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

Regional Pest Management Strategy 2012–17: South Coast 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.

For further information contact:

South Coast Region
Coastal Branch
National Parks and Wildlife Service
Office of Environment and Heritage
Department of Premier and Cabinet
55 Graham Street
Nowra NSW 2541
Telephone: 02 44 232170

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Office of Environment and Heritage
59–61 Goulburn Street, Sydney, NSW 2000
PO Box A290, Sydney South, NSW 1232
Phone: (02) 9995 5000 (switchboard)
Phone: 131 555 (environment information and publications requests)
Phone: 1300 361 967 (national parks, climate change and energy efficiency information and publications requests)
Fax: (02) 9995 5999
TTY: (02) 9211 4723
Email: info@environment.nsw.gov.au
Website: www.environment.nsw.gov.au

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Cover photos, main: bitou bush infesting Tollgate Islands Nature Reserve (OEH); small: wild dog captured by remote camera; feral cat; feral goat with a GPS collar being held before moving (M McGaw); helicopter moving the goat to a remote area (G Eccles/OEH).

Summary

The NPWS regional pest management strategies aim to minimise adverse impacts of pests on biodiversity, protected areas and the community. The strategies achieve this through identifying and focusing on the highest priority programs, ensuring that actions are achievable and deliver measurable outcomes.

This regional pest management strategy describes the local circumstances in South Coast Region. The Region undertakes a variety of pest management programs in order to protect the reserves that it manages. Important aspects of this control are not only for the protection of biodiversity, flora and fauna but also include the protection of off-park assets, such as surrounding agricultural enterprises and recreational values.

Some of the highest priorities for the Region will be effective and coordinated management of wild dogs, control of expanding pest species and Class 1 and 2 noxious weeds, pest management to protect threatened species, and improving on existing programs.

Continuation of the work that allows threatened species such as the brush-tailed rock-wallaby and threatened shorebirds to persist has overwhelming support and cooperation from the community.

Within South Coast Region there are a number of wild dog management plans that take a nil tenure approach so that management is not limited by property boundaries. In recent times there has been an increase in an effective cooperative approach that has led to positive outcomes. Over the life of this regional pest management strategy, further refining of this approach will be undertaken to ensure the preservation of the dingo in Schedule 2 areas while effectively and efficiently controlling the impacts of wild dogs on adjacent rural properties.

There are numerous additional pest species programs undertaken by NPWS throughout the South Coast Region. The main priority in relation to these programs will be the adoption of adaptive management approaches that are cooperative, effective and efficient.

Major programs include the:

- shorebird management and recovery program
- brush-tailed rock-wallaby management program
- aerial goat control program.

Contents

Abbreviations

AA	Aboriginal Area
APZ	Asset Protection Zone
BPWW	Biodiversity Priorities for Widespread Weeds (BPWW CC1-6 refers to control categories within BPWW Statewide Framework[1])
BTRW	Brush-tailed rock-wallaby
CAP	Catchment Action Plan
CMA	Catchment Management Authority
DECCW	NSW Department of Environment, Climate Change and Water
EEC	Endangered Ecological Community
ESFM	Ecologically Sustainable Forest Management
LGA	Local Government Area
LHPA	Livestock Health and Pest Authority
KPI	Key Performance Indicator
KTP	key threatening process
MER	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
OEH	Office of Environment and Heritage
OSCU	Operations and Support Coordination Unit
PAS	Priorities Action Statement
PMP	Park Management Program
POM	Plan of Management
PWG	Parks and Wildlife Group, the internal name within OEH for NPWS
RLP Act	*Rural Lands Protection Act 1998*
ROP	Regional Operations Plan
ROTAP	Rare or Threatened Australian Plants
RP	Regional Park
SCA	State Conservation Area
SCSRP	South Coast Shorebird Recovery Program
SFAZ	Strategic Fire Advantage Zone
SOP	Standard Operating Procedure
TAP	Threat Abatement Plan
TSC Act	*Threatened Species Conservation Act 1995*

[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 South Coast 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

South Coast Region covers 1.36 million hectares, extending from Stanwell Park in the north to Batemans Bay in the south, and west of Goulburn along the tablelands. The Region broadly covers three distinct geographic areas - the tablelands and the coastal plain, separated by the great eastern escarpment.

Regional context

South Coast Region's varied landscapes and altitude range are reflected in its high biodiversity. Vegetation communities comprise all the major types of rainforest in NSW (subtropical, warm temperate, cool temperate, littoral and dry), numerous different eucalypt communities of tall open forest, forest and woodland, coastal and upland heath and freshwater and estuarine wetland. A large number of threatened plant and animal species occur including several endemic plant species. South Coast Region is of major conservation importance for several threatened fauna species including the ground parrot, eastern bristlebird, glossy black-cockatoo, tiger quoll, brush-tailed rock wallaby, green and golden bell frog and broad-headed snake.

South Coast Region coincides with 11 local government areas: Shellharbour, Kiama, Shoalhaven, and parts of Wollongong, Campbelltown, Wollondilly, Wingecarribee, Goulburn Mulwaree, Palerang, Upper Lachlan and Eurobodalla, and overlaps with three Livestock Health and Pest Authority districts: Tablelands, Cumberland and South East. Jervis Bay National Park shares a border with the Commonwealth managed Booderee National Park.

Park management

The Region is divided into four management Areas: Illawarra, Ulladulla, Nowra and Highlands. In these management Areas there is approximately 346,000 hectares in 61 protected areas, including 16 national parks, 34 nature reserves, seven state conservation areas, two regional parks and two Aboriginal areas.

The Areas are primarily responsible for implementation of works and activities within their geographical areas. The Operations and Support Coordination Unit (OSCU) provides professional support to the Areas and coordinates Region-wide functions and responsibilities, including the strategic planning and coordination of pest management.

OEH and Sydney Catchment Authority jointly sponsor the management of a number of Special Areas through the Special Areas Strategic Plan of Management (SASPOM) to provide high quality water in reservoirs by protecting the ecological integrity and natural and cultural values of the Special Areas. Pest species management within the Special Areas aims to protect and optimise water quality entering the storages and conserve ecosystem integrity, natural and cultural values, by reducing and minimising the impact of pest species on water quality and addressing the critical threats to ecological integrity and conservation values. Sydney Catchment Authority is both a major adjacent landholder and key stakeholder with similar values in environment protection. Under the joint management arrangements for the Special Areas, the Executive Steering Group and the Special Areas Operations Group provide opportunities for OEH and Sydney Catchment Authority to discuss, coordinate and cooperatively implement pest species management programs across land tenures within the Special Areas.

Community engagement

There is an extensive reserve interface with numerous villages, towns and cities such as Wollongong, Wedderburn, Bomaderry/Nowra, Bundanoon, Jervis Bay, Cudmirrah/ Berrara, Burrill Lake, Lake Tabourie, Merry Beach, Depot Beach, Durras, Maloneys Beach and Surfside. Adjacent land uses include residential, industrial, agricultural, forestry and recreational uses. These various interfaces influence weed and pest animal occurrence as well as control methods.

As a result, community engagement is a high priority for South Coast Region. Examples of this are working with landholders in three wild dog management plan areas, and working with volunteers to protect shorebirds and BTRW. Further examples of community groups that South Coast Region supports in protecting and enhancing the natural environment include, but are not limited to, Robertson Environment Protection Society, Upper Minnamurra Rivercare Group, Friends of Durras and Conservation Volunteers Australia.

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

Pest issues in the rural interfaces are primarily associated with vertebrate pests. Many of these areas contain management challenges between preserving the dingo as a species on Schedule 2 lands and controlling wild dogs to protect adjacent agricultural enterprises. As a result, South Coast Region is committed to coordinated cooperative approaches with stakeholders outlined in the three wild dog management plans of which South Coast Region is a stakeholder and signatory.

The implementation of the NSW Fox TAP has led to programs to protect threatened and endangered species such as the BTRW and shore birds such as the little tern, hooded plover, sooty oystercatcher and the pied oystercatcher. These programs include monitoring of the species at risk and the pests that threaten their existence. Often, control techniques take an active adaptive management approach to utilise the most effective control techniques suited to that particular time and location.

An emerging critical priority for South Coast Region is the expanding populations and new incursions of deer species into reserves and bushland on other land tenures within the region. Many of these deer are not only impacting on the rural interface but also encroaching on the urban interfaces. Future monitoring and innovative, coordinated control techniques will be essential to control these pests.

In recent years, South Coast Region has supported and worked collaboratively with other agencies to trial and undertake new control technologies in order to better control pests. These include Tarlo River National Park being one of the trial sites that aided M44 ejectors being registered for use in national parks. The M44 ejector is an additional tool that has been extremely effective in reducing fox numbers. Furthermore, the satellite tracking of goats that has been undertaken since around

2009 has aided in controlling their numbers. Information gathered will also be used to map pest impacts on different vegetation types.

Currently, South Coast Region has many active weed programs and utilises a number of techniques, such as ground spraying, aerial spraying, and biological control and bush regeneration techniques. There are two containment lines to help stop the spread of particular weeds. The national containment zone for lantana is located at Ulladulla and the national southern containment line for bitou bush is just south of Sussex Inlet.

