehicle or on foot, ground baiting is the most cost-effective way of distributing baits, but in inaccessible areas aerial baiting is required. Ground baiting also has advantages over aerial baiting because the placement of baits can be targeted. Ground baiting is the primary method for PAGs and individual land managers to undertake baiting.

A study undertaken by Flemming and Ballard demonstrates that broadscale baiting activities in Autumn and Spring are the most effective. The Study also demonstrates that Aerial baiting is carried out at the approved rate of 40 baits per linear kilometre, which research has proven to reduce wild dog populations by approximately 70%. In NPWS Estate, baiting density is influenced by the nature of the aircraft – baiting with fixed-wing aircraft is undertaken at a density of 10 baits/km, whereas baiting using helicopters is undertaken at a density of up to 40 baits/km.

At the writing of this plan CTLLS funded aerial baiting programs cover approximately 8,000km² which represents one quarter of the CTLLS region. This program provides large scale net benefit to individual land managers and managers collectively. CTLLS will continue to look for opportunities to extend this program.

Baiting – PAPP

PAPP or Para-aminopropiophenone is a pesticide used in manufactured baits and can largely be used interchangeably with 1080 for ground-baiting. PAPP is not approved for aerial delivery. It is faster acting than 1080 and an antidote can be effectively administered to non-target species if time allows. PAPP generally has greater impacts to non-target native species including Goannas, Quolls and Bandicoots. These species are susceptible to PAPP but not to 1080 at the doses used for dogs and foxes, this is due to the natural tolerance of these animals to 1080. It is for this reason that PAPP is generally not used in the baiting programs run by CTLLS. Some jurisdictions including NPWS exclude the use of PAPP within their reserves.

Trapping

Soft jaw leg hold traps can be used to trap wild dogs. Under the *Prevention of Cruelty to Animals Act 1979* (PCA Act), traps must be checked every 24 hours, and wild dogs found are destroyed. Trapping is often reactive or used as a targeted control method and can be used after baiting campaigns. It can be beneficial in encouraging participation because captures are easily demonstrable. Trapping is a resource intensive and expensive method where traps need to be set and then checked daily to ensure welfare standards are maintained. It can be the case that individual animals learn and become 'trap-shy', reducing the effectiveness of this approach. It is not an effective method for significant reduction of population numbers in a timely or cost-effective manner, and thus not used for regional or local programs.

It may be applicable to individual land managers who can set and target traps around their individual assets or where the use of pesticides is not feasible.

Shooting

Shooting is resource intensive and generally not suited to landscape-scale population reduction. While kills are demonstrable which may encourage participation, its application is largely opportunistic. The use of shooting as a means of wild dog control is a method suited to specific land holdings and may take the form of opportunistic or scheduled shoots utilising decoying/howling techniques. It is primarily used to protect individual landholder assets. Like trapping, specific animals can become evasive and 'gun-shy'.

M44 Canid Pest ejectors

M44 Canid pest ejectors are mechanical devices that eject poison into the mouth of an animal once the animal pulls on a lure attached to the device. The primary part of the ejector is hidden below the ground. The ejectors can

be used with 1080 or PAPP. Benefits of ejectors are that they are highly target specific, the ejectors do not need to be checked regularly and the poison is administered directly to the animal, and cannot be cached. M44 Canid pest ejectors are used by CTLLS as part of an integrated program. Land managers can use Canid Pest Ejectors after completing training.

Guardian animals

The use of guardian animals involves placing animals that are aggressive toward wild dogs with stock, and the animals act as shepherds over the stock. Animals commonly used are other dogs, llamas and donkeys. Guardian animals provide a first line of defence, and reduce the vigilance required by producers. To be successful, guardian animals need thorough training to ensure they do not attack stock or stock on adjoining properties. They do not reduce the abundance or number of wild dogs in a landscape, and therefore should be used in conjunction with other control methods. The use of guardian animals if undertaken correctly has application at a farm-scale response to wild dogs.

Exclusion fencing

Exclusion fencing involves the erection of a fence which excludes target pest animals from an identified area. Exclusion fencing can be used at a range of scales from state-wide boundaries such as the western division wild dog fence to targeted paddocks or areas of native biodiversity. Exclusion fencing gives the producer or land manager a strong sense of control and protection, and they can be highly targeted to the asset they are trying to protect. Exclusion fencing can also be used to provide a clear delineation for other management actions i.e. once established you only need to bait or shoot on one side of the fence. Exclusion fences are expensive to establish, require maintenance and in some instances may not be appropriate because they inhibit the movement of other animals.

A table outlining the scale at which these methods are most appropriate is provided in Appendix 3.

Monitoring and evaluation of our programs

Monitoring is key to ensuring the effectiveness of wild dog management in the region. Table 3 outlines the types of monitoring undertaken to ensure effective evaluation of wild dog management in the region.

