NSW GOVERNMENT
Office of Environment & Heritage
NSW National Parks & Wildlife Service

Regional Pest Management Strategy 2012–17: Northern Tablelands Region

A new approach for reducing impacts on native species and park neighbours

The New South Wales National Parks and Wildlife Service (NPWS) is part of OEH. Throughout this strategy, references to NPWS should be taken to mean NPWS carrying out functions on behalf of the Director General of the Department of Premier and Cabinet, and the Minister for the Environment.

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Cover photos, main: Mexican water lily at Gara River Dam (K Pines/OEH); St John's wort (K Pines/OEH); helicopter preparing for feral animal aerial shoot in Kwiambal National Park (G Dean); dingo (D Matthews/OEH); feral goats in a trap yard in Gwydir River National Park (K Pines/OEH).

Summary

Northern Tablelands Region has significant diversity in biogeographic landscapes ranging from warm temperate rainforests on the eastern escarpment, open woodlands and high altitude wetlands to spinifex communities on the western slopes. This diversity is reflected in the wide range of pest animal and weed issues currently identified across the 91 reserves managed by the Region.

The Region gives highest priority to the control of pest species that have the potential to impact on either threatened native species or on adjoining agricultural enterprises. Priority is also given to pest programs that target new or emerging highly invasive pest species.

Wild dogs, due primarily to their predation of livestock, are a critical priority pest animal for the Region. The Region works closely with the local Livestock Health and Pest Authorities and 19 wild dog control associations, utilising an integrated suite of control measures including aerial and ground baiting, trapping, shooting and barrier fencing. To ensure that trapping remains an effective control option for wild dogs, the Region regularly runs courses to train NPWS staff, landholders and others as trappers.

In the western part of the Region, priority is given to control feral pigs and feral goats due to their impact on the conservation values of the reserves and on neighbouring agricultural enterprises. Deer are an emerging pest species that are rapidly increasing in distribution and density, particularly in the northern and western parts of the Region.

Foxes, a major environmental and agricultural pest, are managed on a landscape basis. Predation by foxes has been identified as a critical threat to fauna at Little Llangothlin Nature reserve, a Ramsar site that is habitat for over 100 bird species, including a number of rare and threatened species. Control programs are undertaken twice a year in conjunction with adjoining landholders to protect both native fauna and livestock.

Apart from baiting on park, the Region has provided ongoing support to the Southern New England Landcare Coordinated Fox Control Program. The program has been running for 17 years and is supported by 30 community groups, covering over 300 properties.

Lantana has been identified as a significant threat to the World Heritage Gondwana Rainforests of Australia reserves and control is a high priority for the region. Other weeds given a high priority include blackberry, perennial cat's claw creeper, tree of heaven, honey locust and St John's wort.

The highest priority is given to preventing new weed species from becoming established in reserves. Tropical soda apple was identified in the Macleay catchment, including two NTR reserves, in 2010. With the aim of eradication, an ongoing program has been developed in close cooperation with the local Weeds Authorities to locate, map and destroy the plant.

Wherever possible, a landscape approach is taken to the control of pest species. Integrated pest programs are professionally carried out in close cooperation with key stakeholders and neighbours.

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Abbreviations

BPWW	Biodiversity Priorities for Widespread Weeds (BPWW CC1-6 refers to control categories within BPWW Statewide Framework[1])
CAP	Catchment Action Plan
CCA	Community Conservation Area
CMA	catchment management authority
EEC	endangered ecological community
GVTE	Goat Vulnerable Threatened Entities
KPI	key performance indicator
KTP	key threatening process
LGA	local government area
LHPA	Livestock Health and Pest Authority
MER	Natural Resource Management Monitoring, Evaluation and Reporting
NP	national park
NPW Act	*National Parks and Wildlife Act 1974*
NPWS	NSW National Parks and Wildlife Service
NR	nature reserve
NRM	Natural Resource Management
NTR	Northern Tablelands Region
OEH	Office of Environment and Heritage
PAS	Priorities Action Statement
PMP	park management program
POM	plan of management
PWG	Parks and Wildlife Group
PWIS	Pest and Weed Information System
RLP Act	*Rural Lands Protection Act 1998*
ROP	regional operations plan
ROTAP	Rare or Threatened Australian Plants
RPMS	regional pest management strategy
SCA	state conservation area
SOP	standard operating procedure
TAP	threat abatement plan
TSC Act	*Threatened Species Conservation Act 1995*
WDCA	wild dog control association

[1] http://www.dpi.nsw.gov.au/agriculture/pests-weeds/weeds/publications/cmas/cma_statewide-framework-web.pdf

1 Introduction

Pest management within the Office of Environment and Heritage (OEH) is guided by two core planning instruments:

NSW 2021 – A Plan to Make NSW Number One sets out performance targets, including a specific priority action within *Goal 22 Protect Our Natural Environment* which is to *address core pest control in National Parks through the delivery of NPWS Regional Pest Management Strategies and improve educational programs and visitor access*.

NSW Invasive Species Plan provides specific goals, objectives and actions in relation to invasive species management.

This document is the Northern Tablelands Region Pest Management Strategy and contains regionally specific components including prioritised pest programs.

The state strategy, Managing Pests in NSW National Parks, provides the broader planning framework for the management of pests by NPWS. It documents the policy and organisational context and describes the logic used for identifying, prioritising and monitoring pest management programs. It also establishes state-wide pest management goals, objectives and actions.

This regional strategy describes the local circumstances within the Region and applies the corporate framework from the state strategy to prioritise specific pest management programs. These priorities will be included in regional operations plans and implemented through the NPWS Asset Maintenance System. It also broadly identifies pest distribution and associated impacts across the Region.

2 Regional overview

Location

The NTR covers an area of just under 53,000 square kilometres of northern NSW. The Region stretches from the NSW–Queensland border in the north, to below Walcha and Tamworth in the south and from around Warialda/Gunnedah in the west to half way down the escarpment in the east.

The Region covers sections of 12 local government areas (LGAs) – Inverell, Tenterfield, Glen Innes Severn, Clarence Valley, Gwydir, Guyra, Armidale Dumaresq, Uralla, Tamworth, Walcha, Port Macquarie Hastings, and Liverpool Plains – and five state electorates – Northern Tablelands, Tamworth, Oxley, Clarence and Lismore.

Regional context

The NTR reserve system is comprised of 40 national parks, 33 nature reserves, 20 state conservation areas and one Aboriginal area. The 94 reserves protect an area of 592,570 hectares.

The reserves on the eastern gorge country are well known for their conservation values and wild and scenic features. The reserves on the tableland and north-west slope areas conserve unique areas of the landscape and high conservation remnants of the original New England Tableland and Nandewar bioregions.

The Region contains significant biogeographic landscapes ranging from subtropical, warm temperate and dry rainforest, open woodlands, and isolated granite outcrops supporting unique vegetation to wetland communities. Much of the NTR's landscape has been modified by farming and urban development, but significant areas have been conserved in the reserves managed by NPWS.

Park management

The Region is resourced to deliver work programs with a regional office and an operational support and coordination unit in Armidale and threee Area offices with workshop/depots in Tenterfield, Glen Innes, and Walcha, and depots in Armidale, Bingara and Yetman.

Community engagement

NTR continues to develop important partnerships with reserve neighbours, communities in adjoining towns and villages, local government, the Rural Fire Service, Livestock Health and Pest Authorities, wild dog control associations, Forests NSW, catchment management authorities, conservation groups, neighbours and other special interest groups.

In mid 2012, the NSW Government announced a new initiative to involve volunteer shooters in pest animal management on National Parks and Reserves. This initiative has been developed by NPWS into the Supplementary Pest Control (SPC) program, which is being trialled in 12 reserves across NSW. All volunteers involved in the program will be supervised by NPWS staff and will be trained to the equivalent levels as NPWS staff. All shooting will be conducted according to an approved NPWS shooting operations plan, which includes a Job Safety Analysis (JSA) and a Job Safety Brief (JSB). As part of this process, the program will only take place in sections of reserves that have been closed to the general public. The trial program will help to refine how this additional pest control option can further engage this sector of the community while complementing the programs detailed in the Regional Pest Management Strategies.

Pest management highlights

Wild dogs, due primarily to their predation of livestock, are a critical priority pest animal in the Region. The Region works very closely with the local Livestock Health and Pest Authorities and 19 wild dog control associations, using an integrated suite of control measures including aerial and ground baiting, trapping, shooting and barrier fencing. To ensure that trapping remains an effective control option for wild dogs, the Region regularly runs courses to train NPWS staff, landholders and others as trappers.

In the western part of the Region, priority is given to control feral pigs and feral goats due to their impact on the conservation values of the reserves and on neighbouring agricultural enterprises. Deer are an emerging pest species that are rapidly increasing in distribution and density, particularly in the northern and western parts of the Region.

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Lantana has been identified as a significant threat to the World Heritage Gondwana Rainforests of Australia reserves and control is a high priority for the Region. Other weeds given a high priority include blackberry, perennial cat's claw creeper, tree of heaven, honey locust and St John's wort.

The highest priority is given to preventing new weed species from becoming established in reserves. Tropical soda apple was identified in the Macleay catchment, including two reserves, in 2010. With the aim of eradication, an ongoing program has been developed in close cooperation with local weeds authorities to locate, map and destroy the plant.

Wherever possible, a landscape approach is taken to the control of pest species. Integrated pest programs are professionally carried out in close cooperation with key stakeholders.


Queensland
Goondiwindi
Boggabilla
Texas
Tenterfield
Jennings
Tenterfield
Tweed-Kyogle
Northern Rivers
Bonalbo
Mallanganee
Woodenbong
Urbenville
Narrabri
Northern Plains
Moree
Pallamallawa
Warialda
Ashford
Emmaville
Deepwater
Clarence North
Delungra
Glen Innes
Inverell
Glen Innes
Bingara
Bellata
Tingha
Clarence South
Northern Tablelands
Bundarra
Llangothlin
Guyra
South Guyra
Narrabri
Barraba
Dorrigo Plateau
Dorrigo
Bellingen
Armidale
Baradine
Hillgrove
North Coast
Coffs Coast
Uralla
Boggabri
Manilla
Bowraville
Macksville
Warrell Creek
Walcha
Gunnedah
Kootingal
Moonbi
Walcha
Curlewis
Tamworth
Smithtown
Macleay
Kempsey
Breeza
Crescent Head
Coonabarabran
Werris Creek
Spring Ridge
Quirindi
Nundle
Telegraph Point
Wauchope
Wallabadah
Manning-Hastings
Blackville
Willow Tree
Comboyne
Kendall
Upper Hunter
Lower North Coast
Murrurundi
Barrington Tops
Laurieton
Lansdowne
Mudgee
Central Coast Hunter
Northern Tablelands Region
PWG Regions
PWG Areas
Motorway
Highway
Major Road
NPWS Estate
State Forest
Built Up Area
0 20 40 km
Office of Environment & Heritage
NSW National Parks & Wildlife Service
Map projection: Geocentric Datum of Australia (GDA) 1994
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3 Regional prioritisation

The following key factors are considered when determining priorities for pest management within the Region. However, a precautionary approach using risk management will be applied where there is uncertainty about the impacts of the pest on the asset. The feasibility of effective control will also be a consideration.

Critical priority

C-TSC (Threatened Species Conservation)

Programs targeting pests which are, or are likely to be, significantly impacting on threatened species, populations or communities. These include the highest priorities identified in the threat abatement plans (TAPs), Priorities Action Statements (PAS) and Biodiversity Priorities for Widespread Weeds (BPWW).

C-HD (Health and Disease)

Programs that target pests which impact significantly on human health or are part of a declared national emergency, for example outbreak of foot and mouth disease or control of feral pigs in the catchment area of a domestic water supply reservoir.

C-EC (Economic)

Programs targeting pests that impact significantly on economic enterprises, for example wild dog control where there is potential for significant stock losses as identified in wild dog management plans.

C-NE (New and Emerging)

Programs addressing new occurrences or suppressed populations of highly invasive pest species with potential for significant impacts on park values (subject to risk/feasibility assessment), and programs to control Class 1 and 2 noxious weeds.

High priority

H-IH (International Heritage)

Programs that target pests that impact significantly on world heritage or international heritage values, for example control of lantana impacting on Gondwana Rainforests of Australia World Heritage Area.

H-CH (Cultural Heritage)

Programs targeting pests that impact significantly on important cultural heritage values, for example control of feral goats where they inhabit an area containing Aboriginal rock art, control of rabbits undermining a historic building.

Medium priority

M-WNH (Wilderness and National Heritage)

Programs that target pests that impact significantly on wilderness, wild rivers, national heritage values or other important listed values, for example control of willows along a declared wild river or within a wilderness area.

M-RA (Recreation and Aesthetic values)

Programs that target pests that impact significantly on recreation, landscape or aesthetic values, for example control of blackberry on the margins of camping areas, control of weeds in an area of natural beauty that is visited frequently.

M-CP (Cooperative Programs)

Cooperative programs (not covered in higher priorities above) targeting pests that impact significantly on park values or agricultural production (including the control of Class 3 noxious weeds or implementation of other endorsed state or regional plan), for example control of Coolatai grass across boundaries as part of a regional control plan prepared by a regional weeds advisory committee and supported by NPWS.

M-II (Isolated Infestations)

Programs addressing isolated infestations of highly invasive pest species, widely distributed in other parts of the Region, with high potential for future impacts on park values.

Lower priority

L-LP (Localised Programs)

Programs targeting pests that have localised impacts on natural ecosystems or agricultural lands that promote community skills, awareness and involvement with parks, for example participation in a new bush regeneration project with a local community group for control of Class 4 noxious weeds.

L-PP (Previous Programs)

Previous programs targeting pests that have localised impacts on native species and ecosystems, and that can be efficiently implemented to maintain program benefits, for example the maintenance of areas treated previously for serrated tussock to continue keeping them weed free.

In some circumstances, new programs may be introduced, or priority programs extended to target pests where a control window of opportunity is identified. These may arise where burnt areas become more accessible for ground control of weeds, where drought makes control of feral pigs and feral goats more efficient because they congregate in areas where water is available, or when a new biocontrol agent becomes available.

Future priorities for pest control will need to reflect changes in the distribution, abundance or impacts of pests that may occur in response to environmental changes, including climate change. NPWS is supporting research to understand the interaction between climate change, pests and biodiversity.

4 Prioritised regional pest programs

Live versions of this table will be kept on the OEH intranet and updated annually over the five year period of the strategy. Sites are listed in order of priority category, management area, target species and then reserve.

Area	Reserve(s)	Site names	Target pests or weeds	Asset at risk	Aim of Control	Action	Priority
Glen Innes	Gwydir River CCA NP & SCA	1 - Gwydir River CCA NP & SCA	Blackberry, blue heliotrope, box thorn Coolatai grass, Salix spp., tree of heaven, Xanthium spp.	EEC - Howell Shrublands, vulnerable plant Ooline *Cadellia pentastylis,* endangered native milkwort *Polygala linariifolia*, *Dodonea stenophila* - previously believed extinct – found in Mehi during flora survey March 12. Eleven threatened and other priority fauna spp. recorded. (BPWW-CC*)	Asset protection	Spot spraying, bio-control, stem injection/cut stump, basal bark	C-TSC
Glen Innes	Ironbark NR	2630 - Ironbark NR	Blackberry, Coolatai grass, prickly pear spp., Salix spp.	Grassy White Box, Yellow Box, Blakely's Red Gum EEC which contains in addition six known ROTAPS incl. endangered *Homoranthus bornhardtiensis* and *Monotaxus macrophylla* and vulnerable *Goodenia macbarronii.* Eight recorded vulnerable or endangered fauna species, incl. regent honeyeater, border thick-tailed gecko. (BPWW-CC*)	Asset protection	Spot spraying, bio-control, stem injection/cut stump	C-TSC
Glen Innes	Linton NR	30 - Linton NR	Blackberry, Coolatai grass, prickly pear spp., sweet briar	Grassy White Box, Yellow Box, Blakely's Red Gum EEC and several ROTAP species. Regent honeyeater, barking owl, border thick-tailed gecko (BPWW-CC*)	Asset protection	Spot spraying, bio-control	C-TSC

Area	Reserve(s)	Site names	Target pests or weeds	Asset at risk	Aim of Control	Action	Priority
Glen Innes	Little Llangothlin NR	1745 - Little Llangothlin NR	Blackberry, nodding thistle, hemlock	Dry grass swamp – *Glyceria australis*; and grass meadows - *Holcus lanatus* and *Carex gaudichaudiana.* Remnant snow gum communities dominated by *E. pauciflora* and *E. stellulata.* Uplands wetlands of the New England Tablelands EEC (EPBC-e; TSC-e), *Thesium australe* (EPBC-v; TSC-v) (BPWW - CC1)	Asset protection	Spot spray	C-TSC
Glen Innes	Bingara CCA SCA	3 – western and southern boundaries Derra Derra section	Blackberry, St John's wort , Coolatai grass blue heliotrope, African boxthorn, mother of millions, prickly pear	Grassy White Box-Yellow Box Blakely's Red Gum EEC, eighteen threatened fauna species including the endangered regent honeyeater, border thick-tailed gecko. (BPWW - CC1)	Asset protection	Spot spraying, physical removal, bio-control	C-TSC
Glen Innes	Barayamal CCAZ1 NP	2- Barayamal Trail	Blackberry, St Johns wort, tree of heaven, Coolatai grass, privet, osage orange	White box – yellow box; red gum – Yellow box, *Indigophora baileyi* (TSC-e), *Thesium australe* (TSC-v, EPBC-v) (BPWW – CC1)	Asset protection	Spot spray, cut stump, stem injection	C-TSC
Glen Innes	Mann River NR	1773 - Northern and eastern boundary adjacent to Old Grafton Road	Coolatai grass, African lovegrass, giant Parramatta grass	Broad-leafed Stringybark – Grey Gum woodland; Red gum – Bloodwood – Ironbark woodlands. Swamp sclerophyll forest on coastal floodplains EEC (TSC-e), River oak riparian forest/woodlands, *Grevillea scortechinii* subsp. *sarmentosa* (EPBC-v; TSC-v), *Pterostylis woollsii* [ROTAP] (BPWW - CC1)	Asset protection	Spot spray	C-TSC
Glen Innes	Gibraltar Range NP	Gwydir Highway, Mulligans Drive, Mulligans Hut camping area, Pitcocks Trail	Feral cat	Susceptible native fauna - 141 bird species. Examples are spotted quail thrush, noisy pitta, whip birds, rufous scrub bird	Asset protection	Trapping, shooting	C-TSC