The management priorities for South Coast Region in relation to pests align with state and local priorities under the Noxious Weeds Act 1993 and the Rural Lands Protection Act 1998. In relation to pests, South Coast Region is committed to using best practice control and monitoring techniques. Additionally, South Coast Region is committed to undertaking and assisting in research and programs that enable more effective and humane control of pest animals.

South Coast Region has a strong pest focus and, as a result, undertakes many programs that are worthy of being identified as regional achievements. The following programs are a sample of the regional achievements in relations to pest animals.

Shore bird management and recovery programs

The South Coast Shorebird Recovery Program (SCSRP) began in 1999 to monitor and protect threatened shorebirds: the hooded plover (critically endangered), little tern (endangered), pied oystercatcher (endangered) and sooty oystercatcher (vulnerable). The program aims to recover these species by improving breeding success through management of threats to nests and chicks. The first three species nest on beaches, around lakes and rivers on the mainland, while the last species nests on rocky offshore islands.

As part of the SCSRP and the Fox TAP, fox control is undertaken around shorebird breeding sites to protect nests and chicks from fox predation. Existing pest control programs are supplemented with the activation of extra fox bait stations close to shorebird nesting sites before and during the shorebird breeding season. Baiting programs have been effective in lowering the density of foxes and sometimes completely removing foxes for a short critical period around nesting areas, and consequently have improved shorebird breeding success. However, it takes only one fox to decimate an entire little tern breeding colony of up to 100 breeding pairs, predating the majority of eggs and chicks in a single night.

Baiting programs are supplemented with reactive soft jaw trapping and night shooting when necessary. Fox den detection with trained dogs and subsequent den fumigation is also being trialled. This combination of fox control methods, including monitoring, appears to be effective in improving shorebird breeding success. The little tern population in NSW has recovered from 110 breeding pairs in the mid-1980s to around 500 breeding pairs. The hooded plover in South Coast Region is also experiencing a slight recovery in its population.

An emerging threat to the shorebirds of the south coast is raven predation. Ravens are intelligent birds which have learned to associate protective nesting area fences with a food source (eggs or chicks) and are currently the biggest threat to the recovery of shorebirds on the south coast. The Lake Wollumboola little tern colony was decimated by ravens in 2009–10 and the terns have not nested at the site since. Ravens also harass hooded plovers and pied oystercatchers and have become serial predators, resulting in extremely low breeding success at certain sites. Alternative raven control methods need to be researched and implemented.

Community support for the SCSRP is increasing with frequent media coverage and presentations raising awareness. There are more than 70 active SCSRP volunteers registered with NPWS in South Coast Region. Some of their contributions include monitoring and protecting shorebird nests and identifying fox and raven tracks so that reactive control can be undertaken.

Brush-tailed rock-wallaby management program

The BTRW is listed as an endangered species in NSW under the TSC Act. BTRWs in the Shoalhaven region are at the southern extent of the species range with the exception of approximately 20 individuals remaining in the wild in Victoria. In 2007 it was estimated that only 30 BTRW remained in the Shoalhaven region. In order to protect the local population, intensive 1080 fox baiting began in the Kangaroo Valley area in 1995, with baiting conducted by NPWS staff and numerous private property owners. In addition, a number of local landholders formed the Friends of the BTRW to assist NPWS in raising the species profile as well as raising funds to assist species management.

At present NPWS baits on NPWS estate, vacant crown land, Sydney Catchment Authority estate, Shoalhaven City Council estate, Nowra Local Aboriginal Land Council estate and approximately 15 private properties. A range of control techniques is being implemented to ensure adaptive management of the local fox population: ongoing 1080 baiting using a variety of bait matrices, use of M44 ejectors, fox shooting, trapping and den identification using fox scent detection dogs. In 2011 over 50 private properties were participating in the NPWS fox shooting program.

Due to the significantly low numbers of BTRW it became apparent that, despite the extensive fox control efforts, it would only take a few foxes to stop any recruitment of BTRW young into the adult population. To date 13 BTRW have been released into local colonies (as part of the NSW BTRW captive breeding program) in order to bolster numbers to levels where they could better withstand low levels of fox predation. Further releases are planned. While the species recovery has been slow, successful recruitment of young into the adult population is occurring at a number of local colonies. Since 2011, there has been an approximately 75% successful recruitment of young into the adult population.

Aerial goat control program

Since 1984, aerial goat control has been used in the Shoalhaven Gorge and surrounding areas with a total of 7019 goats culled. In addition, 1780 goats have been culled in Tarlo River National Park and surrounding areas.

Aerial pest control is a South Coast Region program undertaken in the Shoalhaven Gorge area of Morton National Park, Bungonia State Conservation Area, Bungonia National Park, in Bees Nest, Jerralong and Kerrawary Creek nature reserves and Tarlo River National Park, as well as on surrounding private property where landowner consent has been obtained.

When undertaking goat control in South Coast Region, management strategies include satellite tracking and use of Judas goats, a methodology to monitor and evaluate the impact of the program on native flora and fauna in the reserves and consideration of animal welfare issues.

The program includes a component of ground-based shooting to recover collared goats and reduce numbers where aerial culling is not viable. In cooperation with the Sydney Catchment Authority, these operations include areas of Morton National Park along Shoalhaven Gorge west of Tallowa Dam to Fossickers Flat. Monitoring in this corridor identifies populations of goats; however, the vegetation types significantly

hamper the efficiency of aerial culling. Reducing the number of goats by ground culling in this area will reduce repopulation rates in the reserve.

The program is conducted using NPWS helicopters and pilots along with NPWS and LHPA personnel who are trained and accredited navigators and feral animal aerial shooting team (FAAST) shooters.

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). For example, undertake fox control at Kangaroo Valley priority sites for BTRW as identified in the Fox TAP.

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. For example, programs to control several species of deer that have been discovered in only some areas.

High priority

H-IH (International Heritage)

Programs that target pests that impact significantly on world heritage or international heritage values, for example control of foxes at migratory shorebird nesting sites such as at Lake Wollumboola.

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, or 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 blackberries in the Ettrema 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, or 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 bitou bush 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

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

Area	Reserve(s)	Site name	Target pests or weeds	Asset at risk	Aim of control	Action	Priority
Highlands	Budderoo NP	2389 – greater Rainforest precinct	*Ageratina adenophora, Ageratina riparia, Anredera cordifolia, Araujia sericifera, Delairea odorata, Erythrina sykesii, Ipomoea spp., Lantana camara, Ligustrum sinense, Pennisetum clandestinum, Tradescantia fluminensis*	Sub-tropical, Coachwood and Featherwood Cool and Warm Temperate Rainforest EECs (TSC-e), *Irenepharsus trypherus* (TSC-e, EPBC-e) (BPWW – CC1)	Asset protection	Hand weeding, cut and paint and spray	C-TSC
Highlands	Morton NP	Shoalhaven River and tributaries	Chital deer	Illawarra Subtropical Rainforest EEC	Asset protection	Research and monitoring	C-TSC
Highlands	Barren Grounds NR	Barren Grounds NR	Feral cats	Long-nosed potoroo, eastern bristlebird, ground parrot	Asset protection	Monitoring and trapping	C-TSC
Highlands	Budderoo NP	Budderoo NP	Feral cats	Long-nosed potoroo, eastern bristlebird, ground parrot	Asset protection	Monitoring and trapping	C-TSC
Highlands	Kangaroo River NR, Cambewarra Range NR, Morton NP, Bugong NP	Kangaroo Valley	Feral goats	Brush-tailed rock-wallaby	Asset protection	Monitoring, trapping and ground shooting	C-TSC
Highlands	Morton NP	Shoalhaven River and tributaries	Feral goats and feral pigs	Illawarra Subtropical Rainforest EEC	Asset protection	Aerial shooting and ground shooting	C-TSC
Highlands	Barren Grounds NR and Budderoo NP	Barren Grounds Fox TAP site	Foxes	Long-nosed potoroo	Asset protection	Ground baiting, monitoring and trapping	C-TSC