Table 3. Monitoring approaches

Type	Comment	Responsibility
Recording of wild dog activity via FeralScan or direct reporting to CTLLS staff.	Dog activity data should be uploaded to FeralScan in accordance with the CTLLS procedure for the use of FeralScan.	CTLLS staff, land managers, public land managers and PAGs
Monitoring effectiveness and activity of targeted programs.	This may include the use of remote cameras, thermal imagery, or spotlighting to capture baseline data. Due to resource constraints it is not anticipated that this would happen as part of every program, but could be undertaken if resources allow. Consideration should be given to undertaking	CTLLS, NPWS and DPI.

	monitoring in accordance with the DPI Reset program.	
Collection and reporting against the metrics in CTLLS Regional Strategic Pest Animal Management Plan.	<p>CTLLS is required to report on progress made toward achieving the state-wide goals, annually. Progress is demonstrated by collection of data against identified state-wide metrics. The RSPAMP will be reviewed in 2021 and again in 2023. This information will be provided to RPAC the community. For wild dogs, this includes;</p> <ul style="list-style-type: none"> • Reports of stock losses • Number of land managers in local wild dog plan areas participating in baiting programs • Management groups formed when wild dogs are identified in an area 	RPAC

Pesticide Risk management – health, safety and the environment

The management of wild dogs in NSW is highly regulated to ensure that the risks associated with the on-ground activities including impacts to off-target species and animal welfare are managed. The use of pesticides in NSW (including 1080 and PAPP) is regulated under the NSW *Pesticides Act 1999*. Under Section 38 of the Act, the Environment Protection Authority (EPA) issues Pesticide Control Orders (PCOs) which outline how a certain pesticide (or group of pesticides) can be used in NSW. Adherence to the orders is mandatory and enforceable by law. The requirements assist in ensuring the health and safety of people and make sure that the impacts to the environment are minimised. Table 4 below provides a list of the requirements outlined in the PCOs for PAPP and 1080, and how these assist in mitigating risks. The Vertebrate Pesticides Manual published by DPI also assists in outlining and interpreting the details in the PCOs. Copies of the most recent PCOs can be found at the [NSW Environment Protection Authority website](#).

Table 4. Requirements for pesticide use to manage impacts on health, safety and the environment

Risk	Mitigation measure	1080	PAPP
Impacts to non-target companion animals and other livestock	An antidote exists which can be used in accidental poisoning		X
	There are minimum distances that dictate the placement of baits relative to boundary fences, habitable dwellings and water sources	X	X
	Risk assessments are undertaken by all land managers being issued pesticides by LLS.	X	X
	Land managers and LLS staff are required to adhere to strict notification procedures, including signage	X	X
Impacts to non-target native animals	Baits are designed or placed to ensure that they are of a size or are in a location that can't be accessed by non-target species. This may also include fencing bait sites to make them inaccessible to non-target species	X	X
	Dosages are not sufficient to kill most native animals	X	
	Risk assessments are undertaken by all land managers being issued pesticides by LLS.	X	X
Pesticides are misused because of a lack of understanding of regulations and requirements	Pesticides are laid by authorised control officers who undertake strict training and understand the requirements	X	X
	Program risk assessments are completed by LLS staff and contractors for baiting programs	X	X
Pesticides are misused used by community because of a lack of understanding of regulations and requirements	Pesticides are only issued to community members that have undertaken a Vertebrate Pest Training course.	X	X
Impacts to people, non-target species due to inadequate storage and transportation	Baits must be stored in a way that they cannot be accessed by unauthorised people. They must be able to be secured within a vehicle prior to transportation.	X	X
	Unused pesticide must be returned to the Authorised Control Officer (LLS) within 2 months of the date of issue.		
Crop contamination due to proximity to baits	Consideration must be given as to the timing and lifecycle of the crop prior to laying pesticides to ensure crop contamination does not occur.	X	X

More information

For more information, please contact the Central Tableland's Biosecurity Team on 1300 795 299.

Acknowledgments

CTLLS would like to acknowledge the input and involvement of Pest Animal Groups and other key stakeholders in providing valuable input into the drafting of this plan.

CTLLS would also like to acknowledge the assistance and guidance of Dr Peter Fleming from the Vertebrate Pest Research Unit at the NSW Department of Primary Industries.