Area	Reserve(s)	Site names	Target pests or weeds	Asset at risk	Aim of Control	Action	Priority
Glen Innes	Tingha Plateau CCAZ3 SCA	Ponds Road, access trails	Feral cat	Regent honeyeaters, border thick-tailed gecko. Also brown treecreeper, diamond firetail, speckled warbler, greater long-eared bat, glossy black cockatoo, squirrel glider, and black-throated finches	Asset protection	Trapping, shooting	C-TSC
Glen Innes	Washpool NP	Coachwood Drive, Moogem Trail	Feral cat	Spotted tailed quoll	Asset protection	Trapping	C-TSC
Glen Innes	Warrabah NP	Warrabah NP	Feral cat, fox	Turquoise parrot	Asset protection	Trapping, shooting, baiting	C-TSC
Glen Innes	Gibraltar Range NP	North West fire trail	Feral cattle	*Eucalyptus olida*	Asset protection	Trapping, Judas cattle, ground shooting	C-TSC
Glen Innes	Bingara CCA SCA	Bingara CCA SCA	Feral goat, feral pig	The Grassy White Box EEC	Asset protection	Trapping, aerial shooting	C-TSC
Glen Innes	Linton NR	Linton NR	Feral goat, feral pig	Grassy White Box, Yellow Box, Blakely's Red Gum EEC and several ROTAP species. Regent honeyeater, barking owl. border thick-tailed gecko	Asset protection	Trapping, aerial/ground shooting, baiting	C-TSC
Glen Innes	Ironbark NR	Ironbark NR	Feral goat, feral pig, deer	Grassy White Box, Yellow Box, Blakely's Red Gum EEC which contains in addition six known ROTAPS incl. endangered *Homoranthus bornhardtiensis* and *Monotaxus macrophylla* and vulnerable *Goodenia macbarronii.* Eight recorded vulnerable or endangered fauna species, incl. regent honeyeater, border thick-tailed gecko	Asset protection	Aerial/ground shooting trapping, baiting	C-TSC

Area	Reserve(s)	Site names	Target pests or weeds	Asset at risk	Aim of Control	Action	Priority
Glen Innes	Gwydir River CCA NP & SCA	Gwydir River CCA NP & SCA	Feral goat, feral pigs, deer	EEC - Howell Shrublands, vulnerable plant Ooline *Cadellia pentastylis,* endangered native milkwort *Polygala linariifolia, Dodonea stenophila* - previously believed extinct – found in Mehi during flora survey March 2012	Asset protection	Aerial/ground shooting, trapping	C-TSC
Glen Innes	Warrabah NP	Warrabah NP	Feral pig, feral goat	EEC Howell shrublands + Acacia pubifolia. Rare Quinn's mallee platypus, rare Namoi River Elseya, vulnerable turquoise parrot.	Asset protection	Trapping, aerial/ground shooting, baiting	C-TSC
Glen Innes	Goonoowigal CCAZ3 SCA	Middle Creek main corridor.	Feral pig, feral goat	Cypress pine – orange gum. Howell shrubland EEC (TSC-e), McKies Stringybark/Blackbutt Open Forest EEC (TSC-e), Box Gum woodland EEC (EPBC-ce;TSC-e), Macrozamia humilis (TSC-e), Homoranthus prolixus (TSC-v, EPBC-v), turquoise parrot (TSC-v), diamond firetail (TSC-v)	Asset protection	Trapping, Judas goat, ground/aerial shooting	C-TSC
Glen Innes	Gwydir River CCA NP & SCA	Gwydir River CCA NP & SCA	Rabbit	EEC - Howell Shrublands, vulnerable plant Ooline (*Cadellia pentastylis*), eleven threatened and other priority fauna spp. recorded	Asset protection	Baiting, fumigation, warren destruction	C-TSC
Glen Innes	Little Llangothlin NR	Little Llangothlin NR	Rabbit	Dry grass swamp – *Glyceria australis,* and grass meadows – *Holcus lanatus* and *Carex gaudichaudiana*	Asset protection	Spotlight shooting, baiting	C-TSC

Area	Reserve(s)	Site names	Target pests or weeds	Asset at risk	Aim of Control	Action	Priority
Glen Innes	Goonoowigal CCAZ3 SCA	20 - Middle Creek	Tree of heaven, Coolatai grass, mother of millions, St Johns wort, blackberry, privet, cats claw creeper	Cypress pine – orange gum. Howell shrubland EEC (TSC-e), McKies Stringybark/Blackbutt Open Forest EEC (TSC-e), Box Gum woodland EEC (EPBC-ce;TSC-e), *Macrozamia humilis* (TSC-e), *Homoranthus prolixus* (TSC-v, EPBC-v), turquoise parrot (TSC-v), diamond firetail (TSC-v) (BPWW - CC1)	Asset protection	Spot spray, cut stump	C-TSC
Glen Innes	Barool NP	Nalarla Road, Bark Hut Road, Potters Road	Feral cat	Long-nosed potoroo, spotted-tailed quoll,	Asset protection	Trapping, shooting	C-TSC
Glen Innes	Butterleaf NP	Scotts Trail, Butterleaf Road, Little Audrey Fire Trail, Diamond Trail	Feral cat	Spotted-tailed quoll	Asset protection	Trapping, shooting	C-TSC
Glen Innes	Butterleaf NP	Butterleaf	Feral pig	*E. acaciiformis – Angophora floribunda* – EEC within Montane Peats and Swamps; *Baeckea omissa – Epacris microphylla* - EEC within Montane Peats and Swamps	Asset protection	Trapping, baiting	C-TSC
Glen Innes	Barool NP	1938 - Nalarla Road, Mann River	Honey locust, Crofton weed, small leaf privet, Coolatai grass, African lovegrass, giant Parramatta grass, whisky grass	Dry grassy open forest (high and low elevation) (BPWW - CC1)	Asset protection	Spot spray, cut stump, stem injection, basal bark	C-TSC

Area	Reserve(s)	Site names	Target pests or weeds	Asset at risk	Aim of Control	Action	Priority
Glen Innes	Gibraltar Range NP	1670 - Gwydir Highway, Mulligans Drive	Whisky grass, lantana, crofton weed	Temperate rainforest (highway); *E. olida, E. ligustrina, E. cameronii* dry open forests and woodlands. Gondwana Rainforest [WHA], *Grevillea rhizomatosa* (EPBC-v; TSC-v), *Grevillea mollis* (EPBC-e; TSC-e). (BPWW - CC1)	Asset protection	Spot spray, wick wiper, gas gun	C-TSC
Tenterfield	Bolivia Hill NR	6 - Patagonia Trail, Chile Trail	Blackberry, Coolatai, whisky grass	Stringy bark – blackbutt grassy open forests, box - redgum grassy woodlands. NE and SW sections have New England peppermint *(Eucalyptus nova-anglica*) woodland on basalts and sediments, woollybutt-yellow box grassy woodlands *(Eucalyptus boliviana (*BPWW - CC1)	Asset protection	Spot spray, wick wiper	C-TSC
Tenterfield	Washpool NP (west)	4 Bulls, Wattle Creek Road	Feral cattle	*Dodonaea serratifolia,* blackbutt – messmate forests, blackbutt – die – hard stringybark forest, *Bothriochloa biloba*	Asset protection	Trapping, ground shooting (Judas collar)	C-TSC
Tenterfield	Kwiambal NP	Kwiambal NP	Feral goat	*Acacia williamsianna; Astrotricha roddii; Euphorbia sarcostemmoides; Olearia gravis; Thesium australe.*	Asset protection	Ground shooting and aerial shooting, trapping for goats (water/feed traps)	C-TSC
Tenterfield	Basket Swamp NP	Woollool Woolloolni Road (east of Timbarra trig)	Feral pig	*Solanum nobile; Homoranthus lunatus; Callistris oblonga* spp. *parva*	Asset protection	Trapping, baiting, shooting	C-TSC
Tenterfield	Mt Mackenzie NR	Adjacent to Mt Mackenzie Lookout Rd	Feral pig	*Prostanthera digitiformis*	Asset protection	Trapping, baiting, shooting	C-TSC

Area	Reserve(s)	Site names	Target pests or weeds	Asset at risk	Aim of Control	Action	Priority
Tenterfield	Washpool NP (west)	4 Bulls, 5 Bulls	Feral pig	*Dodonaea serratifolia,* blackbutt – messmate forests, blackbutt – die – hard stringybark forest, *Bothriochloa biloba*	Asset protection	Trapping, baiting, shooting	C-TSC
Tenterfield	Capoompeta NP	Highland Home, Highland Home, Finegans Gap fire trails	Feral pig	*Dodonnaea serratifolia,* blackbutt-mountain gum grassy forests, 2 significant species at risk from feral pig damage, *Bothriochloa biloba*	Asset protection	Trapping, baiting, shooting	C-TSC
Tenterfield	Bluff River NR	Bluff River	Feral pig, feral goat	*Callistemon flavovirens*, 6 vulnerable including *Prostanthera spp, Dodonaea* spp*, Olearia* spp*, Plectranthus* spp*, Acacia* spp*, Eucalyptus* spp.	Asset protection	Aerial/ground shooting, baiting, trapping	C-TSC
Tenterfield	Bolivia Hill NR	Bolivia Hill NR	Feral pig, feral goat	*Boronia boliviensis, Desmodium campylocaulon, Homoranthus croftianus, Pimelia venosa*	Asset protection	Aerial/ground shooting, baiting, trapping	C-TSC
Tenterfield	Kwiambal NP	29 - Severn/Macintyre River. Mother of Millions on Lemon Tree Flat Rd and behind houses	Osage orange, tree of heaven, golden dodder, mother of millions, Noogoora burr	Red gum – apple – river red gum white pine – tumbledown gum, five ROTAP species, Severn wattle *Acacia williamsiana;* Rodd's star hair *Astrotricha roddii;* caustic vine *Euphorbia sarcostemmoides;* daisy bush *Olearia gravis;* toadflax *Thesium australe* (BPWW - CC4)	Asset protection	Foliar spray, cut stump, stem injection	C-TSC
Walcha	Carrai National Park and SCA	2034 - Carrai	Blackberry	Warm temperate rainforest, Hastings River mouse, and at least 10 other threatened fauna species, (BPWW - CC1)	Asset protection	Spot spraying	C-TSC

Area	Reserve(s)	Site names	Target pests or weeds	Asset at risk	Aim of Control	Action	Priority
Walcha	Carrai SCA	1581 - Carrai Waterholes AA	Blackberry	Indigenous cultural heritage values, multiple threatened flora species and EEC (BPWW - CC1)	Asset protection	Spot spraying	C-TSC
Walcha	Ngulin NR	2653 - Ngulin NR	Blackberry	Montane Peatlands and Swamps EEC (BPWW – CC*)	Asset protection	Spot spraying	C-TSC
Walcha	Nowendoc NP	442 - Ruby's nob	Blackberry	Montane Peatlands and Swamps EEC. (BPWW - CC2)	Asset protection	Spot spraying	C-TSC
Walcha	Tuggolo NR	2654 - Tuggolo NR	Blackberry	Montane Peatlands and Swamps and Snowgum Grassy Woodland EECs (BPWW – CC*)	Asset protection	Spot spraying	C-TSC
Walcha	Werrikimbe NP	1869 - Racecourse and Bishops Swamps	Blackberry	*Pterostylis elegans* (TSC-v), *Eupharasia ciliolata* (TSC-v), *Thesium australe* (EPBC-v; TSC-v), Montane Peatlands and Swamps EEC (TSC-e), Ribbon Gum; Mountain Gum; Snow Gum Grassy Forest/Woodland EEC (TSC-e) (BPWW - CC1)	Asset protection	Spot spraying	C-TSC
Walcha	Werrikimbe NP	1792 - Mooraback	Blackberry	*Pterostylis elegans* (TSC-v), *Eupharasia ciliolata* (TSC-v), *Thesium australe* (EPBC-v; TSC-v), Montane Peatlands and Swamps EEC (TSC-e), Ribbon Gum; Mountain Gum; Snow Gum Grassy Forest/Woodland EEC (TSC-e) (BPWW - CC1)	Asset protection	Spot spraying	C-TSC

Area	Reserve(s)	Site names	Target pests or weeds	Asset at risk	Aim of Control	Action	Priority
Walcha	Werrikimbe NP	1757 - Lower Mooraback	Blackberry	World Heritage listed rainforest, Werrikimbe NP *Allitris oblonga* (EPBC-v; TSC-v), *Eupharasia ciliolata* (TSC-v), *Chiloglottis anaticeps* (TSC-e), gazetted wild rivers, wilderness values (BPWW - CC1)	Asset protection	Spot spraying	C-TSC
Walcha	Oxley Wild Rivers NP	2011 - Raspberry Road Precinct -Top Ck, East Kunderang, Macleay R, Kunderang Brook, Chandler River	Blackberry, Lantana	Gondwana dry rainforest (world heritage) riparian zones, open woodland. Cynachum elegans (EPBC-e; TSC-e), Dry Rainforest EEC (TSC-e) [WHA] (BPWW – CC2)	Asset protection	Foliar spraying	C-TSC
Walcha	Oxley Wild Rivers NP	1513 - Apsley and Yarrowitch Rivers and tributaries	Blackberry, lantana and pasture weeds	World Heritage listed dry rainforest, threatened flora species e.g. *Haloragis exalata* subspecies *velutin.* (BPWW – CC1)	Asset protection	Spot spraying	C-TSC
Walcha	Booroolong NR	2631 - Booroolong NR	Blackberry, nodding thistle, *Xanthium* spp.	Vulnerable *Eucalytus nichoii* and ROTAP *Discaria pubescens*. (BPWW-CC*)	Asset protection	Spot spraying	C-TSC
Walcha	Mother of Ducks Lagoon NR	33 - Mother of Ducks Lagoon NR	Blackberry, nodding thistle, Salix spp., St. John's wort, Xanthium spp.	Uplands wetlands of New England Tableland (TSC-e) Habitat for at least 2 flora and 18 fauna species listed as endangered or vulnerable including various migratory avifauna (BPWW - CC1)	Asset protection	Spot spray, chipping, stem injection/cut stump	C-TSC

Area	Reserve(s)	Site names	Target pests or weeds	Asset at risk	Aim of Control	Action	Priority
Walcha	The Basin NR	2632 - The Basin NR	Blackberry, prickly pear spp. Salix spp.	Grassy White Box, Yellow Box, Blakely's Red Gum EEC . Seven ROTAP species. Potential habitat for regent honeyeater, turquoise parrot, border thick-tailed gecko. (BPWW-CC*)	Asset protection	Spot spraying, bio-control, stem injection/cut stump	C-TSC
Walcha	Melville Range NR	1372 - Melville Range NR	Coolatai grass, St Johns wort	Native flora and fauna, Box Gum Woodland EEC (TSC-e, EPBC-ce) (BPWW - CC1)	Asset protection	Foliar spraying	C-TSC
Walcha	Single NP	Single NP	Feral cat, fox	Turquoise parrot, yellow-bellied glider, koala, grey falcon, glossy black cockatoo	Asset protection	Shooting, baiting, trapping	C-TSC
Walcha	Mother of Ducks Lagoon NR	Mother of Ducks Lagoon NR	Feral cat, fox, rabbit	Uplands wetlands of New England Tableland (TSC-e) Habitat for at least 2 flora and 18 fauna species listed as endangered or vulnerable including various migratory avifauna	Asset protection	Baiting, trapping, fumigation	C-TSC
Walcha	Nowendoc NP /Ngulin/Tuggolo Ck NR	Nowendoc NP /Ngulin/Tuggolo Ck NR	Feral goat	Brush-tailed rock-wallabies, Austral toadflax, Dungowan starbush, leafless tongue orchid, elegant greenhood	Asset protection	Aerial/ground shooting, baiting, trapping	C-TSC
Walcha	Oxley Wild Rivers NP	Upper Rowleys Ck, Stony Ck to Apsley Falls, Upper Rusdens	Feral goat	*Acianthus apprimus, Chiloglottis sphyrnoides, Dodonaea rhombifolia,Dodonaea serratifolia, Hibbertia hermanifolia, Leiocarpa serpens, Leionema sp. aff. Gracile,* brush-tailed rock-wallabies	Asset protection	Monitoring, Aerial/ground shooting, baiting, trapping	C-TSC