Area	Reserve(s)	Site name	Target pests or weeds	Asset at risk	Aim of control	Action	Priority
Highlands	Kangaroo River NR, Cambewarra Range NR, Morton NP, Bugong NP	Kangaroo Valley Fox TAP site	Foxes	Brush-tailed rock-wallaby	Asset protection	Ground baiting, monitoring, trapping, ground shooting	C-TSC
Highlands	Cambewarra Range NR	2536 - Red Rock section	*Lantana camara*	*Solanum celatum* (TSC-e); Illawarra Subtropical Rainforest EEC (TSC-e); *Irenepharsus trypherus* (TSC-e, EPBC-e) (BPWW – CC2)	Asset protection	Hand removal, spray, cut and paint	C-TSC
Highlands	Budderoo NP	2462 - Irenepharsus site on escarpment of upper Kangaroo River	*Lantana camara, Delairea odorata, Ageratina riparia*	*Irenepharsus trypherus* (EPBC-e; TSC-e) (BPWW – CC1)	Asset protection	Hand removal, cut and paint	C-TSC
Highlands	Budderoo NP	2491 - Minnamurra Rainforest	*Lantana camara, Tradescantia fluminensis, Ageratina adenophora, Ageratina riparia, Acetosa sagittata, Delairea odorata*	Illawarra Subtropical Rainforest EEC (TSC-e), *Cynanchum elegans* (EPBC-e; TSC-e), *Daphnandra* sp. "Illawarra" (EPBC-e; TSC-e), *Irenepharsus trypherus* (EPBC-e; TSC-e), *Zieria granulata* (EPBC-e; TSC-e) (BPWW – CC1)	Asset protection	Hand removal, cut and paint	C-TSC
Highlands	Morton NP	2477 – Kimberley Park and Lake Yarrunga foreshore	*Ligustrum sinense,Lantana camara, Acetosa sagittata, Tradescantia fluminensis, Araujia sericifera, Ageratina riparia*	*Irenepharsus trypherus* (EPBC-e; TSC-e) (BPWW – CC2)	Asset protection	Hand weeding, spray, cut and paint	C-TSC
Highlands	Morton NP	2647 - Gales Flat	*Ligustrum sinense,Lantana camara, Acetosa sagittata, Tradescantia fluminensis, Araujia sericifera, Ageratina riparia*	*Irenepharsus trypherus* (EPBC-e; TSC-e) (BPWW – CC*)	Asset protection	Hand weeding, spray, cut and paint	C-TSC
Highlands	Morton NP	2648 - Griffins Farm	*Ligustrum sinense,Lantana camara, Acetosa sagittata, Tradescantia fluminensis, Araujia sericifera, Ageratina riparia*	*Irenepharsus trypherus* (EPBC-e; TSC-e) (BPWW – CC*)	Asset protection	Hand weeding, spray, cut and paint	C-TSC

Area	Reserve(s)	Site name	Target pests or weeds	Asset at risk	Aim of control	Action	Priority
Highlands	Robertson NR	2541 - Robertson NR	*Ligustrum spp., Rubus fruticosus, Tradescantia fluminensis, Ilex aquifolium, Pinus radiata*	Robertson Rainforest EEC (TSC-e) (BPWW – CC2)	Asset protection	Cut and paint, manual removal and revegetation	C-TSC
Highlands	Morton NP (north and west)	2576 - Western Part	*Nassella trichotoma*	Box Gum Woodland EEC (EPBC-ce; TSC-e) (BPWW – CC2)	Asset protection	Spray	C-TSC
Highlands	Nadgigomar NR	2558 - Sunset Mountain section	*Nassella trichotoma*	Box Gum Woodland EEC (EPBC-ce; TSC-e) (BPWW – CC2)	Asset protection	Spray	C-TSC
Highlands	Bangadilly NP	2649 - Bangadilly Box gum woodland	*Nassella trichotoma, Echium plantagineum*	White Box, Yellow Box, Blakely's Red Gum Woodland EEC (BPWW – CC*)	Asset protection	Spray	C-TSC
Highlands	Nadgigomar NR	2434 - East Nadgigomar section	*Pinus radiata*	Mature forest and woodland top ash dry shrub forest (regionally significant) (BPWW – CC2)	Asset protection	Cut and paint	C-TSC
Illawarra	Macquarie Pass NP	2410 - Clover Hill Precinct	*Ageratina adenophora, Ageratina riparia, Anredera cordifolia, Araujia sericifera, Delairea odorata, Erythrina sykesii, Ipomoea spp., Lantana camara, Ligustrum sinense, Pennisetum clandestinum, Tradescantia fluminensis*	Illawarra Subtropical Rainforest EEC (TSC-e) (BPWW – CC1)	Asset protection	Hand removal, spray, cut and paint	C-TSC
Illawarra	Dharawal NR, Illawarra Escarpment SCA	2652 - Maddens Plains	*Cortaderia selloana*	EEC - O'Hares Creek Shale Forest; Upland Swamps; EEC - Southern Sydney Sheltered Forest on Transitional Sandstone Soils in the Sydney Basin Bioregion (BPWW – CC*)	Asset protection	Ground spraying	C-TSC
Illawarra	Dharawal NP	Urban interface and utility corridors	Feral cats	Eastern bristlebird, eastern pygmy possum, ground dwelling birds, mammals, reptiles and amphibians	Asset protection	Trapping	C-TSC

Area	Reserve(s)	Site name	Target pests or weeds	Asset at risk	Aim of control	Action	Priority
Illawarra	Illawarra Escarpment State Conservation Area	Urban interface	Feral cats	Eastern bristlebird, eastern pygmy possum, ground dwelling birds, mammals, reptiles and amphibians	Asset protection	Trapping	C-TSC
Illawarra	Illawarra Escarpment State Conservation Area	Utility corridors	Feral cats	Eastern bristlebird, eastern pygmy possum, ground dwelling birds, mammals, reptiles and amphibians	Asset protection	Trapping	C-TSC
Illawarra	Dharawal NP	Boundaries	Feral goats	EECs: Shale/Sandstone Transition Forest, Southern Highlands Shale Woodland, Robertson Basalt Tall Open Forest, Robertson Rainforest, O'Hares Creek Shale Forest, Montane Peatland and Swamp, Cumberland Plain Woodland. Endangered: *Callitris endlicheri.* Aboriginal shelters	Asset protection	Ground and aerial shooting	C-TSC
Illawarra	Dharawal NR	Boundaries	Feral goats	EECs: Shale/Sandstone Transition Forest, Southern Highlands Shale Woodland, Robertson Basalt Tall Open Forest, Robertson Rainforest, O'Hares Creek Shale Forest, Montane Peatland and Swamp, Cumberland Plain Woodland. Endangered: *Callitris endlicheri.* Aboriginal shelters	Asset protection	Ground and aerial shooting	C-TSC

Area	Reserve(s)	Site name	Target pests or weeds	Asset at risk	Aim of control	Action	Priority
Illawarra	Illawarra Escarpment State Conservation Area	Mt Kembla; Maddens Plains	Feral goats	Southern Sydney Sheltered Forest on Transitional Sandstone Soils in the Sydney Basin Bioregion, Illawarra Sub-tropical Rainforest, Illawarra Coastal Grassy Woodland. Endangered: *Arthropteris palisotii, Cynanchum elegans, Daphnandra sp. Illawarra, Zieria granulate, Pomaderris adnata, Irenepharsus trypherus.* Vulnerable: *Syzygium paniculatum*, *Pultenaea aristata*, *Haloragis exalata subsp. Exalata var. exalata*. Regenerating forest.	Asset protection	Ground shooting	C-TSC
Illawarra	Upper Nepean State Conservation Area	Boundaries	Feral goats	EECs: Shale/Sandstone Transition Forest, Southern Highlands Shale Woodland, Robertson Basalt Tall Open Forest, Robertson Rainforest, O'Hares Creek Shale Forest, Montane Peatland and Swamp, Cumberland Plain Woodland. Endangered: *Callitris endlicheri.* Aboriginal shelters	Asset protection	Ground and aerial shooting	C-TSC
Illawarra	Macquarie Pass NP	2463 - Irenepharsus site on roadside	*Lantana camara, Ageratina adenophora, Aeratina riparia, Alairea odorata*	*Irenepharsus trypherus* (EPBC-e; TSC-e) (BPWW – CC2)	Asset protection	Hand removal, cut and paint	C-TSC

Area	Reserve(s)	Site name	Target pests or weeds	Asset at risk	Aim of control	Action	Priority
Illawarra	Illawarra Escarpment State Conservation Area	2498 - Mt Kembla portion, below railway line at Farmborough Hts	*Lantana camara, Ageratina adenphora, Ageratina riparia, Ipomoea spp., Araujia sericifera, Passiflora spp*	Southern Sydney Sheltered Forest on Transitional Sandstone Soils in the Sydney Basin Bioregion, Illawarra Sub-tropical Rainforest, Illawarra Coastal Grassy Woodland. Endangered: *Arthropteris palisotii, Cynanchum elegans, Daphnandra sp. Illawarra, Zieria granulate, Pomaderris adnata, Irenepharsus trypherus.* Vulnerable: *Syzygium paniculatum*, *Pultenaea aristata*, *Haloragis exalata subsp. Exalata var. exalata*. Regenerating forest (BPWW – CC1)	Asset protection	Ground spraying and bush regeneration	C-TSC
Illawarra	Illawarra Escarpment State Conservation Area	2496 - Mt Keira portion at Keiraville	*Lantana camara, Ageratina adenphora, Ageratina riparia, Ipomoea spp., Araujia sericifera, Passiflora spp.*	Southern Sydney Sheltered Forest on Transitional Sandstone Soils in the Sydney Basin Bioregion, Illawarra Sub-tropical Rainforest, Illawarra Coastal Grassy Woodland. Endangered: *Arthropteris palisotii, Cynanchum elegans, Daphnandra sp. Illawarra, Zieria granulate, Pomaderris adnata, Irenepharsus trypherus.* Vulnerable: *Syzygium paniculatum*, *Pultenaea aristata*, *Haloragis exalata subsp. Exalata var. exalata*. Regenerating forest (BPWW – CC1)	Asset protection	Ground spraying and bush regeneration	C-TSC