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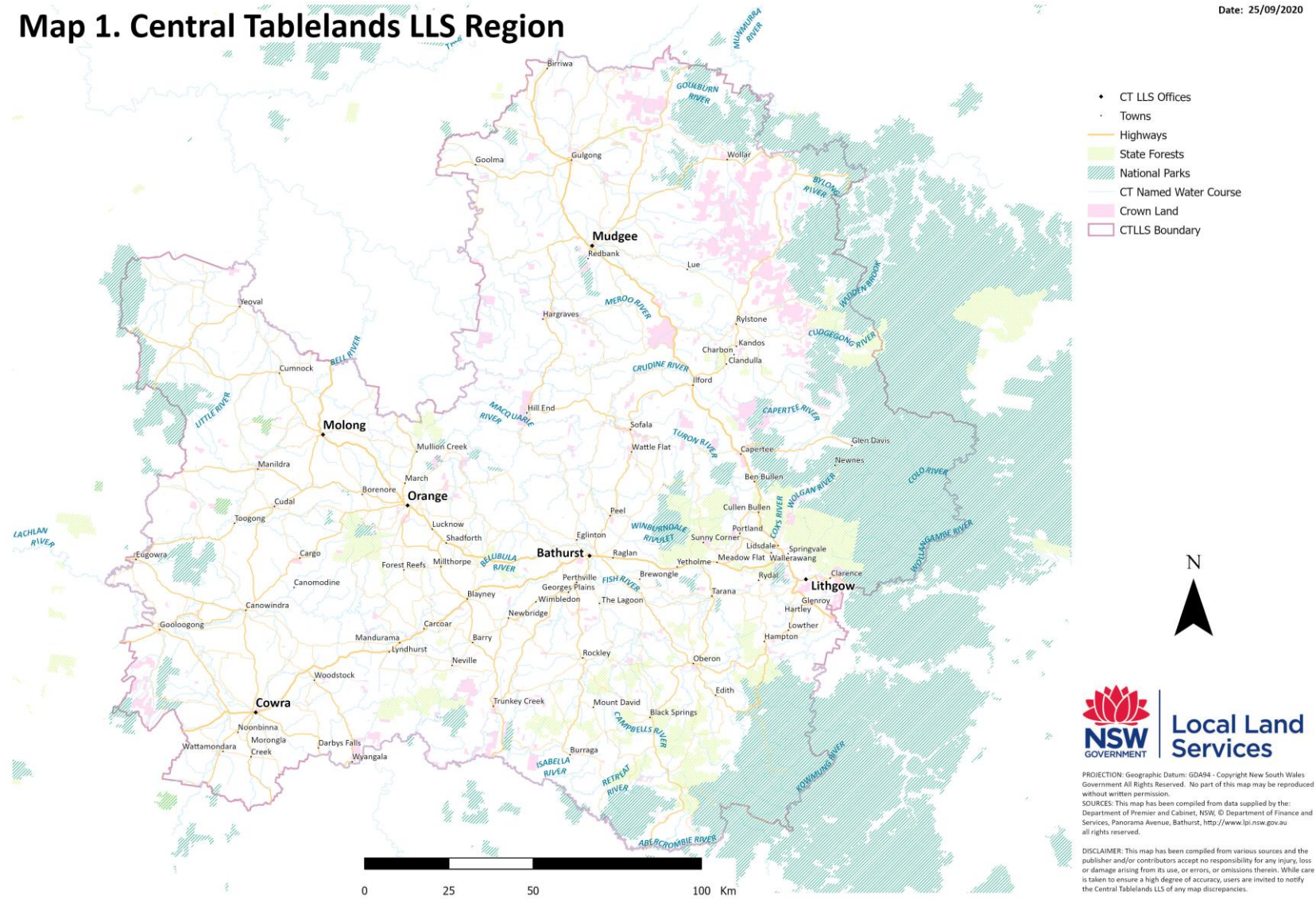
Appendix 1 – Maps

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Map 1. CTLLS region

Map 1. Central Tablelands LLS Region

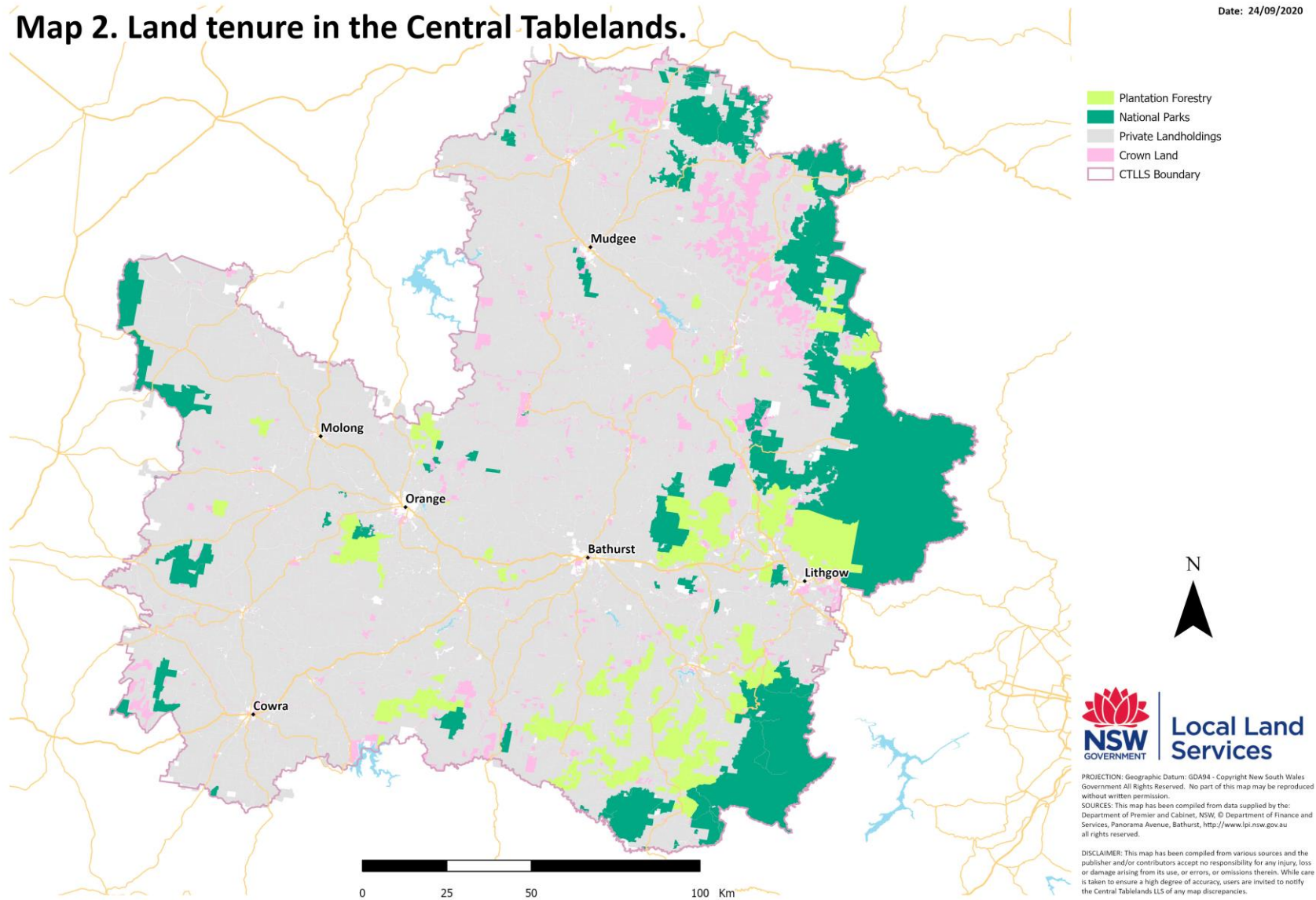
Date: 25/09/2020



Map 2. CTTLS region land tenure

Map 2. Land tenure in the Central Tablelands.