Area	Reserve(s)	Site names	Target pests or weeds	Asset at risk	Aim of Control	Action	Priority
Walcha	Oxley Wild Rivers NP	Oxley Wild Rivers NP	Feral goat, deer	Cynachum elegans (EPBC-e; TSC-e), Dry Rainforest EEC (TSC-e) [WHA], brush-tailed rock-wallaby	Asset protection	Aerial/ground shooting	C-TSC
Walcha	Indwarra NP	Indwarra NP	Feral goat, feral pig	Undescribed ground orchid, and new genus of bush pea. Endangered regent honeyeater, barking owl, swift parrot, turquoise parrot, border thick-tailed gecko	Asset protection	Aerial shooting	C-TSC
Walcha	Oxley Wild Rivers NP	Apsley and Yarrowitch Rivers and tributaries	Feral horse	*Haloragis exalata* subspecies *velutina* World Heritage Listed dry rainforest, wilderness values	Asset protection	Trapping and removal	C-TSC
Walcha	Nowendoc NP /Ngulin/Tuggolo Ck NR	Nowendoc NP /Ngulin/Tuggolo Ck NR	Feral pig	Montane Peatlands and Swamps EEC.	Asset protection	Aerial/ground shooting, baiting, trapping	C-TSC
Walcha	Oxley Wild Rivers NP	Oxley Wild Rivers NP	Feral pig	*Sarcochilus aequalis, Sarcochilu fitzgeraldii, Thesium australe.* Hastings River mouse, New England tree frog, World Heritage and wilderness values	Asset protection	Aerial/ground shooting, baiting, trapping	C-TSC
Walcha	Oxley Wild Rivers NP	Oxley Wild Rivers NP	Feral pig	Gondwana dry rainforest (world heritage) riparian zones, open woodland. Cynachum elegans (EPBC-e; TSC-e), Dry Rainforest EEC (TSC-e) [WHA]	Asset protection	Trapping, aerial/ground shooting, baiting	C-TSC
Walcha	Booroolong NR	Booroolong NR	Feral pig, deer	Vulnerable *Eucalytus nichoii* and ROTAP *Discaria pubescens*. Habitat for endangered Booroolong frog, bush stone curlew, border thick-tailed gecko, neighbour's livestock	Asset protection	Trapping, aerial/ground shooting, baiting	C-TSC

Area	Reserve(s)	Site names	Target pests or weeds	Asset at risk	Aim of Control	Action	Priority
Walcha	Single NP	Single NP	Feral pig, feral goat	*Eucalyptus nicholli*, *Callistemon pungens*	Asset protection	Aerial and ground shooting, baiting, trapping	C-TSC
Walcha	Werrikimbe NP	Racecourse and Bishops Swamps	Feral pig	Montane Peatlands and Swamps EEC, Werrikimbe NP *Euphrasia ciliolata*	Asset protection	Aerial/ground shooting, baiting, trapping	C-TSC
Walcha	Oxley Wild Rivers NP	Apsley and Yarrowitch rivers and tributaries	Feral pig	*Haloragis exalata* subspecies *velutina,* World Heritage listed dry rainforest	Asset protection	Aerial/ground shooting, baiting, trapping	C-TSC
Walcha	Booroolong NR	Booroolong NR	Rabbit	ROTAP *Discaria pubescens*. Adjoining agricultural enterprises	Asset protection	Shooting, baiting, fumigation	C-TSC
Walcha	Curracabundi NP	302 – Kalungra (Wangera Creek)	*Rubus anglocandicans* (blackberry)	Box Gum Woodland EEC (BPWW – CC1)	Asset protection	Ground spray	C-TSC
Walcha	Nowendoc NP	194 - Christies and Jacky Barker	St Johns wort, blackberry	Montane Peatlands and Swamps EEC, brush-tailed rock-wallaby (EPBC-v;TSC-e) - northern extant of population (BPWW - CC1)	Asset protection	Spot spraying	C-TSC
Glen Innes	Little Llangothlin NR	Little Llangothlin NR	Fox	Livestock	Asset protection	Buried baiting, M44's, trapping, spotlight shooting	C-EC
Glen Innes	Mann River NR	Bald Nob/Skeleton Creek Wild Dog Mgt Plan. Mann River, Bald Nob Creek	Wild dog	Livestock	Asset protection	Aerial/ground baiting, trapping, shooting	C-EC
Glen Innes	Nullamanna CCAZ1 NP	Nullamanna CCAZ1 NP	Wild dog	Livestock	Asset protection	Aerial/ground baiting, trapping, shooting	C-EC
Glen Innes	Butterleaf NP	Deepwater/10 Mile Wild Dog Mgt Plan. Butterleaf Road, Scotts Trail	Wild dog, fox	Livestock	Asset protection	Aerial/ground baiting, trapping, shooting	C-EC

Area	Reserve(s)	Site names	Target pests or weeds	Asset at risk	Aim of Control	Action	Priority
Glen Innes	Guy Fawkes River NP	Pinkett/Red Range Wild Dog Mgt Plan. Henry River Gorge, Stop a Bit Ck, London Bridge, Glen Nevis, Indigo, Williamson's boundary	Wild dog, fox	Livestock	Asset protection	Aerial/ground baiting, trapping, shooting	C-EC
Glen Innes	Kings Plains NP	Kings Plains NP	Wild dog, fox	Livestock	Asset protection	Aerial/ground baiting, trapping, shooting	C-EC
Glen Innes	Warra NP	Pinkett/Red Range Wild Dog Mgt Plan Horseshoe bend Trail, Moggs Swamp Trail	Wild dog, fox	Livestock, spotted-tailed quoll, red-necked wallaby, dark brown swamp wallaby, yellow-tailed black cockatoo, glossy black cockatoo, masked owl	Asset protection	Aerial / ground baiting, trapping, shooting	C-EC
Tenterfield	Bald Rock NP	Bald Rock NP	Wild dog	Livestock	Asset protection	Aerial/ground baiting, trapping, shooting	C-EC
Tenterfield	Boonoo Boonoo NP	Boonoo Boonoo NP	Wild dog	Livestock	Asset protection	Aerial/ground baiting, trapping, shooting	C-EC
Tenterfield	Maryland NP	Plan for the Management of Wild Dogs and their Impacts. January 2011 to December 2016.	Wild dog	Neighbouring stock	Asset protection	Monitor - sandpadding, infra-red cameras; 1080 baiting, softjaw trapping	C-EC
Tenterfield	Basket Swamp NP	Basket Swamp NP	Wild dog	Livestock	Asset protection	Ground baiting, trapping, shooting	C-EC
Tenterfield	Capoompeta NP	Deepwater/10 Mile Wild Dog Mgt Plan. Highland Home, Finegans Gap fire trails	Wild dog, fox	Livestock	Asset protection	Aerial/ground baiting, trapping, shooting	C–EC
Tenterfield	Dthinna Dthinnawan CCAZ1 NP	Dthinna Dthinnawan CCAZ1 NP	Wild dog, fox	Livestock, delicate mouse (*pseudomys delicatulus)* (TSC-e)*;* crowned gecko *(Diplodactylus steinachneri)* (TSC v) – most easterly distribution	Asset protection	Aerial/ground baiting, trapping, shooting	C-EC

Area	Reserve(s)	Site names	Target pests or weeds	Asset at risk	Aim of Control	Action	Priority
Tenterfield	Kwiambal NP	Kwiambal NP	Wild dog, fox	Livestock	Asset protection	Aerial/ground baiting, trapping, shooting	C-EC
Tenterfield	Severn River NR	Severn River NR	Wild dog, fox	Livestock	Asset protection	Aerial/ground Baiting, trapping, shooting	C-EC
Tenterfield	Arakoola NR	Arakoola NR	Wild dog, fox control	Livestock	Asset protection	Ground baiting, trapping, shooting	C-EC
Tenterfield	Bluff River NR	Bluff River NR	Wild dog, fox control	Livestock	Asset protection	Aerial/ground baiting, trapping, shooting	C–EC
Tenterfield	Bolivia Hill NR	Bolivia Hill NR	Wild dog, fox control	Livestock	Asset protection	Aerial/ground baiting, trapping, shooting	C–EC
Tenterfield	Washpool NP (west)	Steinbrook/Sandy Flat Wild Dog Mgt Plans Spirabo Forest Way, Farnell Rd, Billyrimba Rd	Wild dog, fox control	Livestock	Asset protection	Aerial/ground baiting, trapping, shooting	C-EC
Tenterfield	Torrington SCA	Torrington SCA	Wild dog, fox, cat	Livestock	Asset protection	Aerial/ground baiting, trapping, shooting	C-EC
Walcha	Booroolong NR	Booroolong NR	Feral cat, fox	Regent honeyeater, border thick-tailed gecko, Booroolong frog, bush stone curlew	Asset protection	Trapping, shooting, baiting	C-EC
Walcha	Oxley Wild Rivers NP	Oxley Wild Rivers NP	Fox, feral cat	Livestock, brush-tailed rock-wallaby, Hastings River mouse	Asset protection	Shooting, baiting, trapping	C-EC
Walcha	Nowendoc NP /Ngulin/Tuggolo Ck NR	Nowendoc NP /Ngulin/Tuggolo Ck	Nodding thistle	Neighbouring properties	Asset protection	Spot spraying	C-EC
Walcha	Carrai National Park and SCA	Carrai National Park and SCA	Wild dog	Livestock	Asset protection	Aerial/ground baiting, trapping, shooting	C-EC

Area	Reserve(s)	Site names	Target pests or weeds	Asset at risk	Aim of Control	Action	Priority
Walcha	Oxley Wild Rivers NP	Blue Nobby, Cooney Creek and Jeogla Wild Dog Mgt Plans	Wild dog	Livestock	Asset protection	Aerial baiting, ground baiting, trapping, exclusion fencing, shooting	C-EC
Walcha	Back River NR	Barnard River WDMP	Wild dog	Livestock	Asset protection	Ground baiting	C-EC
Walcha	Curracabundi NP	Barnard River WDMP	Wild dog	Livestock	Asset protection	Aerial and ground baiting	C-EC
Walcha	Tomalla NR	Hunter Valley WDMP	Wild dog	Livestock	Asset protection	Ground baiting	C-EC
Walcha	Cottan-bimbang NP and SCA	Cottan-bimbang NP and SCA Yarrowitch/ Tia Wild Dog Mgt Plan	Wild dog, fox	Livestock	Asset protection	Aerial/ground baiting, trapping, shooting	C-EC
Walcha	Mummel Gulf NP and SCA	Yarrowitch/ Tia and Nowendoc Wild Dog Mgt Plans	Wild dog, fox	Livestock	Asset protection	Aerial/ground baiting, trapping, shooting	C-EC
Walcha	Nowendoc NP /Ngulin/Tuggolo Ck NR	Yarrowitch/ Tia and Niangala Wild Dog Mgt Plans	Wild dog, fox	Livestock	Asset protection	Aerial/ground baiting, trapping, shooting	C-EC
Walcha	Oxley Wild Rivers NP	Oxley Wild Rivers NP Yarrowitch/ Tia and Moona / Winterbourne Wild Dog Mgt Plans	Wild dog, fox	Livestock, brush-tailed rock-wallabies, koala	Asset protection	Aerial/ground baiting, trapping, shooting	C-EC
Walcha	Avondale SCA	Avondale SCA	Wild dog, fox, feral cat	Livestock, vulnerable eastern false pipistrelle, barking owl. eastern bent-wing bat, long-nosed potoroo, eastern cave bat	Asset protection	Baiting, trapping, ground shooting	C-EC
Walcha	Werrikimbe NP	Yarrowitch/ Tia Wild Dog Mgt Plan	Wild dog, foxes	Livestock	Asset protection	Aerial/ground baiting, trapping, shooting	C-EC

Area	Reserve(s)	Site names	Target pests or weeds	Asset at risk	Aim of Control	Action	Priority
Glen Innes	Washpool NP Gibraltar Range NP	Coombadja, Desert, Washpool and Dandarah Creeks	Amphibian chytrid fungus		Containment	Monitor	C-NE
Glen Innes	Warrabah NP	Visitor area	Coolatai grass		Containment	Spot spraying , chipping	C-NE
Glen Innes	Kings Plains NP	Kings Plains NP	Fallow deer		Containment	Trapping	C-NE
Glen Innes	Kings Plains NP	Kings Plains NP	Fallow deer		Containment	Aerial shooting program	C-NE
Glen Innes	Mann River NR	Mann River NR	Honey locust		Containment	Foliar spray, cut stump, basal bark	C-NE
Glen Innes	Nymboida NP	Cunglebung Ck Trails, Mosquito Cks	Mysore thorn		Eradication	Foliar spray, cut stump, basal bark	C-NE
Tenterfield	Maryland NP	Entire reserve – roadsides – African lovegrass	African love grass		Containment	Bush regeneration techniques including, overspray	C-NE
Tenterfield	Maryland NP	Entire reserve – roadsides - coolatai	Coolatai grass		Containment	Bush regeneration techniques including, overspray	C-NE
Tenterfield	Kwiambal NP	Severn/Macintyre River. Mother of millions on Lemon Tree Flat Rd and behind houses	Honey locust		Containment	Foliar spray, cut stump, stem injection	C-NE
Walcha	Mummel Gulf NP	Eastern Boundary Trail	Agapanthus		Eradication	Hand removal	C-NE
Walcha	Cottan-bimbang NP and SCA	1844 - Oxley Hwy	Coolatai grass		Containment	Spot spraying	C-NE
Walcha	Mummel Gulf NP	380 - Oxley Hwy	Coolatai grass		Eradication	Spot spraying	C-NE

Area	Reserve(s)	Site names	Target pests or weeds	Asset at risk	Aim of Control	Action	Priority
Walcha	Oxley Wild Rivers NP	Kunderang Brook	Coolatai grass		Eradication	Burning and foliar spraying	C-NE
Walcha	All reserves	All reserves	Myrtle rust		Containment	Minimise spread with hygiene methods and closure of affected areas	C-NE
Walcha	Werrikimbe NP	Racecourse Trail, Werrikimbe Trail	Phytophthora (*Phytophthora cinnamomi*)		Containment	Use restrictions in wet weather	C-NE
Walcha	Yina NR	Yina NR	Serrated tussock		Eradication	Spot spraying, chipping	C-NE
Walcha	Imbota NR	Imbota NR	Serrated tussock		Eradication	Spot spray, physical removal	C-NE
Walcha	Oxley Wild Rivers NP	Macleay / Chandler Rivers	Tree of heaven		Containment	Foliar spraying, stem injection, basal bark	C-NE
Walcha	Cunnawarra NP	Cunnawarra NP	Tropical soda apple		Eradication	Monitoring, foliar spraying, manual removal	C-NE
Walcha	Georges Creek NR	Georges Creek NR	Tropical soda apple		Eradication	Monitoring, foliar spraying, manual removal	C-NE
Walcha	Oxley Wild Rivers NP	Riparian zone -Macleay River, Kunderang Brook	Tropical soda apple		Eradication	Monitoring, foliar spraying, manual removal	C-NE
Glen Innes	Washpool NP	Bicentennial Trail, Moogem Trail	Feral cattle	Gondwana World Heritage, dry escarpment open forest/sclerophyll	Asset protection	Trapping (yards), Judas cattle, ground shooting	H-IH
Glen Innes	Washpool NP	Washpool Creek, Moogem Fire Trail, Gwydir Highway	Lantana, giant Parramatta grass, crofton weed, whisky grass, Coolatai grass	Gondwana World Heritage, dry escarpment open forest/sclerophyll	Asset protection	Spot spray	H-IH

Area	Reserve(s)	Site names	Target pests or weeds	Asset at risk	Aim of Control	Action	Priority
Walcha	Oxley Wild Rivers NP	1732 - Kunderang Brook	Blackberry, lantana	World Heritage listed dry rainforest, threatened flora species including *Sarcochilus aequalis, Sa-rcochil-us fitzgeraldii, Thesium australe*, (BPWW -CC4)	Asset protection	Spot spraying	H-IH
Walcha	Oxley Wild Rivers NP	Chandler / Macleay	Horse	Macleay Gorges and the Kunderang Wilderness areas - riparian zones	Asset protection	Trapping and removal	H-IH
Walcha	Cunnawarra NP	1992 - Cunnawarra NP	Lantana	Gondwana dry rainforest (World Heritage) riparian zones, open woodland (BPWW - CC5)	Asset protection	Foliar spraying	H-IH
Tenterfield	Severn River NR	Aboriginal Art sites	Feral goat	Aboriginal art sites	Asset protection	Exclusion fencing	H-CH
Tenterfield	Severn River NR	Severn River	Feral pig and feral goat control	Aboriginal art sites	Asset protection	Aerial/ground shooting, trapping	H-CH
Tenterfield	Dthinna Dthinnawan CCAZ1 NP	Inverary house	Rabbit	Houses and infrastructure	Asset protection	Fumigation, ground shooting, baiting	H-CH
Tenterfield	Kwiambal NP	Kwiambal house/workshop	Rabbit	Houses and infrastructure	Asset protection	Fumigation, ground shooting, 1080 baiting	H-CH
Walcha	Mt. Yarrowyck NR	Mt. Yarrowyck NR	Feral goat, feral pig	Important Aboriginal rock art site. Four vulnerable avifauna species present. Habitat for border thick-tailed gecko	Asset protection	Aerial and ground shooting, baiting, trapping	H-CH
Glen Innes	Nymboida NP	Cunglebung, Kaloe, Cunglebung Ck Trails; Cunglebung, Wellington, Mosquito Cks; – Mann River	Blackberry, lantana, whisky grass, Coolatai grass, giant Parramatta grass, honey locust	Riparian complex communities, Binderry-Mann Wilderness Area	Asset protection	Foliar spray, cut stump, basal bark	M-WNH