Area	Reserve(s)	Site name	Target pests or weeds	Asset at risk	Aim of control	Action	Priority
Illawarra	Illawarra Escarpment State Conservation Area	2497 - Mt Kembla portion, adjacent to O'Briens Road	*Lantana camara, Ageratina adenphora, Ageratina riparia, Ipomoea spp., Araujia sericifera, Passiflora spp.*	Southern Sydney Sheltered Forest on Transitional Sandstone Soils in the Sydney Basin Bioregion, Illawarra Sub-tropical Rainforest, Illawarra Coastal Grassy Woodland. Endangered: *Arthropteris palisotii, Cynanchum elegans, Daphnandra sp. Illawarra, Zieria granulate, Pomaderris adnata, Irenepharsus trypherus.* Vulnerable: *Syzygium paniculatum*, *Pultenaea aristata*, *Haloragis exalata subsp. Exalata var. exalata*. Regenerating forest (BPWW – CC1	Asset protection	Ground spraying and bush regeneration	C-TSC
Illawarra	Berkeley NR	2377 - Gooseberry Island	*Lantana camara, Anredera cordifolia, Bryophyllum delagoense,Tradescantia fluminensis, Ageratina adenophora, Asparagus spp., Chrysanthemoides monilifera subsp. rotundata, Ipomoea cairica, Delairea odorata*	EECs: Illawarra Subtropical Rainforest; Swamp Oak Floodplain Forest (BPWW – CC1)	Asset protection	Bush regeneration	C-TSC
Illawarra	Berkeley NR	2378 - Hooka Island	*Lantana camara, Anredera cordifolia, Bryophyllum delagoense,Tradescantia fluminensis, Ageratina adenophora, Asparagus spp., Chrysanthemoides monilifera subsp. rotundata, Ipomoea cairica, Delairea odorata*	EECs: Illawarra Subtropical Rainforest; Swamp Oak Floodplain Forest (BPWW – CC1)	Asset protection	Bush regeneration	C-TSC

Area	Reserve(s)	Site name	Target pests or weeds	Asset at risk	Aim of control	Action	Priority
Illawarra	Dharawal NP	Boundaries	Rusa deer	EECs: Southern Sydney Sheltered Forest on Transitional Sandstone Soils in the Sydney Basin Bioregion, Illawarra Sub-tropical Rainforest, Illawarra Coastal Grassy Woodland. Endangered: *Arthropteris palisotii, Cynanchum elegans, Daphnandra sp. Illawarra, Zieria granulate, Pomaderris adnata, Irenepharsus trypherus.* Vulnerable: *Syzygium paniculatum*, *Pultenaea aristata*, *Haloragis exalata subsp. Exalata var. exalata*. *Callitris endlicheri.* Regenerating forest.	Asset protection	Ground shooting	C-TSC
Illawarra	Illawarra Escarpment State Conservation Area	Upland Swamps, Moist Forests, Maddens Plains and Boundaries	Rusa deer	EECs: Southern Sydney Sheltered Forest on Transitional Sandstone Soils in the Sydney Basin Bioregion, Illawarra Sub-tropical Rainforest, Illawarra Coastal Grassy Woodland. Endangered: *rthropteris palisotii, Cynanchum elegans, Daphnandra sp. Illawarra, Zieria granulate, Pomaderris adnata, Irenepharsus trypherus.* Vulnerable: *Syzygium paniculatum*, *Pultenaea aristata*, *Haloragis exalata subsp. Exalata var. exalata*. *Callitris endlicheri.* Regenerating forest.	Asset protection	Ground shooting	C-TSC

Area	Reserve(s)	Site name	Target pests or weeds	Asset at risk	Aim of control	Action	Priority
Illawarra	Upper Nepean State Conservation Area	Southern boundaries	Rusa deer	EECs: Shale/Sandstone Transition Forest, Southern Highlands Shale Woodland, Robertson Basalt Tall Open Forest, Robertson Rainforest, O'Hares Creek Shale Forest, Montane Peatland and Swamp, Cumberland Plain Woodland. Endangered *Persoonia bargoensis, P. glaucescens,* Vulnerable *Epacris purpurascens var. purpurascens*, *Melaleuca deanei* and *Grevillea parviflora*	Asset protection	Ground shooting	C-TSC
Nowra	Worrigee NR	2581 - Worrigee NR	*Ageratina adenophora, Cinnamomum camphora), Rubus spp.*	Illawarra Lowlands Grassy Woodland EEC (E3, TSC-e), green and golden bell frog (EPBC-v; TSC-e), Illawarra greenhood orchid (*Pterostylis gibbosa*) (BPWW – CC1)	Asset protection	Hand pulling, cut and paint and ground spraying	C-TSC
Nowra	Bugong NP	2651 - Old quarry sites (Lower Bugong Road), along Abernathy Creek	*Ageratina riparia, Lantana camara camara), Cirsium vulgare, Rubus fruticosus agg., Ageratina adenophora*	Illawarra Sub-tropical Rainforest in the Sydney Bioregion (E3), Riparian River Oak Acacia Shrub-Grass-Herb Forest (BPWW – CC*)	Asset protection	Hand pulling, cut and paint and ground spraying	C-TSC
Nowra	Bomaderry Creek Regional Park	2384 - Bomaderry Creek Bushland	*Bryophyllum delagoense, Lantana camara, Ageratina adenophora, Ageratina riparia, Cortaderia selloana, Eragrotis curvulaligustrum sinense, Acetosa sagittata, Anredera cordifolia, Andropogon virginicus, Allanthus altissima*	*Zieria baeuerlenii* (EPBC-e; TSC-e), *Eucalyptus langleyi* (EPBC-v; TSC-v), Coastal Tall Wet Heath Swamp Forest (BPWW – CC1)	Asset protection	Hand pulling, cut and paint and ground spraying	C-TSC
Nowra	Jervis Bay NP	2650 - North Jervis Bay	*Chrysanthemoides monilifera* subsp. *rotundata*	Swamp Oak Floodplain Forest (TSC-e), Bangalay Sand Forest (TSC-e), Littoral Rainforest (EPBC-ce; TSC-e), Freshwater Wetlands EECs (TSC-e) (BPWW – CC*)	Asset protection	Ground spraying	C-TSC

Area	Reserve(s)	Site name	Target pests or weeds	Asset at risk	Aim of control	Action	Priority
Nowra	Jervis Bay NP	2459 - Hyams Beach (area 8)	*Chrysanthemoides monilifera subsp. rotundata, Dipogon lignosus, Passiflora spp., Asparagus aethiopicus, Senna pendula, Watsonia sp., Erythrina x sykesii*	Blackbutt forest, heath, open forest, Bangalay Sand Forest EEC (TSC-e) (BPWW – CC1)	Asset protection	Hand pulling, cut and paint and ground spraying	C-TSC
Nowra	Jervis Bay NP	2573 - Vincentia (Area 7)	*Chrysanthemoides monilifera subsp. rotundata, Senna pendula, Rubus fruticosus agg., Ageratina riparia, Pinus radiata, Lonicera japonica, Passiflora spp., Asparagus aethiopicus, Hedera helix, Billardiera heterophylla, Crocosmia x crocosmiiflora, Erythrina x sykesii, Crassula sp.*	Freshwater Wetland (TSC-e), Swamp Sclerophyll Forest (TSC-e), Bangalay Sand Forest (TSC-e), Coastal Saltmarsh EECs (TSC-e) (BPWW – CC2)	Asset protection	Hand pulling, cut and paint and ground spraying	C-TSC
Nowra	Morton NP	Shoalhaven River and tributaries	Feral goats	Brush-tailed rock-wallaby	Asset protection	Ground shooting and aerial shooting	C-TSC
Nowra	Bugong NP	Kangaroo Valley	Foxes	Brush-tailed rock-wallaby	Asset protection	Ground baiting, trapping and shooting	C-TSC
Nowra	Comerong Island NR; Seven Mile Beach NP	Comerong Island	Foxes, cats, silver gulls, ravens and dogs	Pied oystercatcher (*Haematopus longirostris*), little tern (*Sterna albifrons*)	Asset protection	Ground baiting, trapping and shooting	C-TSC
Nowra	Jervis Bay NP	Lake Wollumboola	Foxes, ravens and silver gulls	Little tern and pied oystercatcher	Asset protection	Ground baiting, trapping and shooting	C-TSC
Nowra	Seven Mile Beach NP	2551 - South Seven Mile Beach	*Lantana camara, Chrysanthemoides monilifera* subsp. *rotundata, Acetosa sagittata, Araujia sericifera*	Bangalay Sand Forest EEC (TSC-e) (BPWW – CC1)	Asset protection	Hand pulling, cut and paint and ground spraying	C-TSC