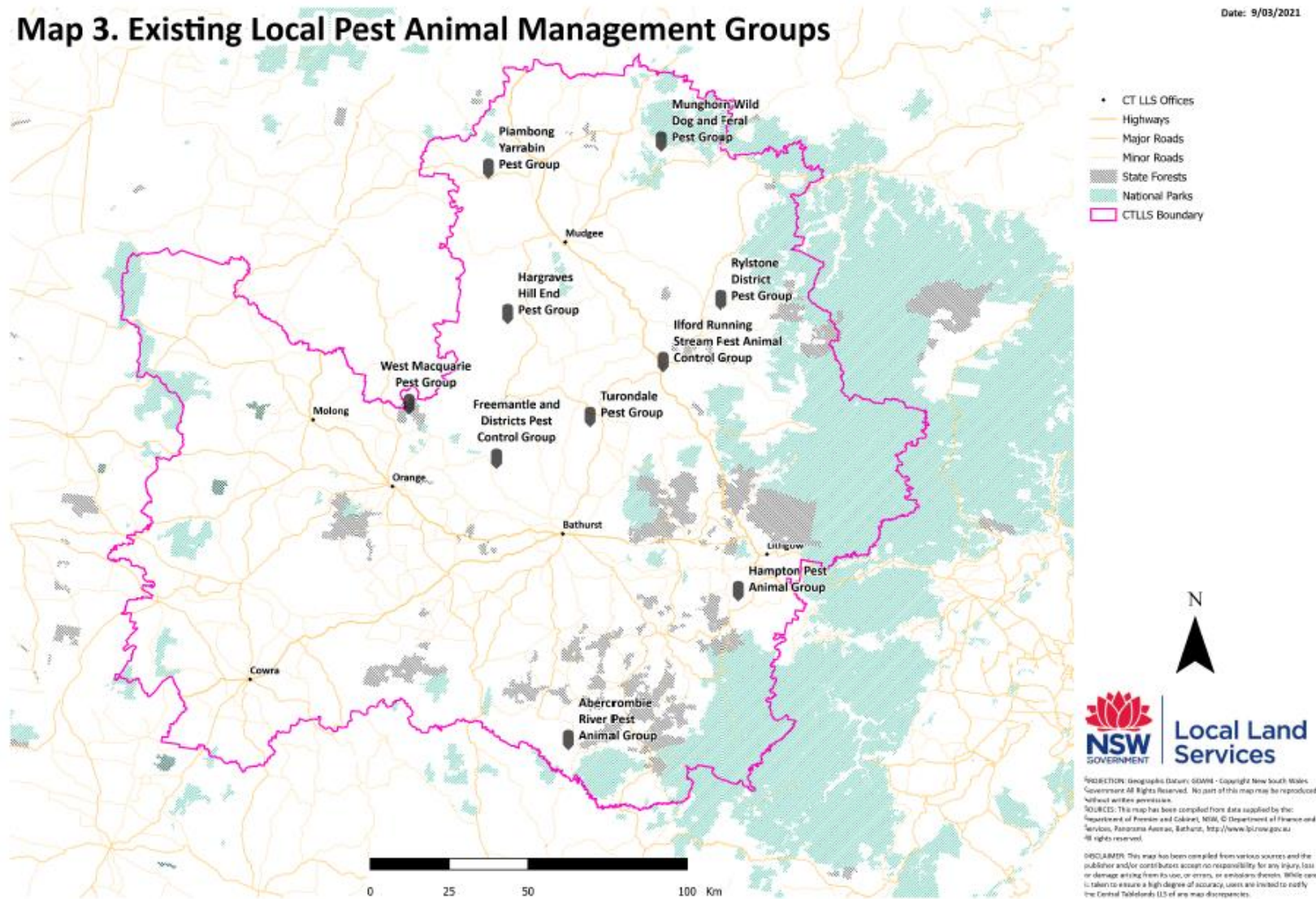
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Map 3. Existing Pest Animal Groups