Area	Reserve(s)	Site names	Target pests or weeds	Asset at risk	Aim of Control	Action	Priority
Glen Innes	Nymboida NP	Mann River, Cunglebung, Mosquito, Wellington Cks	Feral cattle	Binderry-Mann Wilderness Area, riparian complex communities	Asset protection	Trapping (yards), Judas cattle, ground shooting	M-WNH
Glen Innes	Guy Fawkes River NP	London Bridge, Glen Nevis, Corner Camp Fire Trails, Boyd River	Giant Parramatta Grass, Coolatai grass, blackberry, lantana	Guy Fawkes Wilderness Area. Dry open forest woodland – *Eucalyptus crebra*	Asset protection	Spot spray	M-WNH
Walcha	Oxley Wild Rivers NP	Riparian zones	Blue Heliotrope	Macleay Gorges Wilderness Area	Asset protection	Bio-control	M-WNH
Walcha	Nowendoc NP	Tuggolo Ck	Feral horse	Curracabundi Wilderness Area	Asset protection	Develop plan to remove horses	M-WNH
Walcha	Oxley Wild Rivers NP	Oxley Wild Rivers NP	Prickly pear	Macleay Gorges Wilderness Area	Asset protection	Foliar spray, bio-control	M-WNH
Walcha	Oxley Wild Rivers NP	Gara Gorge	Privet	Macleay Gorges Wilderness Area	Asset protection	Foliar spraying, stem injection, basal bark, cut stump	M-WNH
Walcha	Oxley Wild Rivers NP	Oxley Wild Rivers NP	Xanthium	Macleay Gorges Wilderness Area	Asset protection	Foliar spraying	M-WNH
Glen Innes	Horton Falls CCA NP	Horton Falls CCA NP	Sweet briar	Stringybark and ironbark dominant forests and woodlands, various vulnerable woodland species	Asset protection	Spot spraying	M-RA
Walcha	Cottan-bimbang NP and SCA	Cottan-bimbang NP and SCA	Blackberry and Crofton weed	High visibility impacting aesthetics of rainforest vegetation	Asset protection	Spot spraying	M-RA
Glen Innes	Kings Plains NP	2633 - Kings Plains NP	African lovegrass, Coolatai grass, blackberry, whisky grass, privet	Ironbark – Cypress Woodlands; Apple – River oak riparian woodlands (BPWW – CC4)	Asset protection	Spot spray, cut stump	M-CP
Glen Innes	Warialda CCA NP & SCA	Warialda CCA, NP & SCA	Box thorn, Coolatai grass, prickly pear spp.	Grassy White Box, Yellow Box, Blakely's Red Gum EEC - habitat for border thick-tailed gecko, turquoise parrot	Asset protection	Spot spraying, bio-control	M-CP

Area	Reserve(s)	Site names	Target pests or weeds	Asset at risk	Aim of Control	Action	Priority
Glen Innes	Hobden Hill NP	Hobden Hill NP	Box thorn, Coolatai grass, prickly pear spp., St. John's wort	Grassy White Box - Yellow Box - Blakely's Red Gum EEC	Asset protection	Spot spraying, bio-control, stem injection/cut stump	M-CP
Glen Innes	Serpentine Ridge NP	Serpentine Ridge NP	Box thorn, Coolatai grass, prickly pear spp., St. John's wort	Hummock grassland/open woodland on serpentinite ridges and Ironbark open forests	Asset Protection	Spot Spraying, bio-control, stem injection/cut stump	M-CP
Glen Innes	Woodsreef SCA	Woodsreef SCA	Boxthorn, Coolatai grass, prickly pear spp., St. John's wort	New reserve with diversity of habitats including hummock grassland/open woodland on serpentinite ridges and ironbark open forests	Asset protection	Spot spraying, bio-control, stem injection/cut stump	M-CP
Glen Innes	Tingha Plateau CCAZ3 SCA	Main access trails	Coolatai grass, whisky grass	Grassy White Box - Yellow Box - Blakely's Red Gum EEC, cypress pine – orange gum	Asset protection	Foliar spray	M-CP
Glen Innes	Horton Falls CCA NP	Horton Falls CCA NP	Feral goats	Stringybark & ironbark dominant forests and woodlands, various vulnerable woodland species	Asset protection	Aerial and ground shooting	M-CP
Glen Innes	Serpentine Ridge NP	Serpentine Ridge NP	Feral pig, feral goat	Hummock grassland / open woodland on serpentinite ridges and Ironbark open forests	Asset protection	Trapping, aerial/ground shooting, baiting	M-CP
Glen Innes	Warialda CCA NP & SCA	Warialda CCA, NP & SCA	Feral pig, feral goat	Grassy White Box, Yellow Box, Blakely's Red Gum EEC - habitat for border thick-tailed gecko and turquoise parrot	Asset protection	Trapping, aerial/ground shooting, baiting	M-CP
Glen Innes	Woodsreef SCA	Woodsreef SCA	Feral pig, feral goat	New reserve with diversity of habitats incl. hummock grassland/open woodland on serpentinite ridges and ironbark open forests	Asset protection	Trapping, aerial/ground shooting, baiting	M-CP
Glen Innes	Hobden Hill NP	Hobden Hill NP	Feral pig, feral goat	Grassy White Box - Yellow Box - Blakely's Red Gum EEC	Asset protection	Trapping, shooting, baiting	M-CP

Area	Reserve(s)	Site names	Target pests or weeds	Asset at risk	Aim of Control	Action	Priority
Glen Innes	Kings Plains NP	Kings Plains NP Kings Plains Creek – Eastern boundary, 3 Waterholes Creek, Wean Creek	Feral pig, feral goat	Apple – river oak riparian woodlands, predation on amphibian species, ironbark – cypress woodlands	Asset protection	Aerial / ground baiting, trapping, shooting	M-CP
Glen Innes	Ironbark NR	Ironbark NR	Fox, feral cat	Native fauna	Asset protection	Baiting, trapping, shooting	M-CP
Glen Innes	Linton NR	Linton NR	Fox, feral cat	Native fauna	Asset protection	Trapping, shooting, baiting	M-CP
Glen Innes	Warialda CCA NP & SCA	Warialda CCA, NP & SCA	Fox, feral cat	Native fauna	Asset protection	Trapping, shooting, baiting	M-CP
Glen Innes	Woodsreef SCA	Woodsreef SCA	Fox, feral cat	Native fauna	Asset protection	Trapping, shooting, baiting	M-CP
Glen Innes	Serpentine Ridge NP	Serpentine Ridge NP	Fox, wild dog, feral cat	Native fauna, livestock	Asset protection	Trapping, shooting, baiting	M-CP
Glen Innes	Ironbark NR	Ironbark NR	Rabbit	Grassy White Box - Yellow Box - Blakely's Red Gum EEC containing six known ROTAPS including endangered *Homoranthus bornhardtiensis* and *Monotaxus macrophylla* and vulnerable *Goodenia macbarronii*	Asset protection	Fumigation, baiting	M-CP
Glen Innes	Linton NR	Linton NR	Rabbit	Grassy White Box - Yellow Box - Blakely's Red Gum EEC and several ROTAP species	Asset protection	Warren destruction, shooting, baiting, fumigation	M-CP
Glen Innes	Warrabah NP	Warrabah NP	*Salix* spp., blackberry, blue heliotrope, prickly pear spp., *Xanthium* spp.	EEC Howell shrublands and *Acacia pubifolia*, rare Quinn's mallee, platypus, rare Namoi River elseya, vulnerable turquoise parrot	Asset protection	Spot spraying, bio-control, stem injection/cut stump	M-CP

Area	Reserve(s)	Site names	Target pests or weeds	Asset at risk	Aim of Control	Action	Priority
Tenterfield	Boonoo Boonoo NP	2634 - Martins Flat, Colongin Road	Blackberry, Coolatai, whisky grass, lovegrass, giant Parramatta grass	Shrubby open forests. ROTAP species include *Acacia macnuttiana, Daviesia elliptica, Callistemon flavovirens* (BPWW – CC3)	Asset protection	Spot spray/wick wiper, physical/mechanical control, monitoring	M-CP
Tenterfield	Washpool NP (west)	2635 - 4 Bulls, 5 Bulls, Farnell Road, Wattle Creek Road	Blackberry, giant Parramatta grass	Blackbutt – messmate forests, blackbutt – die – hard stringybark forest (BPWW – CC3)	Asset protection	Spot spray, wick wiper	M-CP
Tenterfield	Curry's Gap SCA	48 - Curry's Trail, local watercourses	Blackberry, tiger pear, African lovegrass, privet.	Apple – cabbage gum woodlands, New England peppermint – yellow box woodlands	Asset protection	Foliar spray, cut stump	M-CP
Tenterfield	Bald Rock NP	2636 - Carolls Creek, Airstrip Trail, Bookookoorara Trail, Resurrection Trail. North Boundary Trail	Blackberry; Coolatai, whisky grass, lovegrass & fire weed	Moist tall open forests, grassy tall open forests, ROTAP species include *Persoonia daphnoides, Acacia adunca* (BPWW – CC3)	Asset protection	Spot spray, physical/mechanical control, monitoring	M-CP
Tenterfield	Dthinna Dthinnawan CCAZ1 NP	Nicholls Road	Feral goat	White cypress – silver leafed, smooth barked apple – black cypress, grassy chenopod, red gum, bulloak-white cypress	Asset protection	Ground and aerial shooting, trapping	M-CP
Tenterfield	Dthinna Dthinnawan CCAZ1 NP	Middle Creek, Inverary	Feral pig	White cypress – silver leafed, smooth barked apple – black cypress, grassy chenopod, red gum, bulloak-white cypress	Asset protection	Ground and aerial shooting, trapping, baiting	M-CP
Tenterfield	Kwiambal NP	Severn/Macintyre River	Feral pig	White pine – tumbledown gum, white pine – silver ironbark – box, red gum – apple – river red gum	Asset protection	Ground and aerial shooting, baiting, trapping	M-CP
Tenterfield	Arakoola NR	Ottley Creek, Trig point, Spring Creek	Feral pig, feral goat	Rough barked apple-bottlebrush creek lines, white box basalt woodland	Asset protection	Ground shooting and aerial shooting	M-CP

Area	Reserve(s)	Site names	Target pests or weeds	Asset at risk	Aim of Control	Action	Priority
Tenterfield	Torrington SCA	Duck Creek, Carpet Snake Creek, Butlers Fire Trail	Feral pig, feral goat	Shrubby forests and woodlands on granite/ rocky outcrops on the Mole granite	Asset protection	Aerial/ground shooting, baiting, trapping	M-CP
Tenterfield	Curry's Gap SCA	Curry's Trail	Fox	Livestock	Asset protection	Trapping, ground baiting	M-CP
Tenterfield	Basket Swamp NP	2637 - Basket Swamp Rd, Basket Swamp trail, Woollool Woolloolni Road	Giant Parramatta grass	Blackbutt-stringy bark grassy open forests, blackbutt-stringy bark shrubby open forests. One vulnerable and nine ROTAP listed plant species (BPWW – CC3)	Asset protection	Spot spray/wick wiper	M-CP
Tenterfield	Severn River NR	54 - Severn River, Rocky Road Trail	Honey locust, osage orange, tree of heaven, Coolatai grass, Noogoora burr	Rough barked apple river banks tea-tree shrublands and grasslands. ROTAP species include *Astrotricha roddii, Boronia grantica, Homoranthus biflorus, Micromyrtus grandis* (BPWW – CC4)	Asset protection	Foliar spray, cut stump, stem injection	M-CP
Tenterfield	Maryland NP	1776 - Maryland NP	*Hyparrhenia hirta, Lantana camara, Rubus fruticosis* agg*., Eragrostis curvula, Andropogon virginicus*	Grey Gum - Blackbutt - Rough Barked Apple Open Forest, Stringybark Woodland; BPWW – CC3	Asset protection	Bush regeneration techniques including, overspray; and splatter gun	M-CP
Tenterfield	Timbarra NP	2638 - McCleods Trail, eastern boundary	Lantana	Brush box-turpentine (BPWW – CC3)	Asset protection	Spot spray	M-CP
Tenterfield	Maryland NP	Maryland	Rabbit	Grey Gum - Blackbutt - Rough Barked Apple Open Forest, Stringybark Woodland	Asset protection	Pindone baiting	M-CP
Tenterfield	Arakoola NR	43 - Ottley Creek, Spring Creek	Willows, Peach, Tree of Heaven	Rough barked apple-bottlebrush creek lines	Asset protection	Spot spray, cut stump, stem injection	M-CP

Area	Reserve(s)	Site names	Target pests or weeds	Asset at risk	Aim of Control	Action	Priority
Walcha	Avondale SCA	Avondale SCA	Blackberry	Very significant open woodland for bird species - vulnerable eastern false pipistrelle, barking owl, eastern bent-wing bat, long-nosed potoroo, eastern cave bat	Asset protection	Spot spraying	M-CP
Walcha	Imbota NR	Imbota NR	Blackberry		Containment	Spot spraying	M-CP
Walcha	Indwarra NP	Indwarra NP	Blackberry		Containment	Spot spraying	M-CP
Walcha	Mummel Gulf NP and SCA	Boundary areas	Blackberry	Park values, neighbour relations	Asset protection	Spot spraying	M-CP
Walcha	Stony Batter Creek NR	Stony Batter Creek NR	Blackberry	Grassy White Box, Yellow Box, Blakely's Red Gum EEC habitat for border thick-tailed gecko and turquoise parrot	Asset protection	Spot spraying	M-CP
Walcha	Single NP	2628 - Single NP	Blackberry	Numerous flora and fauna species listed as vulnerable including *Eucalyptus nicholli*, *Callistemon pungens,* koala, grey falcon, glossy black cockatoo (BPWW – CC3)	Asset protection	Spot spraying, bio-control	M-CP
Walcha	Duval NR	2629 - Duval NR	Blackberry (fox harbour)	Threatened *Boronia granitica* predicted Potential habitat for border thick-tailed gecko, turquoise parrot, significant densities of greater glider, common ringtail (BPWW – CC4)	Asset protection	Spot spraying	M-CP
Walcha	Mt. Yarrowyck NR	Mt. Yarrowyck NR	Blackberry, prickly pear spp.	Important Aboriginal rock art site, four vulnerable avifauna species present, habitat for border thick-tailed gecko	Asset protection	Spot spraying, bio-control	M-CP

Area	Reserve(s)	Site names	Target pests or weeds	Asset at risk	Aim of Control	Action	Priority
Walcha	Watsons Creek NP	Watsons Creek NP	Blackberry, prickly pear spp.	Native orchids, boronia and cycads occur on the reserve, five ROTAP species and potential habitat for several fauna species listed as vulnerable	Asset protection	Spot spraying, bio-control	M-CP
Walcha	Yina NR	Yina NR	Blackberry, prickly pear spp.	Open forest/woodland, 45 bird, 4 mammal species, vulnerable koala, barking owl	Asset protection	Spot spraying, bio-M-CP control	M-CP
Walcha	Imbota NR	Imbota NR	Chilean needle grass		Containment	Spot spraying	M-CP
Walcha	Single NP	Single NP	Coolatai grass, prickly pear spp., Xanthium spp.	Numerous flora and fauna species listed as vulnerable including *Eucalyptus nicholli*, *Callistemon pungens*	Asset protection	Spot spraying, bio-control	M-CP
Walcha	Mt. Yarrowyck NR	42 - Mt. Yarrowyck NR	Coolatai grass, African love grass	Important Aboriginal rock art site, four vulnerable avifauna species present, habitat for border thick-tailed gecko (BPWW - CC4)	Asset protection	Spot spraying, bio-control	M-CP
Walcha	Yina NR	Yina NR	Feral cat, fox	Open forest/woodland, 45 bird, 4 mammal species, vulnerable koala, barking owl	Asset protection	Baiting, trapping	M-CP
Walcha	Melville Range NR	Melville Range NR	Feral goat	Native flora and fauna	Asset protection	Shooting, trapping, mustering	M-CP
Walcha	The Basin NR	The Basin NR	Feral goat, feral pig	Seven ROTAP species. Potential habitat for regent honeyeater, turquoise parrot, border thick-tailed gecko	Asset protection	Aerial and ground shooting, baiting, trapping, fumigation	M-CP
Walcha	Watsons Creek NP	Watsons Creek NP	Feral goat, feral pig	Native orchids, boronia and cycads occur on the reserve, five ROTAP species and potential habitat for several fauna species listed as vulnerable	Asset protection	Aerial and ground shooting, baiting, trapping	M-CP

Area	Reserve(s)	Site names	Target pests or weeds	Asset at risk	Aim of Control	Action	Priority
Walcha	Aberbaldie NR	Aberbaldie NR	Feral pig	Native flora and fauna, neighbouring landholders	Asset protection	Ground shooting and trapping	M-CP
Walcha	Mummel Gulf NP and SCA	Mummel Gulf NP and SCA	Feral pig	Native flora, park values, neighbour relations	Asset protection	Poisoning, trapping.	M-CP
Walcha	Stony Batter Creek NR	Stony Batter Creek NR	Feral pig	Three ROTAP species, habitat for vulnerable border thick-tailed gecko and turquoise parrot	Asset protection	Trapping, aerial/ground shooting, baiting	M-CP
Walcha	Aberbaldie NR	Aberbaldie NR	Fox	Native fauna	Asset protection	Ground baiting	M-CP
Walcha	Melville Range NR	Melville Range NR	Fox	Native fauna and livestock	Asset protection	Ground baiting	M-CP
Walcha	Duval NR	Duval NR	Fox, feral cat	Potential habitat for border thick-tailed gecko, turquoise parrot, significant densities of greater glider, common ringtail	Asset protection	Trapping, ground shooting, baiting	M-CP
Walcha	Imbota NR	Imbota NR	Fox, feral cat	Native fauna	Asset protection	Baiting, trapping	M-CP
Walcha	Mt. Yarrowyck NR	Mt. Yarrowyck NR	Fox, feral cat	Native fauna	Asset protection	Shooting, baiting, trapping	M-CP
Walcha	Stony Batter Creek NR	Stony Batter Creek NR	Fox, feral cat	Native fauna	Asset protection	Shooting, baiting	M-CP
Walcha	The Basin NR	The Basin NR	Fox, feral cat	Native fauna	Asset protection	Shooting, baiting, trapping	M-CP
Walcha	Watsons Creek NP	Watsons Creek NP	Fox, wild dog, feral cat	Native fauna, livestock on adjacent lands	Asset protection	Shooting, baiting, trapping	M-CP
Walcha	Georges Creek NR	Georges Creek NR	Lantana, blackberry, blue heliotrope	Cool temperate rainforest, subtropical rainforest and wet sclerophyll communities	Asset protection	Foliar spraying	M-CP