Area	Reserve(s)	Site name	Target pests or weeds	Asset at risk	Aim of control	Action	Priority
Nowra	Seven Mile Beach NP	2513 - North Seven Mile Beach	*Lantana camara, Chrysanthemoides monilifera* subsp*. rotundata, Ageratina adenophora, Ageratina riparia, Erythrina x sykesii, Araujia sericifera, Pennisetum clandestinum, Tradescantia fluminensis, Acetosa sagittata, Anredera cordifolia, Asparagus spp.*	Littoral Rainforest EEC (EPBC-ce; TSC-e) and transitional Rainforest, Bangalay Sand Forest EEC (TSC-e) (BPWW – CC1)	Asset protection	Hand pulling, cut and paint and ground spraying	C-TSC
Nowra	Brundee Swamp NR, Saltwater Swamp NR	2387 - Brundee Swamp and Saltwater	*Lantana camara, Chrysanthemoides monilifera* subsp*. rotundata, Araujia sericifera*	*E. robusta* Swamp Forest, Coastal Saltmarsh (TSC-e), Swamp Oak Floodplain Forest (TSC-e), Freshwater Wetland EECs (TSC-e) (BPWW - CC2)	Asset protection	Hand pulling, cut and paint and ground spraying	C-TSC
Nowra	Seven Mile Beach NP	2421 - Coomanderry Swamp	*Lantana camara, Chrysanthemoides monilifera subsp. rotundata, Pennisetum clandestinum*	Freshwater Wetlands on Coastal Floodplain EEC (TSC-e), Swamp Oak Floodplain Forest (TSC-e), Bangalay Sand Forest EECs (TSC-e) (BPWW – CC1)	Asset protection	Hand pulling, cut and paint and ground spraying	C-TSC
Nowra	Jervis Bay NP	2402 - Carama Inlet (Area 3)	*Lantana camara, Chrysanthemoides monilifera* subsp*. rotundata, Senna spp, Erythrina x sykesii*	Swamp Oak Floodplain Forest (TSC-e), Bangalay Sand Forest (TSC-e), Littoral Rainforest (EPBC-ce; TSC-e), Freshwater Wetlands EECs (TSC-e) (BPWW – CC1)	Asset protection	Hand pulling, cut and paint and ground spraying	C-TSC
Nowra	Morton NP	2546 - Shoalhaven River	*Lantana camara, Ligustrum sinense, Tradescantia fluminensis, Acetosa sagittata, Ailanthus altissima, Senna spp., Araujia sericifera*	River Flat Eucalypt Forest EEC (TSC-e) (BPWW – CC2)	Asset protection	Hand pulling, cut and paint and ground spraying	C-TSC
Nowra	Triplarina NR	2438 - Flat Rock Creek	*Lantana camara, Rubus fruticosus agg., Chlorophytum comosum, Bryophyllum delagonense, Erythrina x sykesii*	Riparian vegetation - *melaleuca; Cryptostylis hunterinana* (EPBC-v; TSC-v), *Triplarina nowraensis* (EPBC-e; TSC-e), River Flat Eucalypt Forest EEC (TSC-e) (BPWW – CC1)	Asset protection	Hand pulling, cut and paint and ground spraying	C-TSC

Area	Reserve(s)	Site name	Target pests or weeds	Asset at risk	Aim of control	Action	Priority
Nowra	Morton NP	2465 - Iron pot clearing and Tolwong	*Nassella trichotoma*	Tableland Basalt Forest EEC (TSC-e) (BPWW – CC2)	Asset protection	Hand pulling, cut and paint and ground spraying	C-TSC
Nowra	Jervis Bay NP	2458 - Huskisson (part of Area 6)	*Senna pendula, Ageratina riparia, Rubus fruticosus agg., Lonicera japonica, Dipogon lignosus, Ligustrum sinense, Salix spp.*	Freshwater Wetlands (TSC-e), Swamp Sclerophyll Forest EECs (TSC-e) (BPWW – CC2)	Asset protection	Hand pulling, cut and paint and ground spraying	C-TSC
Nowra	Comerong Island NR	2415 - Comerong Island NR	*Anredera cordifolia, Asparagus spp., Chrysanthemoides monilifera subsp. rotundata, Lantana camara, Juncus acutus*	Grey-headed flying-fox colony (EPBC-v; TSC-v), *E.botryoides/B. serrata* Sand Forest, Littoral Rainforest (EPBC-ce; TSC-e), Grey Mangrove and Coastal Saltmarsh EECs (TSC-e) (BPWW – CC1)	Asset protection	Hand pulling, cut and paint and ground spraying	C-TSC
Ulladulla	Tollgate Islands NR	2567 - Tollgate Islands, Cliffs and plateaus of island, gullies	*Acetosa sagittata*	Impacting on Themeda Grassland on Seacliffs and Coastal Headlands EEC (TSC-e) (BPWW – CC1)	Asset protection	Herbicide spraying, hand pulling and aerial spraying	C-TSC
Ulladulla	Meroo NP	2425 - Crampton Island	*Acetosa sagittata, Stenotaphrum secundatum*	Themeda Grassland on Seacliffs and Coastal Headlands EEC (TSC-e) (BPWW – CC1)	Asset protection	Herbicide spraying and hand pulling	C-TSC
Ulladulla	Meroo NP	2489 - Meroo coastal communities (Willinga Beach, Meroo Beach, Termeil Beach, Tabourie Beach)	*Asparagus aethiopicus, Araujia sericifera, Anredera cordifolia, Euphorbia paralias, Acetosa sagittata Asparagus scandens Buchloe dactyloides, Panicum sp., Lonicera japonica, Chlorophytum comosum, Erythrina crista-galli Aristea Eklonii Cortaderia jubata, Pinus radiata*	Threatened species habitat, pied oystercatcher (TSC-e) and hooded plover (TSC-ce), Bangalay Sand Forest EEC (TSC-e) (BPWW – CC2)	Asset protection	Herbicide spraying and hand pulling	C-TSC
Ulladulla	Cullendulla Creek NR	2429 - Cullendulla Creek	*Asparagus aethiopicus, Asparagus asparagoides, Delairea odorata, Senna spp., Juncus acutus Acetosa sagittata, Opuntia spp.*	Rainforest*, E. tereticornis/botryoides* forest, *Banksia serrata understorey*, Saltmarsh (BPWW – CC1)	Asset protection	Herbicide spraying and hand pulling	C-TSC

Area	Reserve(s)	Site name	Target pests or weeds	Asset at risk	Aim of control	Action	Priority
Ulladulla	Clyde River NP	2411 - Clyde River riverbanks and islands	*Asparagus asparagoides, Buchloe dactyloides, Delairea odorata, Lantana camara, Juncus acutus, Asparagus scandens, Rubus fruticosus agg., Solanum nigrum, Conzya spp. Sporobolus fertilis, Solanum pseudocapsicum , Verbena bonariensis, Sida Rhombifolia, Passifora spp., Solanum mauritianum Tradescantia fluminensis*	Mudflats, saltmarshes, Swamp Oak Floodplain Forest (TSC-e), Coastal Saltmarsh EECs (TSC-e) (BPWW – CC1)	Asset protection	Herbicide spraying and hand pulling	C-TSC
Ulladulla	Conjola NP	2494 - Monument Beach, Berrara Beach, Conjola Beach, Buckleys Beach	*Asparagus scandens, Asparagus africanus, Bryophyllum spp.*	Dry coastal sand forest, swamp forest and heathlands, littoral rainforest, threatened species habitat, pied oystercatcher and hooded plover (BPWW – CC2)	Asset protection	Herbicide spraying, hand pulling	C-TSC
Ulladulla	Meroo NP	2394 - Burrill Lake - fringes	*Asparagus scandens, Buchloe dactyloides, Onopordum acanthium*	Swamp Oak Floodplain Forest EEC (TSC-e) (BPWW – CC1)	Asset protection	Herbicide spraying	C-TSC
Ulladulla	Conjola NP	2563 - The Haven/Alamein Track and Walter Hood (coastal disturbed sites)	*Bryophyllum spp., Asparagus africanus, Solanum mauritianum, Stenotaphrum secundatum*	Bangalay Sand Forest EEC (TSC-e) (BPWW – CC1)	Asset protection	Herbicide spraying and hand pulling	C-TSC
Ulladulla	Conjola NP, Narrawallee NR	Conjola	Foxes, silver gulls and ravens	Hooded plover, little tern and pied oystercatcher	Asset protection	Baiting, shooting, trapping and den fumigation	C-TSC
Ulladulla	Murramarang NP, Murramarang Aboriginal Area, Meroo NP	Murramarang	Foxes, silver gulls and ravens	Hooded plover and pied oystercatcher	Asset protection	Baiting, shooting, trapping and den fumigation	C-TSC