Map 3. Existing Local Pest Animal Management Groups

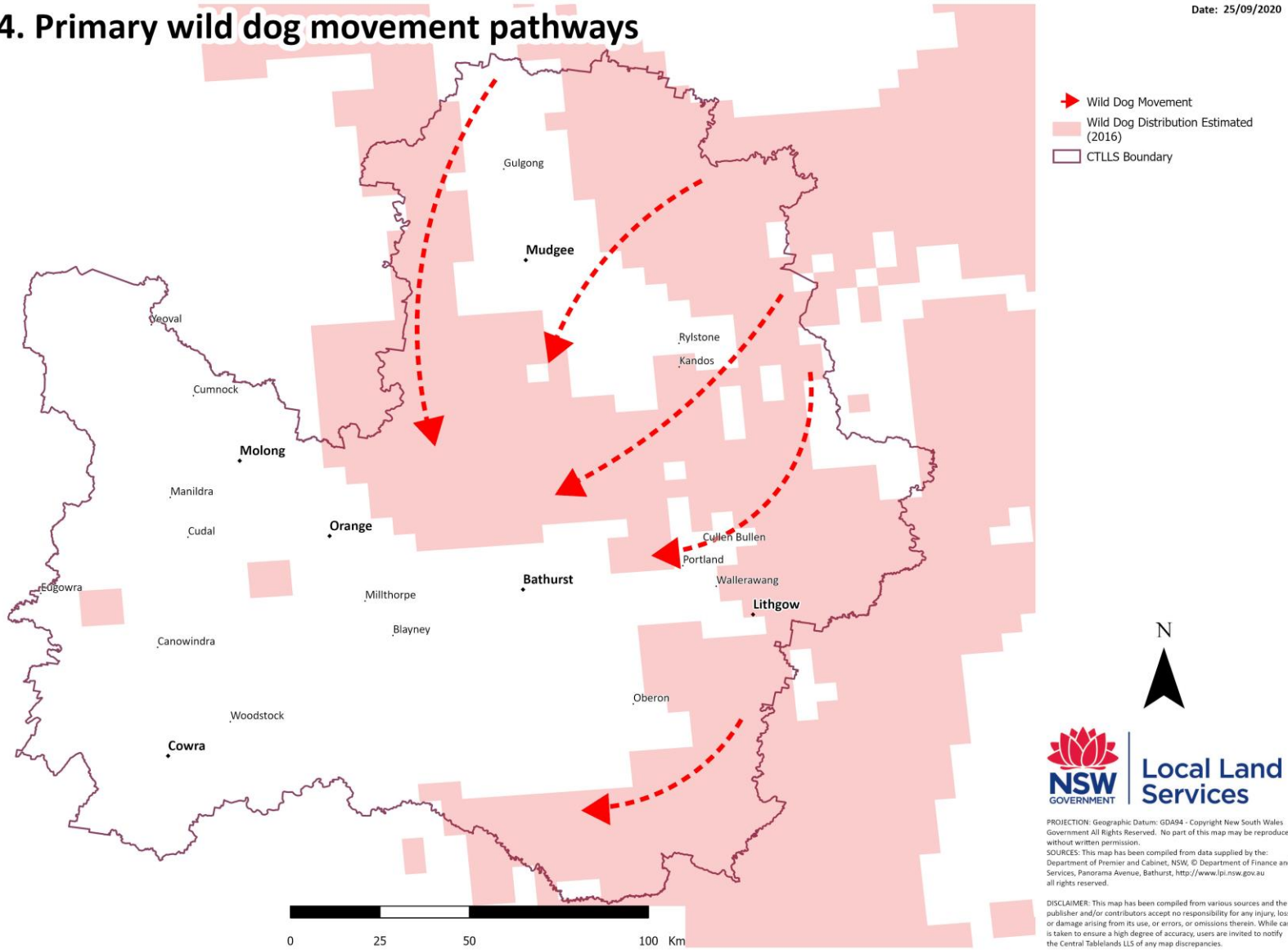
Date: 9/03/2021



Map 4. Primary wild dog movement pathways

Map 4. Primary wild dog movement pathways

Date: 25/09/2020



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Map 5. Detailed mapping - kin groups