Area	Reserve(s)	Site names	Target pests or weeds	Asset at risk	Aim of Control	Action	Priority
Walcha	Duval NR	Duval NR	Rabbit	Threatened *Boronia granitica* predicted	Asset protection	Shooting, baiting, fumigation	M-CP
Walcha	Mt. Yarrowyck NR	Mt. Yarrowyck NR	Rabbit		Containment	Baiting, fumigation	M-CP
Walcha	Oxley Wild Rivers NP	Oxley Wild Rivers NP	Rabbit		Containment	Baiting, fumigating, ripping, bio control, shooting	M-CP
Walcha	Imbota NR	Imbota NR	Rabbits		Containment	Fumigation and warren destruction	M-CP
Walcha	Single NP	Single NP	Rabbits		Containment	Baiting, fumigation	M-CP
Walcha	Yina NR	Yina NR	Rabbits		Containment	Fumigation	M-CP
Tenterfield	Dthinna Dthinnawan CCAZ1 NP	17 - Middle Creek, Browns Creek Old homestead	Mother of millions, cats claw creeper		Containment	Foliar spray, biological control – citrus thrip (cats claw creeper)	M-II
Walcha	Oxley Wild Rivers NP	Gara Gorge, Salisbury Waters,	African love grass		Containment	Foliar spraying, manual removal	M-II
Walcha	Mummel Gulf NP	Dicks Hut area	Blackberry		Containment	Spot spraying	M-II
Walcha	Mummel Gulf NP and SCA	Road & trail sides	Crofton weed		Containment	Spot spraying	M-II
Walcha	Oxley Wild Rivers NP	Raspberry Road Precinct	Giant Parramatta Grass		Containment	Foliar spraying	M-II
Walcha	Georges Creek NR	Kempsey Road	Giant Parramatta grass		Containment	Spot spraying, physical removal	M-II
Walcha	Oxley Wild Rivers NP	Oxley Wild Rivers NP	Indian myna		Containment	Ground shooting, trapping.	M-II
Walcha	Oxley Wild Rivers NP	Riparian zones	Willow		Containment	Stem injection	M-II

Area	Reserve(s)	Site names	Target pests or weeds	Asset at risk	Aim of Control	Action	Priority
Glen Innes	Tingha Plateau CCAZ3 SCA	Middle Creek	Feral pig, feral goat	White box – yellow box, red gum – yellow box, cypress pine – orange gum	Asset protection	Ground and aerial shooting, baiting	L-LP
Tenterfield	Maryland NP	Roadsides	Blackberry (*Rubus fruticosus aggregate*		Containment	Overspray	L-LP
Tenterfield	Dthinna Dthinnawan CCAZ1 NP	Middle Creek, Inverary	Feral cattle	Grassy chenopod, red gum, bulloak-white cypress	Asset protection	Trapping, ground shooting (Judas collar)	L-LP
Tenterfield	Curry's Gap SCA	Curry's Trail	Feral pig	Apple-Cabbage gum woodlands, New England Peppermint – Yellow Box Woodlands	Asset protection	Pig trapping and 1080 baiting program	L-LP
Walcha	Aberbaldie NR	Aberbaldie NR	Blackberry	Native flora	Asset protection	Spot spraying	L-LP
Glen Innes	Mann River NR	Mann River – south of camping area	Feral pig	Red gum – bloodwood – ironbark woodlands, amphibian species in riparian environment	Asset protection	trapping	L-PP
Glen Innes	Warra NP	Horseshoe bend Trail, Moggs Swamp Trail	Feral pig	Stringybark, grassy open forests, manna gum – messmate, open forests	Asset protection	Baiting, trapping	L-PP
Glen Innes	Nullamanna CCAZ1 NP	Nullamanna CCAZ1 NP	Feral pig, feral goat	Tumbledown gum – black pine	Asset protection	Aerial shooting	L-PP
Tenterfield	Bald Rock NP	Carolls Creek, Fairy Valley, Airstrip trail, 2 Mile Trail, Leahey's Trail	Feral pig	Moist tall open forests, grassy tall open forests	Asset protection	Trapping, baiting, shooting	L-PP
Tenterfield	Boonoo Boonoo NP	Martins Flat, Mackay Trail	Feral pig	Shrubby open forests, moist tall open forests, grassy tall open forests	Asset protection	Pig trapping and 1080 baiting program	L-PP
Tenterfield	Taringa NR	Taringa	Feral pig, feral goat	Silver leaf ironbark – white box woodland	Asset protection	Aerial/ground shooting, baiting, trapping	L-PP

Area	Reserve(s)	Site names	Target pests or weeds	Asset at risk	Aim of Control	Action	Priority
Walcha	Curracabundi NP	Site 139 Barnard River	*Ailanthus altissima* (tree of heaven), *Vinca major* (blue periwinkle), *Echium plantagineum* (Paterson's curse), *Rubus anglocandicans* (blackberry)	Native vegetation – (BPWW – CC4)	Asset protection	Ground spray, bush regeneration	L-PP

* Not yet ranked as of June 2012

5 Consultation

This regional pest management strategy was developed through an open consultation process involving identified stakeholders, community representatives and regional staff. A regional pest management strategy stakeholder forum was conducted in Armidale on 1 September 2011. Issues from that forum were later addressed at the state peak stakeholder roundtable on 15 November 2011. The participants included local representatives of catchment management authorities, Livestock Health and Pest Authorities, weeds authorities, local government, Game Council, regional advisory committees (NEPAAC, FAAC), wild dog control associations, National Parks Association, NSW Farmers and Department of Primary Industries.

Key issues raised from this forum, with reference to the state strategy, included:

- the need for a landscape approach to all pest management with increased cooperation and coordination of all pest control programs (Goal 2 Objective 2.2)
- the need for a high priority to be given to preventing the establishment of new pest species on NPWS lands within the Region, e.g. tropical soda apple (*Solanum viarum* Dunal) (Goal 1 Objective 1.1)
- the need for more coordinated control of wild dogs, across all tenures and regional boundaries, to counter increasing livestock predation (Goal 2 Objective 2.2)
- the need to increase the level of control across the Region for all pest species, particularly wild dogs, feral goats, feral pigs and deer (Goal 2 Objective 2.2)
- the need to use all available legal and humane control methods to achieve integrated management of pest species, and to investigate and include, where appropriate, new or alternative techniques such as the M44 ejector used for wild dog and fox control (Goal 2 Objective 2.2)
- consideration of the establishment of exclusion and containment zones within reserves with permanent bait stations to act as a buffer to the movement of pest species into and out of reserves (Goal 2 Objective 2.2)
- the need to map pest species, monitor the effectiveness of control programs and identify movement pathways and potential threats (Goal 3 Objective 3.4)
- the need for improved communication and public education to raise awareness of pest management issues and the public's responsibilities under the relevant legislation (Goal 3 Objective 3.2).

A number of important issues were raised that are beyond the scope of a regional pest management strategy. These issues have been directed to the NSW State Pest Forum and/or to the relevant control authority.

Workshops to accurately identify and prioritise pest management programs were conducted with key staff from each operational Area.

The draft pest management strategy was placed on public exhibition in December 2011 and submissions were invited from the general community, other government agencies and stakeholder groups. Eight submissions were received and have been considered in the preparation of the final regional pest management strategy. NTR staff maintain ongoing liaison with other key stakeholders within the Region. Staff are active members of the Northern Inland Weeds Advisory Committee, the North East Pest Animal Advisory Committee and the Northern Region Feral Animal Advisory Committee. They are also in regular contact with other government agencies, weed control authorities, wild dog control associations, conservation groups and neighbours.

6 Pest species overviews

Information about high profile pests for this Region is summarised below. More details regarding the distribution, impacts and management options for these and other pest species can be found in other reference documents, including on the internet.[2]

Deer

Distribution and abundance

Deer are widespread across north-eastern New South Wales at low to medium densities. Fallow deer (*Dama dama*), red deer (*Cervus elaphus*) and rusa deer (*Cervus timorensis*) are all present in the Region. Their presence has been confirmed in numerous reserves. The distribution and density of deer in the Northern Tablelands is increasing rapidly and the management of deer is an issue for NPWS in this Region.

Impacts

Feral deer impact by selective browsing, spreading weeds, wallowing, rubbing trees and other vegetation and causing erosion through scrapes and pads. Their browsing can impact on native vegetation by preventing the establishment of seedlings and reducing seed reproduction of established plants. While some threatened species may be impacted by this selective browsing, it can also lead to changes in vegetation communities with more palatable species being reduced and less palatable species becoming dominant. Furthermore, native animals that rely on native plant species for food or shelter may be impacted through competition with feral deer.

Herbivory and environmental degradation caused by feral deer is listed as a KTP under the TSC Act.

Deer graze on native flora and compete with native fauna for food and shelter. Where there is overlap between deer distribution and the presence of species listed as threatened or as a ROTAP, impacts could be severe. The impact of deer has not yet been fully assessed in the Region, but as their density and distribution increase the impact may be significant in some locations.

There are also increasing reports of motor vehicle accidents caused by deer crossing roads between dusk and dawn.

Priorities for control

Control will be implemented in areas where deer are causing a measurable impact on flora or fauna species or are impacting on neighboring agricultural enterprises. A priority will also be given to control of deer in new areas where they have not yet become established.

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[2] http://www.dpi.nsw.gov.au/agriculture/pests-weeds/vertebrate-pests/general-information/pest-animal-survey
http://environment.gov.au/biodiversity/invasive/publications/humane-control.html
http://www.invasiveanimals.com/
http://www.environment.gov.au/biodiversity/invasive/ferals/index.html
http://www.environment.nsw.gov.au/threatenedspecies/KeyThreateningProcessesByDoctype.htm
http://www.dpi.nsw.gov.au/agriculture/pests-weeds/weeds/profiles
http://www.weeds.org.au/WoNS/
http://www.rirdc.gov.au/programs/national-rural-issues/weeds/weeds_home.cfm
http://www.weeds.gov.au/

Control

- Conduct cooperative control programs with adjoining landholders such as aerial shooting, spotlight shooting and trapping.
- All deer control will be carried out in accord with the appropriate code of practice and standard operating procedures.

Monitoring

Monitoring will include surveys to measure changes in the distribution, density and species of deer on reserves in the NTR. Survey methods may include sand plot monitoring, remote cameras, dung counts and liaison with neighbouring landholders. Reports of sightings by NPWS staff, neighbours and the general public will be recorded and entered into the pest database.

Feral cat (*Felis catus*)

Distribution and abundance

Feral cats are found at low to medium densities throughout the tablelands and occur in nearly all reserves within NTR.

Impacts

A range of native species, including birds, small mammals, reptiles and rodents, are subject to predation by feral cats. Due to the cryptic nature of feral cats and lack of cost-effective monitoring techniques it is difficult to determine the level of impact cats have on native species population within NTR. Feral cats also compete with native predators, such as the spotted-tailed quoll, for food.

Endangered or threatened species within the Region at risk from feral cat predation include the regent honeyeater, Hastings River mouse and Border thick-tailed gecko.

Priorities for control

Feral cat control is generally a low to medium priority for the Region. Planned feral cat control programs will only be initiated where there is an established need to protect endangered or threatened species or for other identified management purposes. At this point a cat control program has only been identified for Gibraltar Range NP and Washpool (West) NP. Opportunistic control may be undertaken in conjunction with pest management of other species or field activities.

Control

All feral cat control will be carried out in accordance with the appropriate code of practice and standard operating procedures. Control methods for feral cats may include cage trapping, padded-jaw trapping and shooting. Other new methods of control will be assessed and implemented if found to be effective.

Monitoring

Currently there are no cost-effective methods for monitoring the abundance of feral cats or their impact on native wildlife. Monitoring will be limited to the opportunistic collection of data by staff during field operations or from remote cameras used in research programs. All data, whether feral cat sightings or control, will be entered into the regional pest database.

Feral goat (*Capra hircus*)

Distribution and abundance

Feral goats occur across a wide range of habitats in all states of Australia. Within NTR, feral goat populations are largely restricted to native vegetation remnants in hilly to mountainous areas of both public and private lands.

They are present in more than 30 reserves within the Region, with the highest densities being on the western slopes of the tablelands. The density and distribution of goat populations varies between reserves.

Impacts

Grazing and browsing by feral goats has significant impacts on native vegetation. They can lead to changes in species composition and vegetation structure. Areas with a high density of goats have a conspicuous browse line, as all foliage within the reach of goats is consumed.

Feral goats can survive on highly fibrous, low nutrient herbage provided sufficient water is available, and will consume litter, fruit fall, bark and sticks. This can lead to a decrease in overall cover and an increase in bare ground. This, combined with trampling and soil surface damage caused by their hooves, may result in significant increases in soil erosion. These habitat changes in turn affect native fauna, which may also be impacted by feral goats through competition for food, water and shelter.

Competition and habitat degradation by feral goats has been listed as a key threatening process under the TSC Act. In NTR there are 28 species listed as endangered or vulnerable under the TSC Act which are impacted upon by feral goats. These include mammals, reptiles and plants, as well as four endangered ecological communities. Feral goats also cause damage to Aboriginal heritage sites, compete with neighbouring livestock and are potential vectors of livestock diseases.

Harvesting of feral goats has become an important income source for some landholders, and this view of goats as a potential resource needs to be taken into consideration when conducting control programs.

Priorities for control

High priority sites for feral goat control in NTR are Oxley Wild Rivers NP, Warrabah NP, Ironbark NR, Mount Yarrowyck NR, Gwydir River NP, Torrington SCA, Bolivia Hill NR, Kwiambal NP, Bluff River NR and Severn River NR. These reserves have a high density of goats and/or a high number of goat vulnerable threatened entities (GVTEs).

Dthinna Dthinnawan CCA, Taringa NR, Arakoola NR, Kings Plains NP, The Basin NR and Nullamanna CCA are medium priority sites, having a high density of goats but a lower number of GVTEs.

Washpool NP, Single NP, Nowendoc NP and Indwarra NR have lower densities of feral goats and fewer GVTEs, and are considered low priority sites for feral goat control.

Control

Effective control of feral goats requires an integrated approach using several complementary control techniques. In NTR, the main control techniques are aerial shooting, ground shooting, mustering and trapping. In addition, landholders adjacent to reserve boundaries are being encouraged to reduce feral goat numbers through mustering and trapping. For areas such as Warrabah NP, Kwiambal NP, Ironbark NR

and Severn River NR, aerial shooting programs will be conducted to maintain or reduce the current goat density.

All feral goat control will be carried out in accordance with the appropriate code of practice and standard operating procedures.

Monitoring

Changes in the relative abundance of feral goats are assessed during successive aerial shoots and trapping or mustering programs by comparing kills (cull rate compared from shoot to shoot) or captures per unit effort (time). The impacts of feral goats on vegetation and erosion have previously been investigated in NTR, resulting in a number of publications; however no monitoring programs are currently in operation.

Feral horse (*Equus caballus*)

Distribution and abundance

In NSW, feral horses are a significant problem within a number of conservation reserves along the Great Dividing Range and eastern seaboard.

Feral horses occur within three NTR reserves: Oxley Wild Rivers NP, Guy Fawkes River NP and Nowendoc NP. The most significant population within the Region is in Oxley Wild Rivers NP which is estimated to contain in excess of 600 horses. The majority of feral horses in Guy Fawkes River NP are within the portion of the park managed by the North Coast Region, with only a small number in NTR. A very small population of feral horses (less than 20) graze on the periphery of Nowendoc NP with their home range predominantly in the Hunter Region or on adjoining private property.

Impacts

Feral horses accelerate erosion through trampling, compaction and grazing. They also impact on native vegetation and ground-nesting birds, foul water holes and contribute to the spread of weeds. In high altitude alpine herb fields trampling and grazing of bog and fen communities creates gully lines along horse trails that drain these sensitive communities. In water catchment areas, feral horse impacts accelerate soil erosion that increases sedimentation and potential transference of dangerous pathogens into water supplies. As horse density within conservation reserves increases, their impacts on the environment become more significant.

In Oxley Wild Rivers NP, impacts in the form of compacted horse pads, disturbance of soil, stream bank damage and heavy grazing of native and introduced flora is evident. Soil erosion and increased weed growth has also been noted in areas frequented by feral horses.

Priorities for control

Oxley Wild Rivers NP has been identified as the highest priority for feral horse control in NTR. In Guy Fawkes River NP, the Region will work closely with North Coast Region to remove feral horses from the NTR portion of the park. A feral horse management plan has been adopted for both of these reserves.

Control

In Oxley Wild Rivers NP the initial control method has been the use of feed-based lures to draw horses into portable trap yards. Captured horses have then been transported from the park and made available to identified horse interest groups or individuals for rehoming. Other control techniques may be developed and used later

in the program as required. All feral horse control will be carried out in accordance with the appropriate code of practice and standard operating procedures.

Monitoring

The effectiveness of the horse removal program in Oxley Wild Rivers NP will be assessed by measuring changes in horse population, distribution and density over time. Grazing exclusion plots, photo points and botanical surveys will be used to assess changes in plant regeneration, species diversity and weed growth.

Feral pig (*Sus scrofa*)

Distribution and abundance

Feral pigs are widely distributed throughout the northern slopes and tablelands, across all tenures. They have been recorded in more than 50 reserves throughout NTR. Higher populations generally occur along watercourses, around swamps and in areas with adequate harbour such as blackberry, bracken and forest.

Impacts

Feral pigs, a declared pest animal in NSW under the *Rural lands Protection Act 1988*, are a serious environmental and agricultural pest. Their habit of wallowing and rooting for food can cause soil erosion, silting and weed growth. They are known to predate on a number of native mammals, including ground-nesting birds, reptiles and amphibians.