Area	Reserve(s)	Site name	Target pests or weeds	Asset at risk	Aim of control	Action	Priority
Ulladulla	Clyde River NP	2521 - Patches along river bank, islands and tributaries	*Juncus acutus*	Coastal Saltmarsh EEC (TSC-e) (BPWW – CC2)	Asset protection	Herbicide spraying and hand pulling	C-TSC
Ulladulla	Narrawallee Creek NR	2523 - Pattimores lagoon	*Juncus acutus*	Coastal Saltmarsh (TSC-e), Swamp Oak Floodplain Forest EECs (TSC-e) (BPWW – CC1)	Asset protection	Herbicide spraying	C-TSC
Ulladulla	Yatteyattah NR	2583 - Yatteyattah Rainforest - Lantana	*Lantana camara*	Milton Ulladulla Subtropical Rainforest EEC (TSC-e) (BPWW – CC2)	Asset protection	Herbicide spraying, hand pulling, biological control	C-TSC
Ulladulla	Narrawallee Creek NR	2507 - Narrawallee inlet, Buckleys Beach	*Lantana camara, Juncus acutus, Acetosa sagittata, Acetosa sagittata*	Swamp Oak Floodplain Forest (TSC-e), Freshwater Wetlands on Coastal Floodplains (TSC-e), Coastal Saltmarsh EECs (TSC-e) Bangalay Sand Forest, Coastal Banksia Woodlands (*Banksia integrifolia*) (BPWW – CC1)	Asset protection	Herbicide spraying and hand pulling	C-TSC
Ulladulla	Yatteyattah NR	2582 - Yatteyattah Rainforest	*Rubus fruticosus agg., Asparagus asparagoides, Senna artemisioides, Anredera cordifolia, Macfadyena unguis-cati Ipomoea jalapa, Solanum crispum, Tradescantia fluminernsis, Solanum pseudocapsicum, Araujia hortorum Ligustrum sinense, Passifora spp Solanum mauritianum*	Milton Ulladulla Sub-tropical Rainforest EEC (TSC-e) (BPWW – CC1)	Asset protection	Herbicide spraying, hand pulling and biological control	C-TSC
Highlands	Bangadilly NP	Southern Highlands Wild Dog Management Plan	Wild dogs	Livestock	Asset protection	Ground baiting, trapping and monitoring	C-EC

Area	Reserve(s)	Site name	Target pests or weeds	Asset at risk	Aim of control	Action	Priority
Highlands	Bungoina NP	Shoalhaven Wild Dog Management Plan	Wild dogs	Livestock	Asset protection	Ground baiting, trapping and monitoring	C-EC
Highlands	Bungonia State Conservation Area	Shoalhaven Wild Dog Management Plan	Wild dogs	Livestock	Asset protection	Ground baiting, trapping and monitoring	C-EC
Highlands	Morton NP	Shoalhaven Wild Dog Management Plan	Wild dogs	Livestock	Asset protection	Ground baiting, trapping and monitoring	C-EC
Highlands	Nadgigomar NR	Shoalhaven Wild Dog Management Plan	Wild dogs	Livestock	Asset protection	Ground baiting, trapping and monitoring	C-EC
Highlands	Tarlo River NP	Southern Highlands Wild Dog Management Plan	Wild dogs	Livestock	Asset protection	Ground baiting, trapping and monitoring	C-EC
Nowra	Morton NP	Braidwood-South Coast Wild Dog Management Plan	Wild dogs	Livestock	Asset protection	Ground baiting, trapping, ejectors and monitoring	C-EC
Nowra	Jerrawangala NP	Shoalhaven Wild Dog Management Plan.	Wild dogs and foxes	Livestock	Asset protection	Ground baiting and trapping	C-EC
Nowra	Parma Creek NR	Shoalhaven Wild Dog Management Plan	Wild dogs and foxes	Livestock	Asset protection	Ground baiting and trapping	C-EC

Area	Reserve(s)	Site name	Target pests or weeds	Asset at risk	Aim of control	Action	Priority
Ulladulla	Bees Nest NR	Braidwood-South Coast Wild Dog Management Plan	Wild dogs and foxes	Livestock	Asset protection	Baiting, trapping, shooting and aerial baiting	C-EC
Ulladulla	Bimberamala NP	Braidwood-South Coast Wild Dog Management Plan	Wild dogs and foxes	Livestock	Asset protection	Baiting and trapping	C-EC
Ulladulla	Budawang NP	Braidwood-South Coast Wild Dog Management Plan	Wild dogs and foxes	Livestock	Asset protection	Baiting, trapping and shooting,	C-EC
Ulladulla	Conjola NP	Braidwood-South Coast Wild Dog Management Plan	Wild dogs and foxes	Livestock	Asset protection	Baiting and trapping	C-EC
Ulladulla	Meroo NP	Braidwood-South Coast Wild Dog Management Plan	Wild dogs and foxes	Livestock	Asset protection	Baiting and trapping	C-EC
Ulladulla	Morton NP	Braidwood-South Coast Wild Dog Management Plan	Wild dogs and foxes	Livestock	Asset protection	Baiting, trapping, shooting and aerial baiting	C-EC
Ulladulla	Murramarang NP	Braidwood-South Coast Wild Dog Management Plan	Wild dogs and foxes	Livestock	Asset protection	Baiting and trapping	C-EC
Illawarra	Berkeley NR	Gooseberry Island	*Alternanthera philoxeroides*		Eradication	Ground spraying	C-NE
Illawarra	Berkeley NR	Hooka Island	*Alternanthera philoxeroides*		Eradication	Ground spraying	C-NE
Illawarra	Illawarra Escarpment State Conservation Area	Mt Keira	*Caesalpinea decapetala*		Eradication	Ground spraying	C-NE

Area	Reserve(s)	Site name	Target pests or weeds	Asset at risk	Aim of control	Action	Priority
Ulladulla	Cullendulla Creek NR	Square Head and Cullendulla Ck	*Chrysanthemoides monilifera* subsp. *monilifera*		Eradication	Herbicide spraying and hand pulling	C-NE
Ulladulla	Cullendulla Creek NR	Square Head and Cullendulla Ck	*Chrysanthemoides monilifera* subsp. *rotundata*		Containment	Herbicide spraying and hand pulling	C-NE
Ulladulla	Conjola NP	Conjola	*Euphorbia paralias, Chrysanthemoides monilifera* subsp*. rotundata*		Containment	Herbicide spraying, hand pulling	C-NE
Ulladulla	Meroo NP	Meroo	*Euphorbia paralias, Chrysanthemoides monilifera* subsp*. rotundata*		Containment	Herbicide spraying and hand pulling	C-NE
Ulladulla	Murramarang NP	Murramarang	*Euphorbia paralias, Chrysanthemoides monilifera* subsp*. rotundata*		Containment	Herbicide spraying	C-NE
Ulladulla	Narrawallee Creek NR	Narrawallee inlet and beaches	*Euphorbia paralias, Chrysanthemoides monilifera* subsp*. rotundata*		Containment	Herbicide spraying and hand pulling	C-NE
Ulladulla	Tollgate Islands NR	Tollgate Islands	*Euphorbia paralias, Chrysanthemoides monilifera* subsp. *rotundata*		Eradication	Herbicide spraying, hand pulling and aerial spraying	C-NE
Ulladulla	Brush Island NR	2366 –Beach on southern end of island (BPWW – CC3)	*Euphorbia paralias, Rubus fruticosus* agg.		Containment	Herbicide spraying and hand pulling	C-NE
Ulladulla	Bimberamala NP	Surrounding inholding	Feral deer		Containment	Shooting	C-NE
Ulladulla	Brush Island NR	2522 - Patches, southern end of island (BPWW – CC3)	*Pennisetum clandestinum*		Containment	Herbicide spraying	C-NE

Area	Reserve(s)	Site name	Target pests or weeds	Asset at risk	Aim of control	Action	Priority
Ulladulla	Murramarang NP	Mt Durras	*Aristea ecklonii, Sida rhombifolia, Onopordum acanthium Sida rhombifolia, Erythrina crista-galli*	Invading rainforest, excluding native vegetation	Asset protection	Herbicide spraying	M-RA
Ulladulla	Meroo NP	Bush Mission	*Chlorophytum comosum, Erythrina crista-galli*	Aesthetic values	Asset protection	Herbicide spraying	M-RA
Highlands	Cecil Hoskins NR	2403 - Cecil Hoskins NR	*Salix cinerea, Rubus fruticosus, Hedera helix, Crataegus monogyna, Ulex europaeus*	Southern Highlands Shale Woodlands on the talus slopes and patches of Illawarra Sub-tropical Rainforest (BPWW – CC3)	Asset protection	Spray, cut and paint and hand removal	M-CP
Illawarra	Illawarra Escarpment State Conservation Area	Thirroul-Stanwell Park	*Cortaderia selloana*		Containment	Ground spraying	M-CP
Illawarra	Dharawal NP	Roads, utility easements and boundaries	*Andropogon virginicus*		Containment	Ground spraying	M-CP
Illawarra	Dharawal NR	Roads, utility easements and boundaries	*Andropogon virginicus*		Containment	Ground spraying	M-CP
Illawarra	Illawarra Escarpment State Conservation Area	Roads, utility easements and boundaries	*Andropogon virginicus*		Containment	Ground spraying	M-CP