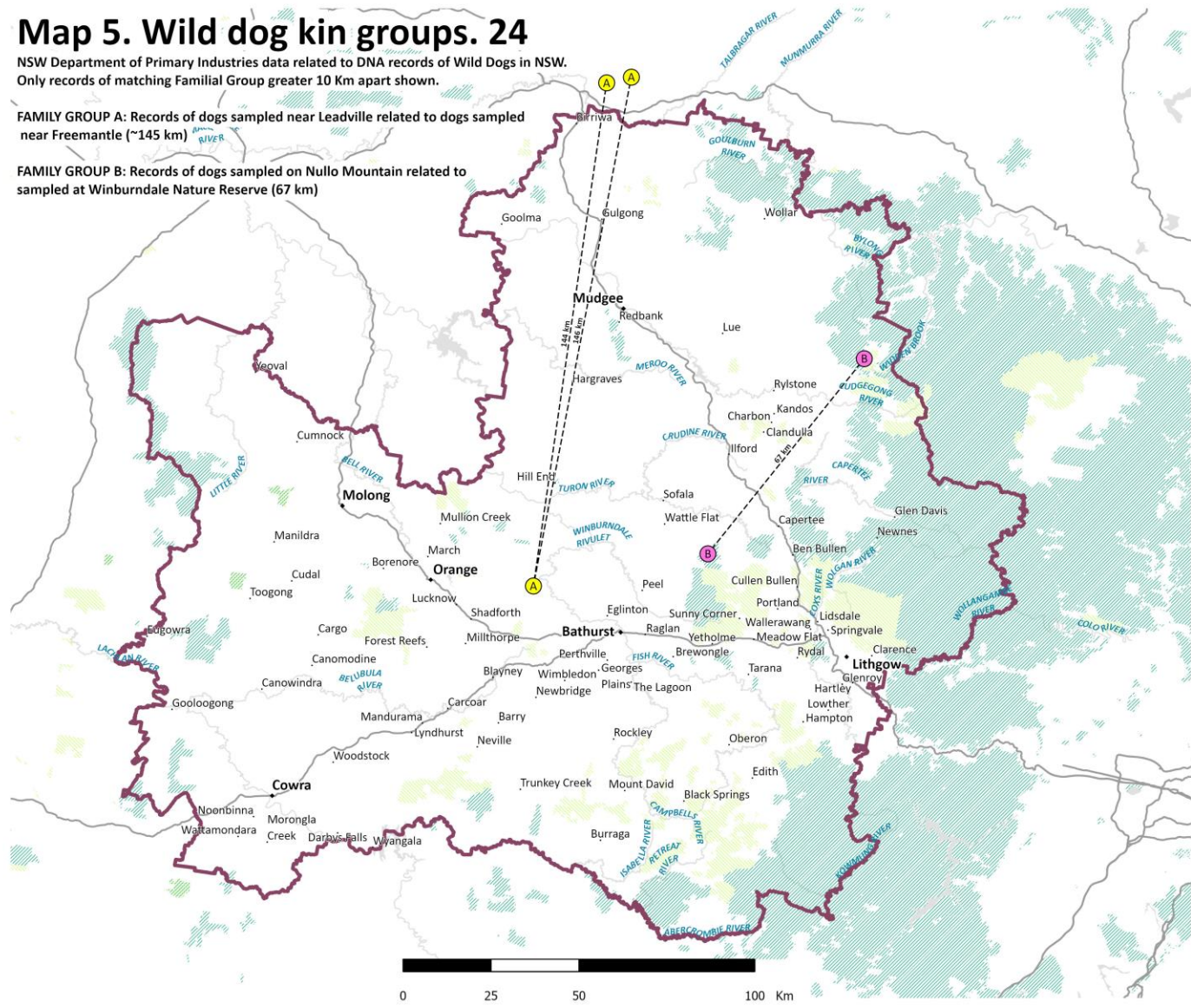
Map 5. Wild dog kin groups. 24

NSW Department of Primary Industries data related to DNA records of Wild Dogs in NSW. Only records of matching Familial Group greater 10 Km apart shown.

FAMILY GROUP A: Records of dogs sampled near Leadville related to dogs sampled near Freemantle (~145 km)

FAMILY GROUP B: Records of dogs sampled on Nullo Mountain related to sampled at Winburndale Nature Reserve (67 km)

Date: 24/09/2020

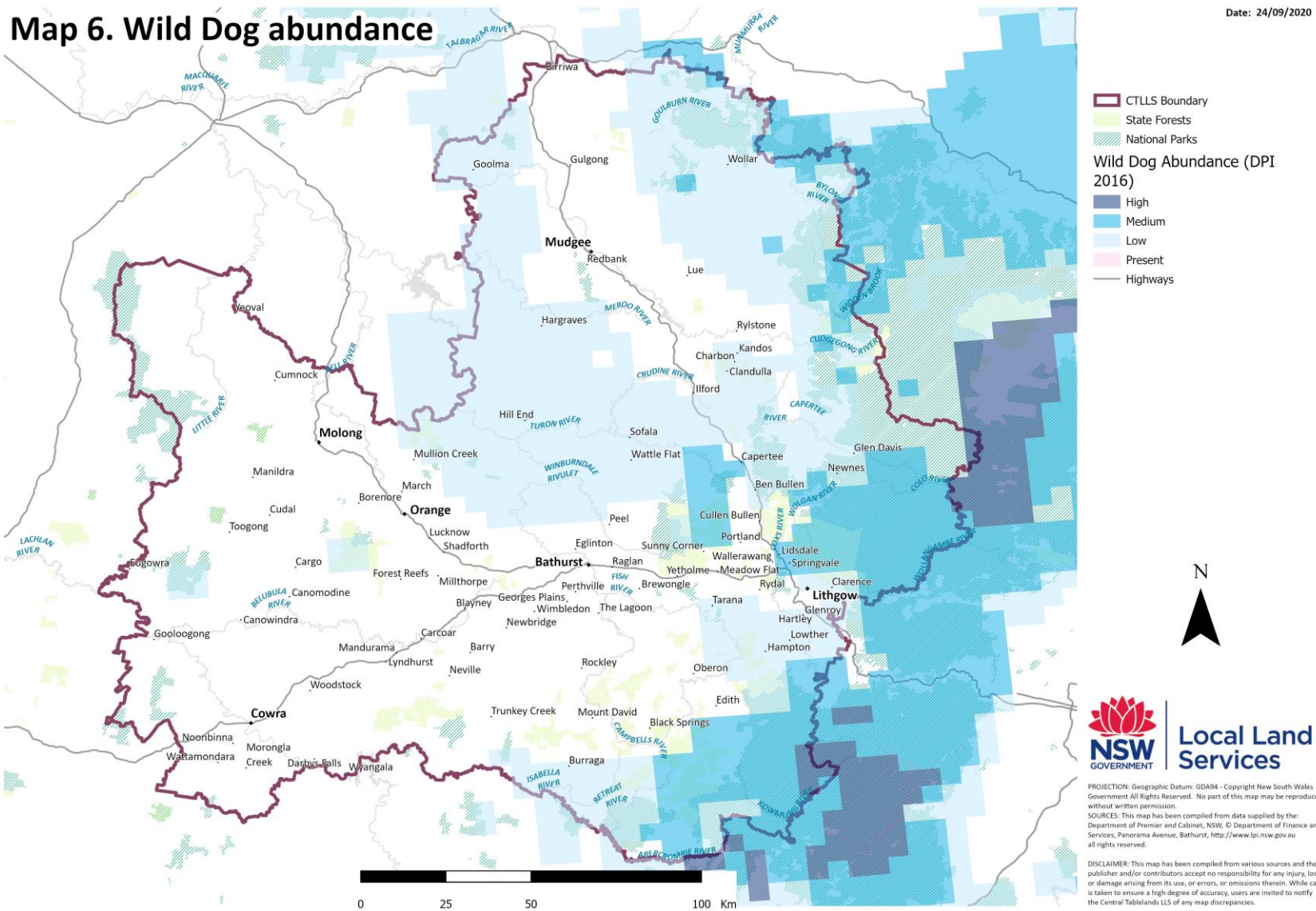


- CTLLS Boundary
- State Forests
- National Parks
- CT Main Waterbodies
- Highways
- Family Group**
- Family Group A
- Family Group B
- <all other values>
- Wild Dog Familial Links