Numerous endangered or threatened species within NTR are susceptible to pig predation, as well as impacts to the Montane Peatlands and Swamps Endangered Ecological Community.

Feral pig impacts on agriculture include lamb predation and damage to crops, pasture, fences and watering points. They also act as carriers of endemic livestock diseases and are potential carriers of exotic diseases. Because of these impacts and their large home range, feral pig activity on reserves can be a contentious issue with neighbours, requiring a cooperative approach for effective management.

Priorities for Control

Feral pig control is a critical priority for the protection of threatened species and EECs in all reserves where they occur within NTR. Reserves to be included in regular control programs include Oxley Wild Rivers NP, Werrikimbe NP, Single NP, Mummel Gulf NP and SCA, Nowendoc NP, Warrabah NP, Kwiambal NP, Bald Rock NP, Boonoo Boonoo NP, Capoompeta NP, Washpool NP (west), Torrington SCA, Bolivia Hill NR, Warra NP, Arakoola NR, Dthinna Dthinnawan NP, Kings Plains NP, Mount Yarrowyck NR, Ngulin NR, Booroolong NR and Ironbark NR.

Control

Fully integrated programs that use aerial shooting, trapping or poisoning as the primary control techniques will be used to control feral pigs in NTR. A landscape approach to control will be used wherever possible, working cooperatively with the local LHPA and neighbouring land managers.

All feral pig control will be carried out in accordance with the appropriate code of practice and standard operating procedures.

Monitoring

Feral pig populations and distribution will be monitored in reserves across the Region. Data relating to sightings and signs of pig activity such as rooting and wallowing will be recorded and entered into the regional pest database.

Red fox (*Vulpes vulpes*)

Distribution and abundance

Foxes are widespread throughout NTR with the highest concentrations in the fragmented environment of agricultural areas. These areas offer a wide variety of food, cover and den sites. Fox densities are generally lower in mountainous, heavily forested areas, typical of the majority of NPWS estate in the Region.

Impacts

The introduction of the red fox (*Vulpes vulpes*) into Australia in the 1870s has contributed to regional declines and extinctions of a wide range of native fauna, particularly among medium-sized ground-dwelling and semi-arboreal mammals, ground-nesting birds and freshwater turtles. Thus the spread of foxes across southern Australia in the late 1800s and early 1900s coincided with regional extinctions of several species of bettongs, the greater bilby, numbat, bridled nailtail wallaby and quokka. Many of these species persist only on islands or areas of the mainland where foxes are rare or absent. Similarly, foxes have been linked to regional extinctions of four species of ground-nesting birds from western NSW and the decline of a further seven such species. More recent experimental studies have shown that foxes continue to suppress populations of several species of rock-wallabies, the eastern grey kangaroo, brush-tailed bettong, long-nosed potoroo, numbat, several species of bandicoots, common brushtail possum, common ringtail possum and Murray River turtle. Foxes have also caused the failure of numerous attempts to reintroduce threatened native fauna into areas of their former range.

As an agricultural pest, foxes can have a significant impact on newborn sheep or goats and on poultry. Recent studies have shown they can account for up to 30% of lamb deaths in some areas.

Priorities for control

Priorities for fox control for the conservation of biodiversity are detailed in the NSW Fox Threat Abatement Plan.[3] Foxes are also controlled as part of cooperative neighbour programs where they have impacts on neighbouring livestock. The highest priority site in the Region is Little Llangothlin Nature Reserve (a Ramsar site).

Control

Fox control will be carried out in accordance with the appropriate code of practice and standard operating procedures.

Control will use the buried bait station technique with 1080 poison as the primary control method. Trail baiting, spotlight shooting, fumigation of dens and trapping will be secondary methods.

Control programs will be implemented in a cooperative manner where neighbours and local pest animal control groups are involved. NPWS will support and participate in local and regional joint control initiatives and encourage landholders to participate in coordinated group control programs.

[3] www.environment.nsw.gov.au/pestsweeds/Foxes.htm

Monitoring

Surveys will be undertaken to measure:

- Short-term reduction in fox density during critical breeding periods for threatened species or during crucial lambing periods.
- change in spotted-tail quoll populations, and other vulnerable or threatened species such as the Hastings River mouse.

Rabbit (*Oryctolagus cuniculus*)

Distribution and abundance

Rabbit populations are essentially contiguous throughout New England and the Northern Slopes, with their highest density in semi-open grazing country. They are present at low to very low densities on numerous reserves throughout the Region.

Impacts

Rabbits have significant impacts on native vegetation. Selective grazing and browsing of more palatable species leads to changes in species composition and habitat structure and, even at low densities, rabbits can prevent the regeneration of impacted species through consumption of seed and seedlings. During drought, rabbits will also consume the bark and roots of native species, resulting in the death of large numbers of plants. Their digging activities also scratch out seedlings and damage root systems and, combined with the damage they cause to both above and below ground vegetation, can lead to increased soil erosion. The resultant habitat degradation in turn affects native fauna, which may also be impacted by rabbits through competition for food and shelter. Rabbits also provide a food source for cats and foxes, maintaining high numbers of these introduced predators which in turn impact on native prey species.

Competition and grazing by European rabbits has been listed as a key threatening process under the TSC Act, and rabbits are also a declared pest animal under the *Rural Lands Protection Act 1998*. Rabbits can cause damage to Aboriginal heritage sites, compete with neighbouring livestock and impact forestry operations. The impacts of rabbits have been reduced since the release of myxomatosis and more recently rabbit haemorrhagic disease (RHD), however even at low densities rabbits can prevent the regeneration of impacted plant species, and recent reports suggest rabbit numbers may be increasing again.

Priorities for control

The density of rabbits is low to very low on most reserves in NTR and in many cases is far higher on adjoining private property. Consequently, priority will be given to undertaking rabbit control where it is part of a coordinated program across all tenures. Medium priority sites in NTR are Oxley Wild Rivers NP, Booroolong NR, Little Llangothlin NR, Bolivia Hill NR, Washpool NP (west), Severn River NR, Dthinna Dthinnawan NP, Linton NR, Imbota NR and Torrington SCA.

Control

Effective control of rabbits requires an integrated approach using several complementary control techniques. In NTR, the main control techniques used will be warren ripping, warren fumigation and baiting. All rabbit control will be carried out in accordance with the appropriate code of practice and standard operating procedures.

Monitoring

The location of warrens and above ground harbour where rabbits are seen to shelter will be mapped during field inspections. This data will be entered into the regional pest and weed information system. Rabbit population abundances will be monitored using spotlight counts, walk transect counts, counts of warrens and counts of active entrances.

Wild dog (*Canis lupus* sspp.)

Distribution and abundance

The term wild dog refers to any dogs living in the wild, including feral dogs (*Canis lupus familiaris*), dingoes (*Canis lupus dingo*) and their hybrids. Populations of wild dogs (including dingoes) occur mainly along the Great Dividing Range, coastal hinterlands and in north-western NSW. In NTR they occur on private and public lands and are most prevalent in densely timbered areas along the escarpment. In recent years, sightings and predation have been increasing on the western slopes and plains in areas such as Bingara, Warialda, Coolatai and Yetman.

Wild dogs have been recorded in a number of reserves within NTR, from Washpool NP, Gibraltar Range NP and Oxley Wild Rivers NP, to Nowendoc NP in the south. Western reserves where isolated wild dog activity has recently been reported include Arakoola, Dthinna Dthinnawan, Gwydir River, Kwiambal and Serpentine Ridge.

Impacts

Wild dogs can cause substantial losses to livestock enterprises, especially sheep and goat grazing operations. As a result, wild dogs have been declared a pest under the *Rural Lands Protection Act 1998*. Under the Act, managers of controlled land have an obligation to eradicate wild dogs by any lawful method. All land in NSW is identified as controlled land under the current Pest Control Order for Wild Dogs.[4] These impacts are widespread in the eastern half of NTR, with the heaviest losses occurring where forested and gorge areas interface with fine-wool sheep country. The western boundary of Oxley Wild Rivers NP, which encompasses much of the Macleay gorges, typifies this interface with the adjoining open grazing country of the New England Tablelands between Armidale and Walcha.

Wild dogs can have both positive and negative impacts on biodiversity. Predation by wild dogs can suppress the abundance of herbivores (both native and exotic) which may be important in reducing overgrazing across much of arid and semi-arid Australia. Wild dogs may also suppress smaller exotic predators (cats and foxes) with potential benefits for a broad suite of small to medium-sized ground-dwelling mammals and ground-nesting birds. Conversely, predation by wild dogs may have significant direct impacts on threatened species (e.g. koalas).

The dingo was introduced into Australia from Asia prior to European settlement and hence it is eligible to be listed as a threatened species under the TSC Act. Although the dingo has not been listed as a threatened species, predation and hybridisation by feral dogs (*Canis lupus familiaris*) has been listed as a Key Threatening Process under the TSC Act.

In order to balance the need for wild dog control with the conservation of dingoes, the Pest Control Order for Wild Dogs allows the general destruction obligation for lands listed under Schedule 2 of the Order to be satisfied through the preparation of a wild dog management plan with both control and conservation objectives.

[4] www.gazette.nsw.gov.au/pdfs/2009/11th_September.pdf

Priorities for control

Wild dog management plans are prepared in conjunction with the local LHPA and wild dog control associations (WDCAs). While the overarching management plans are developed by the LHPA, operational plans are negotiated with individual WDCAs on an association area basis.

Priorities for wild dog control on reserves in NTR are based primarily on the level of livestock predation reported by adjoining landholders, in accord with the relevant wild dog management plans. Control will be focused on reserves where there are current and/or historic records demonstrating significant impact on livestock from wild dogs emanating from the reserves. There will be close liaison with the local WDCA and landholders when developing control programs.

Priority will also be given to protection of the brush-tailed rock-wallaby in the Green Gully area of Oxley Wild Rivers NP. If research indicates that predation by wild dogs does pose a significant threat, control will be undertaken to ensure the long-term viability of these populations.

Control

A fully integrated suite of control techniques will be used to manage wild dogs within NTR. Control programs will be undertaken in partnership with the local LHPA, WDCA and individual landholders. Strategic control, aimed at preventing future livestock predation, will include:

- exclusion or barrier fencing where the terrain is suitable and there is sufficient support from neighbouring landholders
- aerial baiting in the more rugged inaccessible areas where other control techniques may not be cost-effective
- ground or mound baiting and trapping in accessible areas.

Reactive control in response to reports of livestock predation or dog activity will include:

- ground or mound baiting
- trapping using either NPWS staff or contract trappers
- 'howling up' and shooting.

Monitoring

Stock losses due to predation by wild dogs are reported monthly to the LHPA by each WDCA. This information is used by the Region to evaluate the effectiveness of control programs negotiated as part of the wild dog management planning process.

Wild dog abundance and activity on reserves is monitored via track counts, remote cameras, sightings and bait takes from mound bait stations. This data is entered in the pest database and used to refine wild dog control programs.

Research undertaken by the Invasive Animal Cooperative Research Centre, using satellite collaring and other monitoring techniques, has provided valuable additional data in relation to the movements and response to control of wild dogs and other predators. In the Region, initial research has been undertaken in Walcha Area with extensive support from local staff. From 2012 the research has been extended in to reserves in the northern part of the Region.

African lovegrass (*Eragrostis curvula*)

Distribution and abundance

African lovegrass is a widespread weed in Tenterfield LGA, with small scattered infestations present in Bald Rock NP and Boonoo Boonoo NP. Infestations are also located in other reserves in NTR. Roadside slashing and burning on access roads to national park areas has increased the density and distribution of this weed dramatically since around 2002, and is the main dispersal method for this weed in the Tenterfield Area.

Impacts

This summer-growing perennial grass establishes from seed and has the potential to invade native communities by forming dense swards of tussocks. This weed is extremely aggressive, and has the ability to outcompete many native grasses, particularly after fire or droughts when native flora species are suppressed. Seed dispersal is facilitated by machinery and vehicles, warranting the implementation of hygiene measures to reduce seed spread. African lovegrass is a declared noxious weed.

Priorities for control

- Areas where infestation levels are minor and scattered such as Bald Rock and Boonoo Boonoo national parks and Currys Gap SCA.
- Boundary areas where infestations in neighbouring lands are encroaching onto NPWS managed lands.

Control

- Map infestations on a regional basis.
- Vehicle and machinery hygiene is essential to reduce the spread of this weed. Vehicles or machinery that travel through infested areas should be thoroughly washed down before moving to areas where the weed is not present.
- Established infestations are best treated with herbicide in February and March, preferably with wick application. Spot spraying is not selective and will remove all competition, resulting in quick re-invasion. Hand chipping can be used where infestations are small.
- Cooperative programs with neighbours and local councils should be encouraged to suppress and control this weed.

Monitoring

- Map annual control to confirm reduction in distribution and density.

Blackberry (*Rubus fruticosus* agg.)

Distribution and abundance

The term blackberry covers at least 14 different but closely related species, including hybrids that have become naturalised in Australia.

Blackberry rarely invades virgin bushland but readily establishes in disturbed areas on agricultural lands, roadsides, banks of watercourses, forests and bushland. It is common throughout temperate Australia in areas where rainfall is greater than 750

mm per annum. Blackberry is widespread on the slopes and tablelands and occurs in numerous reserves in NTR.

Impacts

Blackberry is a Weed of National Significance because of its invasiveness, potential for spread, and economic and environmental impacts. It is listed under the Noxious Weeds Act throughout most of NSW.

Blackberry is a sprawling perennial shrub that has long thorn-covered stems (canes) that can form large thickets which exclude light from the soil surface. Thickets can grow to several metres high and seriously impede regeneration of native flora species through competition for moisture, soil nutrients and light. Large, dense infestations can restrict access to watercourses by native fauna and park users.

It also provides significant harbour for rabbits, foxes, feral pigs and other pest animal species.

Priorities for control

Blackberry is a high priority for control on reserves within NTR. Major control programs include programs in Guy Fawkes River NP, Little Llangothlin NR, Bald Rock NP, Boonoo Boonoo NP, Currys Gap SCA, Warra NP, Oxley Wild Rivers NP, Boorolong NR, Nowendoc NP and Werrikimbe NP. Priorities for control include:

- new or emerging infestations, or where current distribution is limited
- areas where conservation values are threatened
- areas where public access to natural features is restricted
- previously treated areas that require adequate follow-up control to prevent reinfestation.

Control

- Reduce distribution and potential to spread by treatment with herbicide.
- Carry out follow-up treatment as required for a minimum of 10 years or until there is no further regrowth.
- Trial biocontrol agents to determine effectiveness as a control measure.

Monitoring

- Map the distribution of blackberry on NPWS estate.
- Establish photopoints to monitor re-establishment.
- Undertake regular surveys to measure changes in distribution and density.
- Record the quantity of herbicide used at each location, measured annually.

Cat's claw creeper (*Macfadyena unguis-cati*)

Distribution and abundance

Cat's claw creeper is present along the Clarence River in private lands, where it is having a major impact on the riparian community. This weed also occurs along the eastern fringes of Guy Fawkes River NP at Dalmorton in North Coast Region, and there are isolated infestations around abandoned forestry houses on the western boundary of Dthinna Dthinnawan NP.

Impacts

In 2012, cat's claw creeper became a Weed of National Significance. It is a vine which forms dense mats over trees and threatens the biodiversity of riparian and rainforest communities. It spreads rapidly along the fringing tree lines of watercourses choking vegetation, killing trees and contributing to bank erosion and siltation.

Large underground tubers produce climbing runners that form a thick carpet of stems and leaves that choke out small existing plants and stop germination of all other species. The large climbing stems cause the eventual death of the largest canopy trees through a combination of weight and shading.

Priorities for control

- Isolated infestations on NPWS estate.
- Boundary areas where infestations in neighbouring lands are encroaching onto NPWS estate.

Control

- Map current infestations across NTR.
- Contain and reduce present infestations with strategic herbicide application.
- Monitor and frequently follow-up control for a minimum of five years.
- Monitor the progress of infestations in riparian areas within one kilometre of national park boundaries and encourage cooperative control with neighbours to prevent dispersal of the weed onto NPWS estate.

Monitoring

- Map annual control programs to confirm containment of existing infestation and reduction in distribution and density.

Coolatai grass (*Hyparrhenia hirta*)

Distribution and abundance

Coolatai grass is an aggressive weed that has become established in many reserves across NTR. It is more prevalent in western reserves as it was originally introduced into the Coolatai area. However, this weed is now common in eastern reserves both above and below the escarpment. The most common dispersal method is by vehicle and stock movement along roadsides and stock routes.

Impacts

This weed, due to its ability to spread rapidly, is quickly dominating grassy box woodland habitats and other vegetation communities. It completely smothers existing vegetation, is drought tolerant and is one of the major threats to native pasture and woodland biodiversity.

Priorities for control

- Isolated infestations or new incursions where effective control will prevent further distribution of the weed (e.g. Guy Fawkes River NP, Nymboida NP, Mummel Gulf NP, Cottan-bimbang NP and Oxley Wild Rivers NP).
- Where infestations are impacting upon the conservation values of an area.

- Riparian areas where downstream effects will significantly boost distribution.
- The western edge of Mt Yarrowyck NR, extending into it by up to 400 metres, nominated as a priority site under the BPWW program.

Coolatai grass occurs extensively along roads, on private and public lands in the western portions of NTR. It is present in a number of reserves in these areas but due to the extent of distribution control is not considered a viable option.

Control

- Vehicle and machinery hygiene is essential to reduce the spread of this weed. All vehicles or machinery that travel through infested areas should be thoroughly washed down before moving to areas where this weed is not present.
- Established infestations are best treated with glyphosate when plants are actively growing in February and March, preferably with wick application. Spot spraying is not selective and will remove all competition, resulting in quick re-invasion. Hand chipping can be used where infestations are small.
- Cooperative programs with neighbours and local councils should be encouraged to suppress and control this weed.