Area	Reserve(s)	Site name	Target pests or weeds	Asset at risk	Aim of control	Action	Priority
Illawarra	Upper Nepean State Conservation Area	985 - Southern boundaries	*Rubus fruticosus agg., Ulex europaeus, Andropogon virginicus, Cortaderia selloana, Eragrostis curvula, Ipomoea indica, Cirsium vulgare, Asparagus asparagoides, Pinus radiata, Nassella trichotoma, Agapanthus praecox, Ligustrum sinense, Watsonia sp., Acetosa sagittata, Gomphocarpus fruticosus, Agave americana, Nerium oleander, Hypericum sp., Genista monspessulana*	EECs: Shale/Sandstone Transition Forest, Southern Highlands Shale Woodland, Robertson Basalt Tall Open Forest, Robertson Rainforest, O'Hares Creek Shale Forest, Montane Peatland and Swamp, Cumberland Plain Woodland. Endangered: *Persoonia bargoensis, P. glaucescens.* Vulnerable: *Epacris purpurascens* var*. purpurascens*, *Melaleuca deanei* , *Grevillea parviflora* (BPWW – CC3)	Asset protection	Ground spraying	M-CP
Nowra	Morton NP	2431 - Yalwal Creek / Shoalhaven River Junction	*Ailanthus altissima, Lantana camara camara, Ligustrum sinense, Tradescantia fluminensis, Acetosa sagittata,Senna spp., Araujia sericifera, Rubus fruticosus agg*	EEC (River Flat Eucalypt Forest) (BPWW – CC4)	Asset protection	Ground spraying and cut and paint	M-CP
Nowra	Jervis Bay NP	Bherwerre Peninsula	Foxes	Eastern bristlebird, eastern chestnut mouse, ground parrot	Asset protection	Ground baiting	M-CP
Nowra	Woollamia NR	Woollamia NR	Foxes	Eastern bristlebird, eastern chestnut mouse, ground parrot	Asset protection	Ground baiting	M-CP
Nowra	Bamarang NR	2363 - Bamarang NR	*Lantana camara*	River Flat Eucalypt Forest EEC (TSC-e), *Casuarina cunninghamii* Forest (BPWW – CC4)	Asset protection	Hand pulling, cut and paint and ground spraying	M-CP
Nowra	Jerrawangala NP	2357 - Adjoining another property	*Lantana camara*	Coastal Hinterland Ecotonal Gully Rainforest (BPWW – CC5)	Asset protection	Hand pulling, cut and paint and ground spraying	M-CP
Nowra	Morton NP	2437 - Ettrema Creek	*Lantana camara, Ailanthus altissima, Rubus fruticosus agg.*	River Flat Eucalypt Forest EEC (TSC-e) (BPWW – CC4)	Asset protection	Hand pulling, cut and paint and ground spraying	M-CP

Area	Reserve(s)	Site name	Target pests or weeds	Asset at risk	Aim of control	Action	Priority
Nowra	Cullunghutti Aboriginal Area	2418 - Coolangatta Mountain	*Lantana camara, Delairea odorata, Olea europea subsp. cuspidata, Ageratina adenophora*	Illawarra Subtropical Rainforest EEC (TSC-e), Red Gum Forest (BPWW – CC5)	Asset protection	Hand pulling, cut and paint and ground spraying	M-CP
Nowra	Colymea State Conservation Area	2398 - Colymea Creek	*Lantana camara, Rubus fruticosus agg., Ageratina riparia*	River Flat Eucalypt Forest (TSC-e), Illawarra Subtropical Rainforest EECs (TSC-e) (BPWW – CC4)	Asset protection	Hand pulling, cut and paint and ground spraying	M-CP
Nowra	Wogamia NR	2539 - Riverflat	*Lantana camara, Rubus fruticosus agg., Tradescantia fluminensis, Ageratina riparia, Ligustrum sinense,*	River Flat Eucalypt Forest EEC (TSC-e), *Casuarina cunninghamii* Forest (BPWW – CC4)	Asset protection	Hand pulling, cut and paint and ground spraying	M-CP
Nowra	Morton State Conservation Area	2447 - Gassy Gully Creek and Shoalhaven River	*Rubus fruticosus agg., Lantana camara, Araujia sericifera, Ligustrum sinense, Ageratina riparia, Tradescantia fluminensis*	River Flat Eucalypt Forest EEC (TSC-e) (BPWW – CC4)	Asset protection	Hand pulling, cut and paint and ground spraying	M-CP
Nowra	Corramy Regional Park	2440 - Four Ways	*Stenotaphrum secundatum, Lilium formosanum*	Swamp Oak Floodplain Forest (TSC-e); Coastal Saltmarsh EECs (TSC-e) (BPWW – CC3)	Asset protection	Hand pulling, cut and paint and ground spraying	M-CP
Ulladulla	Murramarang NP	2554 - Southern Murramarang beaches (sth of Mt Durras)	*Erythrina crista-galli, Senna pendula* var. *Glabrata Buchloe dactyloides Rubus fruticosus, Aristea ecklonii, Anredera cordifolia, Ipomoea jalapa, Solanum crispum, Solanum pseudocapsicum, Conzya spp., Erythrina crista-galli, Sida rhombifolia Zantedeschia aethiopica Sida rhombifolia, Onopordum acanthium Sida rhombifolia, Senna pendula* var. *glabrata, Juncus acutus, Acetosa sagittata*	Swamp Sclerophyll Forest on Coastal Floodplains (TSC-e) Bangalay Sand Forest (TSC-e) Coastal Saltmarsh EECs (TSC-e) (BPWW – CC3)	Asset protection	Herbicide spraying, hand pulling	M-CP
Ulladulla	Narrawallee Creek NR	2505 - Narrawallee beach	*Lantana camara , Acetosa sagittata, Asparagus scandens*	Threatened Species Habitat, pied oystercatcher (TSC-v) and hooded plover (TSC-ce), Bangalay Sand Forest EEC (TSC-e) (BPWW – CC3)	Asset protection	Herbicide spraying	M-CP

Area	Reserve(s)	Site name	Target pests or weeds	Asset at risk	Aim of control	Action	Priority
Ulladulla	Bees Nest NR	Cleared areas in reserve	*Nassella trichotoma*		Containment	Herbicide spraying	M-CP
Ulladulla	Yatteyattah NR	2448 - Grassy woodland and powerlines (BPWW – CC4)	*Olea europea* subsp. *cuspidata Sporobolus fertilis Senecio madagascariensis*		Containment	Herbicide spraying	M-CP
Ulladulla	Brush Island NR	Northern end of island	*Opuntia spp.*		Containment	Herbicide spraying, and hand pulling	M-CP
Ulladulla	Murramarang NP	2514 - Northern Murramarang beaches (north of Mt Durras)	*Zantedeschia aethiopica, Rubus fruticosus agg., Anredera cordifolia, Araujia sericifera,Senna spp.*	Threatened Species Habitat, pied oystercatcher (TSC-e) and hooded plover (TSC-ce, Swamp Oak Floodplain Forest (TSC-e) and Freshwater Wetlands on Coastal Floodplains EECs (TSC-e) (BPWW – CC3)	Asset protection	Herbicide spraying	M-CP
Illawarra	Five Islands NR	Flinders Island	*Chrysanthemoides monilifera* subsp. *rotundata*		Containment	Ground spraying and hand pulling	M-II
Illawarra	Five Islands NR	2379 - Big Island (BPWW – CC3)	*Pennisetum clandestinum, Ipomoea purpurea, Coprosma repens, Chrysanthemoides monilifera subsp. rotundata*		Containment	Burning, Ground spraying and bush regeneration	M-II
Highlands	Bungonia State Conservation Area	Becks Gully	*Ailanthus alitissima*		Containment	Cut and paint	L-LP
Highlands	Bungonia NP	Camping area and surrounds	*Nassella trichotoma*		Containment	Spray	L-LP
Highlands	Tarlo River NP	2471 - Kerrawary Creek (BPWW – CC5)	*Nassella trichotoma, Echium plantagineum*		Containment	Spray	L-LP

Area	Reserve(s)	Site name	Target pests or weeds	Asset at risk	Aim of control	Action	Priority
Illawarra	Dharawal NR	Dharawal	*Eragrostis curvula*		Containment	Ground spraying	L-LP
Ulladulla	Conjola NP	Conjola	Feral cats		Containment	Trapping	L-LP
Ulladulla	Morton and Meroo NP	Meroo	Feral cats		Containment	Trapping and shooting	L-LP
Ulladulla	Budawang NP	Mongarlowe	Feral pigs		Containment	Trapping, baiting and shooting	L-LP
Ulladulla	Morton NP	Endrick River	Feral pigs		Containment	Trapping, baiting, and shooting	L-LP
Ulladulla	Morton NP	Alum Creek	Feral pigs		Containment	Trapping, baiting and shooting	L-LP
Ulladulla	Murramarang NP	Whole park	Feral pigs		Containment	Trapping, baiting and shooting	L-LP
Highlands	Cecil Hoskins NR	Whole reserve	Foxes		Containment	Ground baiting	L-PP
Highlands	Bungonia NP	Shoalhaven River and tributary	Feral goats and feral pigs		Containment	Aerial shooting and opportunistic ground shooting	L-PP
Highlands	Bungonia State Conservation Area	Shoalhaven River and tributaries	Feral goats and feral pigs		Containment	Aerial shooting and opportunistic ground shooting	L-PP
Highlands	Jerralong NR	Jerralong	Feral goats and feral pigs		Containment	Aerial shooting	L-PP