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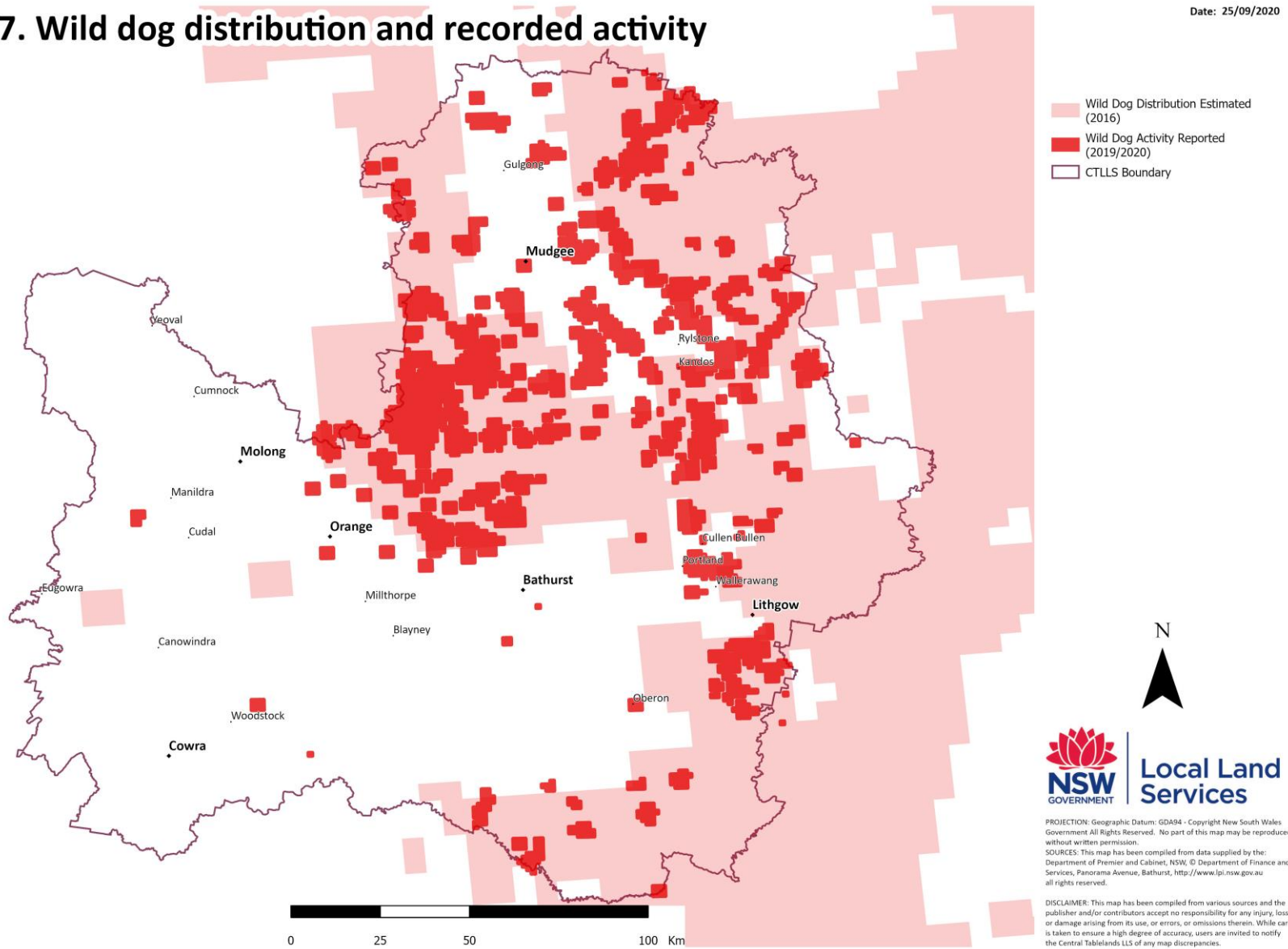
Map 6. Wild dog abundance



Map 7. Predicted distribution against recorded activity

Map 7. Wild dog distribution and recorded activity

Date: 25/09/2020



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Appendix 2 – Action Plan

Effective control requires an integrated, collaborative approach where all stakeholders participate in planning and implementation. CT LLS funding is variable. and changes in response to biosecurity emergencies and natural disasters.