Monitoring

- Map annual control programs to confirm containment of existing infestation and reduction in distribution and density.

Crofton weed (*Ageratina adenophora*)

Distribution and abundance

Crofton weed, a native of Mexico, is now widespread in coastal areas from southern Queensland to Wollongong. Isolated infestations occur on the northern and central tablelands. This weed has been recorded mainly in eastern escarpment reserves in NTR, primarily in the Glen Innes and Walcha areas. The infestations usually occur in disturbed areas, particularly along roadsides.

Impacts

Crofton weed is an aggressive plant that competes successfully with native flora species. It forms dense swards where conditions suit, excluding native species. The effectiveness of control programs is often limited due to access problems created by the plant's preference for steeply sloping areas with rainfall in excess of 1500 mm per annum.

Priorities for control

The control of Crofton weed is generally considered to be of low to medium priority in NTR. Control programs will aim to prevent any new infestations establishing and setting seed. Priority will also be given to the control of smaller isolated infestations where there is adequate access for spraying equipment.

Control

Control suitable for Crofton weed management in conservation areas include mechanical, chemical and biological techniques.

- Contain present infestations with strategic herbicide application.
- Treat as priority any new, isolated infestations.

Monitoring

Infestations of Crofton weed will be systematically mapped and monitored to identify any changes to distribution or density.

Giant Parramatta grass (*Sporobolus indicus* v. *major*)

Distribution and abundance

Giant Parramatta grass, a significant weed of the North Coast of NSW, occurs in numerous reserves along the eastern escarpment and also in some western reserves.

Seed dispersal is facilitated by machinery and vehicles, warranting the implementation of hygiene measures to reduce transportation of seed.

Impacts

Giant Parramatta grass is an aggressive perennial weed that has invaded large areas of land on the north coast of NSW. An extremely prolific seeder, it has the potential to colonise large areas of NPWS estate, dominate native species and alter the fire regime. It can dominate disturbed areas such as fire trails and roadsides where seed is frequently transported due to vehicles and machinery.

Giant Parramatta grass is a declared noxious weed and is an identified species of exotic perennial grasses listed as a KTP.

Priorities for control

- Frequently used access trails (to reduce spread to other areas).
- Areas where low density populations exist and native flora species have good natural regeneration ability.

Control

- Selectively treat (wick wiper) existing infestations with herbicide to encourage competition from native species.
- Prevent giant Parramatta grass from becoming established in new areas on NPWS estate.
- Train all field-based staff to identify giant Parramatta grass to ensure early detection of any new infestations.
- Prevent further spread by:
    - erecting temporary fencing and signs at each infestation
    - ensuring vehicles operating in the area are inspected and cleaned before moving to new areas
    - reducing the unauthorised use of management trails.

Monitoring

- Map the distribution of giant Parramatta grass on reserves within the Region.
- Map annual control programs to confirm reduction in distribution and density.

Honey locust (*Gleditsia triacanthos*)

Distribution and abundance

This weed occurs in several reserves in the Glen Innes and Tenterfield Areas.

The tree is found predominantly in riparian areas and is found on the banks of the Severn, Macintyre and Mann rivers, and is rarely found at distances of more than 400 m from a watercourse.

The populations in all areas consists mostly of mature honey locust trees (up to 6 m high), with large numbers of seedlings in some areas. Control programs have drastically reduced infestations along the Severn, Macintyre and Mann rivers; however, the weed is still a major problem in these areas.

Impacts

This weed is an invasive tree capable of outcompeting and replacing native vegetation. It is a serious pest and, when disturbed mechanically or by fire, it can produce dense regrowth, eventually forming impenetrable thickets. Seed is spread by floodwaters or by stock and feral animals that eat the seed and pass it in their dung.

Long spines along the branches and trunk can inflict painful injuries to humans and native fauna species. It can form dense thickets preventing access to waterways.

Priorities for control

- Control is a high priority in Mann River NP and Barool NP (both follow-up and initial control).
- Infestations in Severn River NR and Kwiambal NP are at low densities due to intensive control programs over the previous 10 years. Follow-up control is still required to reduce re-establishment.

Control

- Herbicide application using basal bark application for mature trees or foliar application for seedlings when trees are actively growing.
- Participation with neighbours and catchment management initiatives to reduce establishment of new infestations on NPWS estate.
- Extensive follow-up control for a minimum of five years to reduce seedling growth to prevent re-establishment.

Monitoring

- Map distribution on NPWS estate across the Region.
- Map control programs to confirm reduction in distribution and density (local eradication considered possible in some areas).

Lantana (*Lantana camara*)

Distribution and abundance

Lantana is widely distributed east of the Great Dividing Range along the coastal strip from Ulladulla on the South Coast to Cooktown in northern Queensland. Isolated infestations have been reported in the Northern Territory, Western Australia and Victoria. In NTR it occurs in most reserves along the eastern fall country at altitudes below 750 m. Population densities are greatest in open forest or disturbed temperate

rainforest communities. Lower density lantana infestations occur on dry slopes adjoining open forest communities. Most infestations of lantana are the common pink type, apart from several small populations of pink-edged red lantana in Oxley Wild Rivers National Park.

Impacts

Lantana is listed as a Weed of National Significance due to its impact on primary industries, conservation and biodiversity. In natural ecosystems lantana infests forest edges and riparian areas, penetrates disturbed rainforest and invades open woodland. Its dense thickets exclude native species through smothering and allelopathic effects, dominate understoreys and reduce biodiversity. The thickets also increase the intensity of wildfire and provide harbour for pest animals such as feral pigs.

Further detail regarding lantana impacts can be found in the National Plan to Protect Environmental Assets from Lantana.

Lantana is a major threat to the dry rainforest remnants which are part of the Gondwana Rainforests of Australia and listed as a World Heritage Area. It is a declared noxious weed and listed as a KTP.

Priorities for control

The control of lantana is generally considered to be a high priority in NTR.

Priority will be given to the control of lantana where:

- it poses a threat to high conservation value areas such as the Gondwana dry rainforests
- it is impacting on riparian zones or reducing access to watercourses by native animals or park users
- it is a smaller isolated or new infestation that can potentially be removed completely
- it is impacting on public or management access along roads or trails.

To date a high priority has been given to areas of Oxley Wild Rivers NP, Washpool NP, Gibraltar Range NP, Nymboida NP, Guy Fawkes River NP and Georges Creek NR.

Control

An integrated approach is taken to the control of lantana in NTR. Foliar application of herbicide is used where there is access for spraying equipment and the size of the infestation makes this method viable. Hand-pulling has been used to remove small numbers of isolated plants.

Biological control agents will be released into larger infestations where other control techniques are impractical due to restrictions on access or the extent of the infestation. Three biocontrol agents have been released in the Region: a leaf-mining beetle, a stem-sucking bug and a rust.

Monitoring

Lantana infestations will be progressively mapped on all reserves within the Region. Annual control programs will also be mapped and the data entered into PWIS. This information will be used to monitor changes to the distribution and/or density of lantana within the Region and the effectiveness of control programs.

Mother-of-millions (*Bryophyllum* spp.)

Distribution and abundance

Mother-of-millions occurs in several reserves in the Armidale and Tenterfield areas. Minor infestations are present in Kwiambal NP, Goonoowigal SCA and Bingara SCA, while a more serious infestation occurs in Dthinna Dthinnawan NP.

Impacts

These plants have the capacity to spread quickly and to form dense colonies, especially in leaf litter or shallow soils in shady woodlands. Dense colonies exclude native flora species from establishing. Due to their drought tolerance and reproductive ability, this weed is very persistent and continues to reproduce in most conditions. This plant is toxic to stock.

Mother-of-millions is a declared noxious weed.

Priorities for control

- Frequent follow-up control is necessary to prevent this weed dispersing over a larger area within Kwiambal NP and Bingara SCA.
- Containment of the infestation in the Dthinna Dthinnawan NP and strategic control to prevent further spread is a priority.

Control

- Map distribution of infested areas.
- Limit access to infested areas to reduce further spread by vehicles or equipment.
- Use herbicide to control this weed where infestations are small.
- Small colonies can be pulled by hand. Plants which are hand-pulled must be carefully removed and destroyed or they can re-establish where they are left.
- Biological control (citrus thrip) or controlled burning followed by herbicide treatment should be used for large infestations.
- Burn treated infestations to reduce seedling growth.
- Monitoring and frequent follow-up control is necessary for a minimum of five years.
- Participate with neighbours and catchment management initiatives to reduce establishment of new infestations.

Monitoring

- Map annual control programs to confirm reduction in distribution and density.
- Establish photopoints to monitor re-infestation and effectiveness of long-term control.

Mysore thorn (*Caesalpinia decapetala*)

Distribution and abundance

Mysore thorn (also known as thorny poinciana) has limited distribution in NTR. It is found in Nymboida National Park and is located on private property close to the Guy

Fawkes River National Park. In Queensland this weed is listed as a major pest species, occurring in the Brisbane, Yeppoon and Toowoomba districts.

Impacts

This is a deciduous, sprawling noxious shrub with numerous spines, which forms impenetrable thickets limiting animal movement and smothering other plants. Its branches are covered with inward facing barbs which can ensnare native mammals and cattle. It can smother native flora species and invades forest communities in riparian areas. Heavy infestations along riverbanks are likely to affect stream flow.

Mysore thorn is a declared noxious weed in parts of NTR.

Priorities for control

- Nymboida National Park.
- Where infestations are limited or are a new incursion and effective control will prevent further distribution of the weed.
- Where infestations are likely to spread onto adjoining private property.

Control

- Map current infestations across NTR.
- Contain and reduce present infestations with strategic herbicide application.
- Monitor and frequently follow-up control for a minimum of five years.
- Participate with neighbours and catchment management initiatives to reduce establishment of new infestations on NPWS estate and neighbouring lands.

Monitoring

- Map annual control programs to confirm reduction in distribution and density.

Nodding thistle (*Carduus nutans*)

Distribution and abundance

Nodding thistle, a native of Europe, northern Africa and parts of Asia, is found in the higher rainfall tableland areas of NSW and in Victoria and Tasmania. In NTR it has been recorded in seven reserves: Mummel Gulf NP, Nowendoc NP, Mother of Ducks NR, Ngulin NR, Tuggolo Creek NR, Booroolong NR and Little Llangothlin NR. All infestations are limited to small isolated areas, mostly with low plant density, and have been subject to annual control programs.

Impacts

Nodding thistle is regarded as a serious environmental and agricultural weed. It grows in dense patches that reduces access and alters species composition. Nodding thistle produces allelopathic compounds that suppress other plants.

Priorities for control

As the distribution of nodding thistle is limited to very small areas in each reserve, a high priority will be given to the control of all infestations with the aim of preventing the weed becoming established.

Control

- Treat existing infestations with herbicide, chipping and/or hand-pulling where plants are in low numbers.
- Ensure control is completed prior to seed set each year.

Monitoring

- Monitor likely areas for new infestations.
- Continue to closely monitor known locations during the growing season and immediately treat any plants that are detected.
- Map all known infestations of nodding thistle and monitor annually to ensure there is no increase in distribution or density.

Osage orange (*Maclura pomifera*)

Distribution and abundance

This weed occurs in Kwiambal NP and Severn River NR.

It is found predominantly on the banks of the Severn and Macintyre rivers. It is more prevalent in Kwiambal NP, with the majority of the population being located on the Macintyre River. There are scattered trees on the Severn River. Seedling growth and spread of this weed appears to be limited.

Impacts

This tree grows to a height of 6–-8 m, and, due to its multi-stemmed nature, can form dense infestations if left uncontrolled. Due to its preference for growing in riparian areas, it can restrict access and eventually block small waterways. The semi-sprawling growth pattern of this tree reduces the ability of native vegetation to re-establish.

Priorities for control

- Macintyre River in Kwiambal NP.
- Follow-up control along the Severn River in Kwiambal NP.

Control

- Map distribution in affected areas.
- Control using herbicide application carried out in conjunction with neighbours.
- Encourage cooperative control with neighbours.

Monitoring

- Map annual control programs to confirm reduction in distribution and density (local eradication in riparian areas considered possible).

Prickly pear (*Opuntia* spp.)

Distribution and abundance

Common prickly pear (*O. inermis*), tiger pear (*O. aurantiaca*) and smooth tree pear (*O. monacantha*) are widespread on the northern slopes and tablelands in the Region. They occur in both eastern escarpment areas and western areas, but are

more common in western reserves where the drier climate and shallow soils suit establishment. Reserves around Bingara generally have a higher density of pear, particularly tiger and tree pear, than reserves in other parts of the Region.

Populations vary from scattered individual plants to large patches.

Impacts

Prickly pear became a Weed of National Significance in 2012. Prickly pear is regarded as a serious environmental and agricultural weed. Dense patches can form an impenetrable barrier to native animals, livestock and humans. It can also act as harbour for rabbits and other pests.

Prickly pear is a declared noxious weed.

Priorities for control

The control of prickly pear is generally considered to be of low to medium priority in NTR.

A higher priority will be given to the control of isolated new infestations to prevent prickly pear from becoming established in new locations.

Priority will also be given to the control of established infestations where there is a significant impact upon the conservation values of the reserve, threatened flora or fauna species, or where it is necessary for other identified management purposes.

Control

An integrated approach will be used to control prickly pear in NTR.

The biological control agents cactoblastis (*Cactoblastis cactorum*) and cochineal (*Dactylopious opuntiae)* will be the primary method for control of large established infestations of prickly pear. Where necessary, the manual transfer of segments of pear infected with the biocontrol agents will be used to assist spread to other infestations.

Tiger and tree pear in the Bingara and Gwydir River reserves will be controlled using herbicide to reduce overall density and distribution and prevent spread onto adjoining private lands.

Herbicide will be used to treat small isolated patches of common pear, where there is no evidence of biological control agents or there is an identified need for a more rapid removal.

Monitoring

Monitoring of prickly pear will be limited to observations by field staff of the density and distribution of the weed. The distribution and effectiveness of biocontrol agents will also be monitored.

Privet (*Ligustrum lucidum*)

Distribution and abundance

This weed is present in Kings Plains NP, Barool NP and Oxley Wild Rivers NP. In Kings Plains an infestation occurs along Kings Plains Creek on the northern boundary of the park, and continues into private property along the creek.

In Barool NP this weed occurs along the Mann River opposite Wytaliba. A minor, low density population also occurs in the Gara Gorge visitor area of Oxley Wild Rivers NP.

Impacts

This weed colonises gullies, creek banks, bushland and pasture, causing damage to native vegetation by forming dense infestations and outcompeting native vegetation. The dense colonies formed by this weed prevent any re-establishment by native species. Privet is suspected of being poisonous, and is known to cause hay fever. It is a declared noxious weed.

Priorities for control

- Kings Plains Creek (Kings Plains NP)
- Barool NP (Mann River)
- Gara Gorge visitor area, Oxley Wild Rivers NP.

Control

- Map all privet on NPWS estate on a regional basis.
- Treat with herbicide with either cut-stump or stem injection for mature trees, or foliar application for seedlings.
- Follow up treatment for a minimum of five years is necessary due to the large seed bank present.

Monitoring

- Map annual control programs to confirm reduction in distribution and density (local eradication considered possible).

Serrated tussock (*Nassella trichotoma*)

Distribution and abundance

Serrated tussock is a common weed on the Northern Tablelands and has established on many private properties. It has been recorded in two reserves in NTR: Imbota NR and Yina NR. Both infestations are very limited in area and are regularly monitored and controlled to prevent seed set. Serrated tussock has been identified on numerous private properties adjoining these and other reserves.

Impacts

Serrated tussock is a weed that dominates native pasture, seeds prolifically and is unpalatable to herbivores. It competes with native species and can impact on the conservation values of natural areas.

Serrated tussock is a declared noxious weed and a Weed of National Significance. New England Weeds Authority has an extensive and effective program operating to contain and eventually eradicate this weed in their LGA.

Priorities for control

A high priority will be given to preventing serrated tussock from becoming established in Imbota NR and Yina NR. The current very effective annual control program has limited the infestations to a small section of each reserve and reduced the density to a minimum number of plants germinating each year.

Control

- Control all serrated tussock plants with herbicide application, chipping or hand-pulling, prior to seed set.

- Inspect the area of the infestation regularly during the growing season to ensure early detection of any new germination.
- Inspect other NPWS estate for this weed, particularly in areas where adjoining private property has serrated tussock infestations.
- Undertake all control and monitoring in close cooperation with New England Weeds Authority.

Monitoring

- Map the current infestation in Imbota NR and Yina NR.
- Inspect regularly to monitor for any changes in distribution or density.
- Monitor other reserves that are under threat of invasion by serrated tussock from adjoining private properties.

St John's wort (*Hypericum perforatum*)

Distribution and abundance

The heaviest infestations of St John's wort in NSW are along the tablelands and slopes. In NTR it occurs in Barayamal NP, Bingara SCA, Nowendoc NP, Melville Range NR and Mother of Ducks Lagoon NR. It is also in close proximity and poses a threat to Kings Plains NP, Cottan-Bimbang NP and Mummel Gulf NP.

Impacts

St John's wort is a serious agricultural and environmental pest. It is a highly prolific seeder, which outcompetes native flora and is toxic to livestock.

The weed spreads by seed and by lateral roots. Seeds have a sticky coating and can adhere to native fauna or livestock and be dispersed long distances. Seeds can also be transported in the digestive tracts of animals.

St John's wort is a declared noxious weed.

Priorities for control

Effective control programs have reduced the infestation of St John's wort at Mother of Ducks Lagoon to a few plants. It will be a high priority to continue with this control work until the weed is eradicated from the reserve.

Priority will also be given to ongoing control programs in Nowendoc NP which have significantly reduced the distribution and density of this weed.