Table 5. Management actions and responsibilities

Action	Intent	Management tier – Regional, Local or Farm	Success Measure	Responsibility	
				Lead	Partners
Objective - Promote the availability of technical advice and resources to land managers in CTLLS region					
Continue to actively promote the availability of technical advice, support and resources to land managers. Continue to engage with and contribute to research in best practice management.	CTLLS helping land managers to control wild dogs by providing best practice advice and assistance.	All tiers	Up to date information on wild dog control is disseminated through the CT region by all available media / communication methods.	CTLLS	RPAC, LGAs, NSW Farmers, Public land managers, DPI
Continue to actively support land managers through provision of VPT courses and other training (e.g. 1080 use, baiting techniques, trapping, CPE, camera monitoring)	Land managers in the region utilise best practice control techniques and manage the risks associated with on-ground control	All tiers	CTLLS delivers VPT and other training courses (1080 use, baiting techniques, trapping, CPE, camera monitoring to land managers)	CTLLS	Land managers and Pest Animal Groups
Objective: Engage, support, and encourage community led coordinated and integrated wild dog control activities on a nil-tenure basis					
Promote private and public land manager participation as a critical factor for wild dog management	CTLLS has an ongoing focus on extension activities to promote private and public land manager participation in wild dog control work.	All tiers	The number of land managers undertaking baiting increases	CTLLS	RPAC
	Coordinated, best practice control programs carried out on private and public land	All tiers	Reduction in reported wild dog activity / predation	CTLLS	PAGs, Public land managers, and individual farmers

Action	Intent	Management tier – Regional, Local or Farm	Success Measure	Responsibility	
				Lead	Partners
	delivers positive agricultural and environmental outcomes				
Facilitate the development of Local Pest Animal Management Plans (LPAMPs)	Increase the number of land managers engaged in coordinated, best practice wild dog control within the CT LLS region	Local, Farm	Established PAGs have a LPAMPs in place and this is reviewed every 12 months with LLS staff	CTLLS	PAGs
	Increase in the reach of PAGs including the number of land managers engaged in these groups	Local	Increase in the number of individual land managers participating PAGs and local control programs	PAGs	CTLLS
Objective - Reduce negative impacts caused by wild dogs					
Annual aerial and ground baiting programs	Supress wild dog populations across the CTLLS region to reduce stock losses and impacts on environmental assets	All tiers	Number of land managers participating in programs as reflected in CTLLS database Increase in the length of bait lines with successive programs	CTLLS	NPWS, Forestry Corp, Water NSW, Crown Lands, PAG's
Seek out external funding opportunities to allow expansion of control (additional aerial baiting programs) and engagement activities	Annual control measures carried out in regionally strategic areas including major infrastructure corridors	All tiers	New funding streams identified, negotiated and directed into additional programs, including control and engagement	CTLLS	
Staff use compliance process where appropriate	There's increases in the number of land managers controlling wild dogs as per their individual obligations	All tiers	Compliance enforcement is undertaken on an as needs basis where required	CTLLS	
Objective – Undertake planning and monitoring based on best-available information and understanding of wild dogs.					

Action	Intent	Management tier – Regional, Local or Farm	Success Measure	Responsibility	
				Lead	Partners
Promote reporting of dog sightings via FeralScan through education, and by promotion of the CTLLS FeralScan procedure	Increased understanding of wild dog activity in the region and capacity to use this to inform management	All tiers	Number of wild dog activity/sightings submitted to FeralScan or reported to CTLLS	CTLLS	DPI
FeralScan is utilised by CTLLS Biosecurity staff and the community, including responding and recording of sightings and attacks in line with the FeralScan procedure	Increased understanding of wild dog activity in the region and capacity to use this to inform management responses – both proactive and reactive	Region	Number of wild dog activity/sightings submitted to FeralScan or reported to CTLLS	CTLLS	
Individual land managers and PAGs regularly monitor wild dog activity and report via FeralScan	Increased understanding of wild dog activity in the region and capacity to use this to inform management	Local, Farm	Number of wild dog activity/sightings reported to CTLLS	PAGs and land managers	
Convene Regional Pest Animal Committee and undertake integrated, cross-jurisdictional planning, implementation and monitoring programs	Ensure delivery of nil-tenure wild dog management and monitoring.	Regional	Two meetings of the RPAC are convened each year and an annual work and monitoring undertaken.	CTLLS	Public land managers RPAMC members.
Individual land managers, PAGs and CTLLS use FeralScan to record control activities	To better capture effort and use this data to enable local and regional programs to be more effective.	Local, Regional, Farm	Increase in the incidence of capturing control activities in FeralScan	CTLLS, Land managers, PAGs	DPI
Annual reporting of region-wide pest animal management actions and monitoring through RPAC and	Ensure transparency of on-ground control efforts and performance of region-wide	Local, Regional, Farm	Annual monitoring and reporting of outcomes of pest animal management	CTLLS	RPAC

Action	Intent	Management tier – Regional, Local or Farm	Success Measure	Responsibility	
				Lead	Partners
dissemination of this to PAGs and broader community	wild dog management programs.		programs through RPAC and to the community		
Continue to undertake and contribute to region-wide monitoring programs, through camera monitoring, thermal surveys or DNA collection	Facilitate better understanding of wild dog populations and effective management	Local, Regional, Farm	As the requirement arises, regional data on wild dog management becomes available	DPI	LLS, RPAC members

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Appendix 3 – Methods of control matrix

Table 6. Methods of control matrix

	Farm scale	Local and group scale	Regional scale
Aerial Baiting - 1080			X
Ground Baiting - 1080	X	X	X
Aerial baiting - PAPP			
Ground baiting PAPP	X	X	
Trapping	X	X	X
Shooting	X	X	X
M44 Canid Pest Ejectors	X	X	
Guardian animals	X		
Exclusion fencing	X	X	