A very small infestation in Melville Range NR is currently being controlled as part of a CMA funded project targeting a much larger infestation on adjoining private lands. The infestation is in Box Gum Woodland EEC and is a priority under the BPWW program.

St John's wort is widespread on a number of properties adjoining Bingara SCA and Gwydir River NP but has not established in the reserves. Priority will be given to control of the limited number of isolated plants within the reserves.

Control

Foliar application of herbicide is the most effective control method. Follow-up control must be undertaken at least once, preferably twice, during the growing season.

Monitoring

- All infestations in and near NPWS estate will be mapped and monitored for changes in distribution and density.
- All known infestations will be monitored during the growing season and any plants that are detected will be immediately treated with herbicide to prevent seed set.
- Susceptible NPWS areas will be monitored for new infestations, particularly Bingara SCA, Kings Plains NP, Cottan-Bimbang NP and Mummel Gulf NP.

Tree of heaven (*Ailanthus altissima*)

Distribution and abundance

Tree of heaven occurs in several reserves in NTR. It is usually found in riparian areas, and is common along the Severn River in both Kwiambal NP and Severn River NR. It has also been recorded in Goonoowigal NR and Barayamal NR, Oxley Wild Rivers NP, Nowendoc NP, Melville Range NR, Gwydir River CCA and Arakoola NR.

Trees in the above areas occur in dispersed clumps and vary in age from seedlings to mature trees up to 3.5 m high.

Impacts

This weed has an aggressive nature, and can colonise areas rapidly by suckering. It is an important competitor for light and nutrients, and as the leaves contain allelopathic substances growth of competing plants is inhibited, therefore encouraging growth of monospecific stands. Direct contact with the plant can cause dermatitis.

Priorities for control

- Goonoowigal NR and Barayamal NR.
- Gwydir River CCA – follow-up to major control work commenced in 2009–10.
- Oxley Wild Rivers NP and Nowendoc NP.
- Initial control programs commenced in 1999 and annual follow-up control is necessary in Severn River NR, Arakoola NR and Kwiambal NP.

Control

- Treat existing infestations with appropriate herbicides.
- Follow-up treatment to be conducted for a minimum of five years as regrowth from suckers is persistent.

Monitoring

- Map distribution of known infestations on a Region-wide basis.
- Reduction in distribution and density as confirmed by mapping of annual control programs.

Tropical soda apple (*Solanum viarum*)

Distribution and abundance

This is a new weed identified in the Macleay catchment in 2010, from Georges Creek through to Kempsey. Distribution on reserves is limited to small sections of Georges Creek NR and Oxley Wild Rivers NP.

Impacts

Tropical soda apple is an aggressive prickly shrub that invades open and semi-shaded areas, including pastures, forests, riparian zones, roadsides, and recreational and agricultural areas. It reduces biodiversity by displacing native flora and disrupting ecological processes. It is unpalatable to livestock and the prickles restrict the movement of both native and domestic animals. The plant is a host for many diseases and pests of cultivated crops and it is poisonous to humans.

Priorities for control

As tropical soda apple is a new weed with very limited distribution on NPWS estate, control and eradication in both Oxley Wild Rivers NP and Georges Creek NR is a very high priority for the Region.

Control

Extensive control was commenced in 2010 when the weed was first identified with follow-up control in early 2011. Larger patches of the weed in the more accessible areas were controlled using foliar application of a woody weed herbicide. Smaller patches and isolated plants were grubbed or pulled, and fruit was collected and destroyed. All known occurrences of tropical soda apple have now been treated and control is focused on detecting and removing new germinations before they can set seed.

Monitoring

Regular monitoring for new germinations of tropical soda apple is a key part of the strategy for control and eradication of this weed. All locations where the weed has previously been mapped or it is likely to occur are inspected every month in Georges Creek NR and every three months in Oxley Wild Rivers NP.

Whisky grass (*Andropogon virginicus*)

Distribution and abundance

Whisky grass is a widespread weed on the Northern Slopes and Tablelands with infestations common along roadsides, railways, low fertility marginal lands and overgrazed native pastures. Infestations occur in numerous reserves in the Region, including Boonoo Boonoo, Oxley Wild Rivers NP, Kings Plains NP, Gibraltar Range NP and Bolivia Hill NR. Scattered infestations also occur in numerous other reserves.

Impacts

This perennial grass is unpalatable to native fauna species, and is an effective competitor with native grasses such as kangaroo grass and native sorghum, particularly after fire or droughts when native flora species are suppressed.

Infestations can become severe, particularly following major fires. Achieving effective control, particularly where large, scattered infestations exist, is difficult.

Seed is easily caught in animal fur which facilitates dispersal. In addition, machinery and vehicles contribute to the spread of this weed. This weed currently has no classification under the Noxious Weeds Act.

Priorities for control

- Areas where infestations are limited, such as Kings Plains NP, Gibraltar Range NP and Martins Flat in Boonoo Boonoo NP.
- Bolivia Hill NR.

Control

- Vehicle and machinery hygiene is essential to reduce the spread of this weed. Vehicles or machinery that travel through infested areas should be thoroughly washed down before moving to areas where this weed is not present.
- Established infestations are best treated with herbicide, preferably with wick application. Spot spraying is not selective and will remove all competition, resulting in quick re-invasion. Hand chipping can be used where infestations are small.
- Cooperative programs with neighbours and local councils should be encouraged to suppress and control this weed.

Monitoring

- Infestations will be mapped on a regional basis.
- Mapping of annual control programs will confirm reduction in distribution and density.
- Photopoints established to monitor re-infestation and effectiveness of long-term control.

Willows (*Salix* spp.)

Distribution and abundance

More than 100 species of willows have been deliberately introduced into this country for landscaping, nurseries or shade and shelter for livestock. At least a dozen of these species and their hybrids are now widespread in south-eastern Australia. They occur in varying densities along rivers, creeks and other watercourses in many reserves within NTR.

Impacts

Willows pose a major threat to riverine and freshwater wetland systems. Dense growth of seedlings and young trees can alter stream beds and channel flow, resulting in increased bank erosion. Mature trees produce large amounts of wind-dispersed seed annually.

Willows are a declared noxious weed throughout NSW and are listed as a Weed of National Significance.

Priorities for control

The control of willows is generally considered to be of low to medium priority in NTR, however a higher priority will be given where:

- they are a small isolated infestation likely to spread into new areas
- there is evidence of a detrimental impact on stream banks
- they impact on the conservation and/or recreational values of a reserve.

Control

Physical removal and herbicide application are the preferred method of control.

- Trees less than 0.5 m tall can usually be pulled out by hand.
- Machinery can be used to remove larger mature willows but is rarely justifiable and can cause damage to the stream bank.
- Chemical application methods such as foliar spraying for trees up to 2 m high, stem injection or cut stump for larger trees have been used successfully to control willows.

Monitoring

Monitoring will be limited to field observations to detect changes to the distribution or density of willows on the reserves.

Emerging pest species

Bell miner associated dieback

Distribution and abundance

Bell miner associated dieback (BMAD) is found in a number of eucalypt forest types between Victoria and southern Queensland. The current spatial distribution of BMAD throughout NSW is not known in detail. Significant areas of forests within NTR are at risk or have already been affected by BMAD. Areas of BMAD are known to occur in Oxley Wild Rivers NP, Nymboida NP, Barool NP, Gibraltar Range NP, Mummel Gulf NP and Cottan-Bimbang NP. It is suspected to be present in a number of other reserves along the eastern fall. There are areas of adjoining state forest and private forested lands in the Region that are vulnerable or affected.

Impacts

Forest eucalypt dieback associated with overabundant bell miners and psyllids has been determined as a KTP under the TSC Act. The condition is associated with the establishment of bell miner colonies and an overabundance of sap-sucking psyllid insects in the forest canopy. The persistence of psyllids in the canopy leads to dieback and eventual death of the affected trees. The impacts of BMAD include loss of biodiversity, and economic and recreational values. Forests affected by BMAD can become severely degraded with the loss of a significant proportion of overstorey species and in many cases subsequent invasion of the understorey by weeds, particularly lantana.

Avifauna are known to be affected by the presence of overabundant bell miners. A number of eucalypt species such as *Eucalyptus dunnii, E. saligna*, *E. grandis, E. siderophloia, E. acmenoides, E. punctata, E. paniculata*, are vulnerable to BMAD. EECs that are affected or potentially threatened by BMAD include Blue Gum High Forest of the Sydney Basin Bioregion, Blue Mountains Shale Cap Forest of the Sydney Basin Bioregion, White Gum Moist Forest of the North Coast Bioregion and Grey Box – Grey Gum Wet Sclerophyll Forest of the North Coast Bioregion. The

group of fauna at highest risk of BMAD are the eucalypt-dependent arboreal species and large forest owls. Koala, greater-squirrel, yellow-bellied glider and brush-tailed phascogale may all be at risk of decline due to poor forest health.

The risk and danger of tree and limb fall is also an issue in some areas affected by dieback and in some areas the visual and recreational qualities of known tourist sites are threatened by the loss of tree canopy and ecological integrity.

Priorities for control

Control priorities are currently limited to identifying the presence of BMAD and assessing the impact of BMAD at particular sites. Where the impact is significant, or could potentially become significant, site management plans will be prepared. Initial sites include Nymboida NP, Barool NP and Cottan-Bimbang NPs.

Control

Control of BMAD is a difficult challenge in the absence of empirical evidence to confirm its causes. Current operational activities to prevent spread and assist ecosystem recovery include weed control and fire management. The use of fire to manage lantana and manipulate bell miner habitat is the more useful tool available for mitigating BMAD impacts at present. Actions outlined in the Draft Statement of Intent for this KTP will be implemented by NPWS.

Monitoring

Monitoring of the location size of BMAD affected areas, and the outcomes of management actions on ecosystems, will continue and will be used to assist with adapting future management. Communities at risk of BMAD and new reports of BMAD will be assessed and mapped. The BMAD Working Group will provide advice and direction for future management.

Indian or common myna (*Acridotheres tristis*)

Distribution and abundance

The Indian or common myna is thought to have been introduced into Australia from south-east Asia in the 1860s. Since this introduction the species has spread by natural dispersal and by deliberate introductions from the original release sites of Melbourne and Sydney to most of coastal eastern Australia. In recent years it appears that populations of Indian mynas have increased and expanded their habitat from areas with close association to human habitation to include open pasture lands and open forest.

Indian mynas are not widely distributed throughout the Region, but information on their distribution and density in NTR needs to be collected. A small population of the birds has been recorded in Oxley Wild Rivers NP.

Impacts

The Indian myna is a very intelligent and aggressive bird that is known to evict native birds such as parrots, kookaburras and pee-wees from their nests, dump out their eggs, chase them away from their nests, and drive them away from the area. In urban habitats they are considered to be a threat to the long-term survival of native birds. Indian mynas are also suspected to contribute to the spread of certain weed species such as bitou bush.

Priorities for control

- NPWS will encourage local governments in the Region to undertake control programs to reduce the spread of the birds onto NPWS estate.
- NPWS will support community-based control programs.
- NPWS will develop effective control techniques to eradicate the Indian myna population in Oxley Wild Rivers NP.

Control

A trapping system developed at the Australian National University is being trialled by a number of community groups and local councils along coastal NSW. Trapping has been successful in cities such as Canberra in reducing localised populations of Indian mynas. Trapping may be used in the Region in the future.

Monitoring

NTR staff will actively record and maintain information on the locations of Indian myna populations within the Region and enter this information into a database such as the Wildlife Atlas.

Mexican waterlily (*Nymphaea Mexicana*)

Distribution and abundance

Mexican or yellow waterlily, native to North America and Mexico, is a hardy perennial aquatic weed with floating leaves that is able to spread easily within catchments. In NTR it occurs in the Gara River, in the vicinity of Gara Dam, upstream of Oxley Wild Rivers NP. Mexican waterlily is gradually moving downstream and has the potential to become established within the park.

Impacts

Once established, Mexican waterlily is extremely difficult to eradicate and eventually may form a large enough mass to block waterways. This would have significant impact on aquatic and other native species as well as aesthetic values of the park.

Priorities for control

Preventing Mexican waterlily from entering and becoming established in Oxley Wild Rivers NP is of the highest priority.

Control

Control will focus on working cooperatively with New England Weeds Authority to prevent further movement of Mexican waterlily downstream towards Oxley Wild Rivers NP. Currently the only effective control method appears to be physical removal of the weed. Field staff will be trained to identify this plant.

Monitoring

Regular monitoring of the Gara River from the current known location of Mexican waterlily downstream to the park boundary and beyond will be undertaken by staff in conjunction with New England Weeds Authority.

Plant pathogens of significance

Phytophthora (*Phytophthora cinnamomi*)

Distribution and abundance

Phytophthora has been identified in Gibraltar Range NP, Werrikimbe NP, Mummel Gulf NP and Oxley Wild Rivers NP.

Impacts

Phytophthora is a soil-borne pathogen belonging to the water mould group. It spreads by the movement of spores through water or transmission from infested plant roots. It can also be distributed by machinery or animals. Phytophthora infects a large number of species, however they display varying effects – some are killed, others are damaged or show no apparent symptoms. In excess of 30 threatened or ROTAP species are potentially impacted by the pathogen in NTR.

Infection of native plants by *Phytophthora cinnamomi* has been listed as a key threatening process in Schedule 3 of the TSC Act and dieback caused by the root-rot fungus (*Phytophthora cinnamomi*) as a Key Threatening Process under the EPBC Act.

Management objectives

Prevent the spread of Phytophthora from current known locations to non-infected areas.

Control priorities

Implementation of a containment strategy for NTR will increase public awareness and understanding, and reduce public access to infected catchments. Washing down of all NPWS vehicles is the standard operating procedure for vehicles exiting areas of known Phytophthora occurrence.

Control techniques

- Containment through the use of quarantine areas, signage and hygiene facilities.
- Protection of key areas through signage and hygiene facilities prior to entry.
- Possible treatment of key individual plants.

Monitoring

- Soil sampling in areas adjoining containment boundaries to monitor any movement.
- Monitoring of vegetation to in key locations to determine impacts on vegetation and key species.

Appendix 1 New pest species

Any suspected new pest species in the Region should first be reported to the regional pest management officer, who will then decide if it is necessary to alert the following groups.

Species	Contact	Website
All species	Report sightings to Wildlife Atlas	http://www.environment.nsw.gov.au/wildlifeatlas/about.htm#contribute
All species	Regional Invasive Species Officer (DPI) (see website for contacts)	http://www.dpi.nsw.gov.au/__data/assets/pdf_file/0004/345280/RWACs-ISO-contacts-map.pdf
Animal diseases	Emergency Animal Disease Hotline (DPI) - Report unusual disease signs, abnormal behaviour or unexplained deaths in livestock. Ph. 1800 675 888	http://www.dpi.nsw.gov.au/biosecurity/animal
Aquatic pests	Aquatic Pest Hotline (DPI) - Report suspected aquatic pests or weeds. Ph. 02 4916 3877	http://www.dpi.nsw.gov.au/biosecurity/aquatic
Insects and plant pests/ diseases[#]	Exotic Plant Pest Hotline (DPI) - Report suspect exotic and emergency insects and plant pests/diseases. Ph. 1800 084 881	http://www.dpi.nsw.gov.au/biosecurity/plant
Pest animals	Website - Form available for the reporting of new incursions of pest animals.	http://www.dpi.nsw.gov.au/agriculture/pests-weeds/vertebrate-pests/other-vertebrate-pests2/pest-reporting/pest-reporting-form
Weeds[**]	Notify relevant Local Control Authority and Weeds Hotline (DPI) Ph. 1800 680 244 Email - weeds@dpi.nsw.gov.au.	http://www.dpi.nsw.gov.au/agriculture/pests-weeds/weeds/contacts

[#] Certain diseases and pests are notifiable for the purposes of the *Plant Diseases Act 1924*. For example, red imported fire ant has been made notifiable under this Act. This means that you have a legal obligation to report suspected red fire ant infestations as soon as possible.

[**] Noxious Weeds in Control Classes 1, 2 and 5 are notifiable weeds under the *Noxious Weeds Act 1993.* This means that you must notify the local control authority within 3 days of becoming aware that the notifiable weed is on the land.

Appendix 2 Identified key threatening processes

The Region is very biodiverse and contains many threatened species and endangered ecological communities. There are many threats to these species and communities some of which have been identified at the federal and state level as KTPs. The pest management-related processes that are currently evident in the NTR are listed below.

Key threatening process	Type	State	National
Invasion and establishment of exotic vines and scramblers	Weed	●	
Invasion of native plant communities by exotic perennial grasses	Weed	●	
Invasion, establishment and spread of *Lantana camara*	Weed	●	
Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants	Weed	●	●
Competition and grazing by the European rabbit (*Orychtolagus cuniculus*)	Pest animal	●	●
Competition and habitat degradation by feral goats (*Capra hircus*)	Pest animal	●	●
Competition from feral honeybees (*Apis mellifera*)	Pest animal	●	
Herbivory and environmental degradation caused by feral deer	Pest animal	●	
Introduction of the large earth bumblebee (*Bombus terrestris*)	Pest animal	●	
Predation by feral cats (*Felis catus*)	Pest animal	●	●
Predation by the European red fox (*Vulpes vulpes*)	Pest animal	●	●
Predation, habitat degradation, competition and disease transmission by feral pigs (*Sus scrofa*)	Pest animal	●	●
Ecological consequences of high frequency fires	Habitat loss/change	●	
Forest eucalypt dieback associated with over-abundant psyllids and bell miners	Habitat loss/change	●	
Loss and/or degradation of sites used for hill-topping by butterflies	Habitat loss/change	●	
Infection of frogs by amphibian chytrid fungus causing the disease chytridiomycosis	Disease	●	●
Infection of native plants by *Phytophthora cinnamomi*	Disease	●	●
Introduction and establishment of exotic rust fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae	Pathogen	●	