Area	Reserve(s)	Site name	Target pests or weeds	Asset at risk	Aim of control	Action	Priority
Highlands	Tarlo River NP	Tarlo River and Kerrawary Creek	Feral goats and feral pigs		Containment	Aerial shooting and opportunistic ground shooting	L-PP
Highlands	Morton NP	McCallums Flat	*Nassella trichotoma, Salix spp.*		Containment	Aerial and ground spray, cut and paint	L-PP
Highlands	Nadgigomar NR	Sunset Mountain	Feral pigs		Containment	Ground baiting, trapping and ground and aerial shooting	L-PP
Illawarra	Dharawal NP, Dharawal NR, Illawarra Escarpment State Conservation Area	Upland swamps and boundaries	Foxes	Native fauna	Asset protection	Ground baiting	L-PP
Illawarra	Illawarra Escarpment State Conservation Area	Moist Forest corridor and boundaries	Foxes	Native fauna	Asset protection	Ground baiting	L-PP
Ulladulla	Clyde River NP	Edge of Kings Highway	*Andropogon virginicus*		Containment	Herbicide spraying	L-PP
Ulladulla	Bees Nest NR	Shoalhaven River and tributaries	Feral goats and feral pigs		Containment	Aerial shooting	L-PP

* Not yet ranked as of June 2012

5. Consultation

The South Coast regional pest management strategy was developed through consultation with the community and internal staff. A pest management strategy stakeholder forum was conducted at Nowra Showground on 6 September 2011. A diverse range of community representatives was present, including representatives from the South Coast Region Advisory Committee, Game Council of NSW, local councils, Southern Rivers Catchment Management Authority, NSW Farmers Association, Forests NSW, Department of Defence, Livestock Health and Pest Authorities, Illawarra Noxious Weeds Authority and several other stakeholder groups.

Key issues raised from this forum (with reference to the state strategy) were:

- identifying and taking strategic and adequate action to control pest species such as wild dogs and deer as part of coordinated programs (Goal 3, Objective 3.1)
- proactively incorporating volunteers into pest programs where possible (Goal 3, Objective 3.2)
- undertaking research to address where there is a paucity of information in relation to the ecology and control techniques of pests; once this information is obtained, make it available and use it to enhance control programs (Goal 3, Objective 3.1)
- a need for additional resources to adequately control pest species (Goal 3, Objective 3.1)
- prioritising where funds should be directed and where pest programs should be undertaken (Goal 2, Objective 2.1)
- managing pests at a landscape scale; planning should take a nil tenure approach (Goal 2, Objective 2.2)
- more effective communication and education of the community and stakeholders (Goal 3, Objective 3.2)
- increased monitoring and reporting (Goal 3, Objective 3.4).

Detailed recommendations made during the forum have been incorporated into the body of this strategy where appropriate.

Consultation was conducted with each operational Area's key staff within the Region to assist with the identification and prioritisation of key pest management programs. The draft pest management strategy was placed on public exhibition, with comments invited from the community, other government agencies and stakeholder groups. Ongoing stakeholder engagement will be a priority, and will involve discussing information and issues in regards to pest management programs involving the SC Regional Advisory Committee, national park staff, contractors, working groups, other government agencies, volunteers, neighbours and communities.

Specific actions in relation to ongoing stakeholder engagement will be:

- attending wild dog management meetings
- working with the Friends of the BTRW and SCSRP volunteers
- continuing engagement and collaborative work with government agencies such as Sydney Catchment Authority, catchment management authorities, LHPAs, Forests NSW, Department of Defence, Illawarra Noxious Weeds Authority and local government
- on-site meetings with neighbours and community members to discuss issues and management of pest programs
- engagement and collaboration with contractors in relation to pest control
- attending field days throughout South Coast Region.

6. Pest species overviews

Information about high profile pests in the 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]

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.

Wild dogs are present throughout South Coast Region on private, Forests NSW and NPWS lands. Their abundance varies due to limiting factors such as food, terrain and control practices.

Impacts

Wild dogs can have significant impacts on livestock, especially sheep. 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.[3]

Wild dogs can also 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 over-grazing across much of the 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 NSW *Threatened Species Conservation Act 1995* (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 (KTP) 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

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[2] http://www.invasiveanimals.com/

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.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/

http://www.environment.nsw.gov.au/CMAweeds/index.htm

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

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.

Priorities for control

All wild dog management plans are a critical priority. In South Coast Region wild dog management is implemented under the following cooperative plans:

- Southern Highlands Wild Dog Management Plan
- Shoalhaven Wild Dog Management Plan
- Braidwood–South Coast Wild Dog Management Plan.

Control

The three wild dog management plans have been cooperatively developed by wild dog management committees that consist of stakeholders from government agencies and landholders. All wild dog control in the Region will be guided by these plans. This includes strategic and reactive control programs. Methods used to control wild dogs may include, but are not limited to, soft-jaw trapping, ground baiting, aerial baiting and opportunistic shooting.

Monitoring

Monitoring will be conducted as outlined in the wild dog management plans. These methods may include sand pads, cameras, visual observation, howling reports, animals controlled, animals that have been predated on and bait takes.

Red fox (*Vulpes vulpes*)

Distribution and abundance

Foxes are found in most Australian environments, and in rural areas are most abundant near rural residential and agricultural lands. Modified landscapes interspersed with bushland provide ideal habitat for foxes. Foxes are much rarer in remote, closed forest habitats and wilderness. They are found in the majority of South Coast Region reserves.

Impacts

Foxes are known to predate on native fauna, including brush-tailed rock-wallabies, southern brown bandicoots, long-nosed potoroos and the eggs and chicks of several threatened shorebird species.

Foxes compete with native carnivores for food and shelter and are known to harbour and spread diseases, including sarcoptic mange and hydatids.

Priorities for control

Fox control is guided by the Fox Threat Abatement Plan (TAP) which aims to direct fox control to areas where impacts on threatened species are likely to be greatest and to ensure that fox control programs are effective in reducing such impacts (NPWS 2001). It shows which threatened species are at greatest risk from fox predation and at which sites fox control is most critical for threatened species.

Fox TAP sites are a critical priority and include:

- Kangaroo Valley site for BTRW
- Conjola, Jervis Bay, Murramarang and Seven Mile Beach NPs and Comerong Island NR for shore-nesting birds: little terns, pied oystercatchers and hooded plovers

- Barren Grounds NR site for long-nosed potoroos
- Dharawal reserves and Illawarra Escarpment SCA for broad-headed snake and endangered frog and mammal species.

Control

Ground baiting with 1080 baits and M44 ejectors is the most effective and efficient method used to control foxes. It is important to use a variety of bait types, ejector heads and baiting locations to maximise the effectiveness of a program. Leg-hold trapping can be used to trap bait-shy foxes or where distance restrictions cannot be met when using 1080. Den fumigation can be used only when the location of the den is known and at certain times of the year. Shooting and exclusion fencing are alternative methods of control and are best suited to specific sites and circumstances.

Monitoring

The Fox TAP outlines monitoring programs which measure the response of threatened species to fox control. Changes in fox activity will be monitored using sand pads placed across roads and tracks. At other sites, bait uptake rates will be used as a measure of changes in fox activity. In addition, remote cameras are now widely used throughout South Coast Region to monitor fox sites.

Feral deer (family Cervidae)

Distribution and abundance

Rusa deer (*Cervus timorensis*), red deer (*Cervus elaphus*), chital deer (*Axis axis*), sambar deer (Cervus *unicolor*) and fallow deer (*Dama dama*) occur in and adjacent to reserves in South Coast Region. The distribution and density of different species vary in areas due to limiting factors and time since their incursion. However, the range and abundance of some deer species appears to be increasing significantly. New occurrences of feral deer have been reported near all major towns and localities in the region.

Impacts

Herbivory and environmental degradation by feral deer is a KTP under the TSC Act. Deer are known to have a significant impact on freshwater wetlands, river flat forests, peatlands, swamplands and rainforests in South Coast Region. Overgrazing, trampling, wallowing, ring-barking, antler rubbing, erosion and dispersal of weeds are documented impacts of feral deer that could alter the composition and structure of endangered ecological communities (EECs).

Deer are also a significant threat to a number of EECs and rare plants in South Coast Region reserves including Illawarra Subtropical Rainforest EEC in the Illawarra Escarpment SCA, Illawarra Irene (*Irenepharsus trypherus*) in Budderoo NP and Illawarra Escarpment SCA and *Callitris endlicheri* in Dharawal NP. Feral deer are known to damage agricultural crops and fences and, like goats, are potential vectors for outbreaks of animal diseases.

Priority for control

- Collaborating in research to further investigate the ecology of deer and other forms of control techniques.

- Dharawal reserves and Illawarra Escarpment SCA for Callitris, upland swamps, shale/transition forests, moist forests including rainforest, *Callitris endlicheri.*
- Bimberamala NP.

Control

Ground-based shooting is the primary control method where there is vehicle access. In areas where there is no vehicle access, deer have been, and will continue to be, controlled opportunistically during aerial goat control programs.

Trapping at other locations has generally been unsuccessful but remains a potential control option during rutting in specific areas.

Monitoring

Deer will be monitored via direct and indirect observation during patrols conducted by rangers and field staff of South Coast Region.

The use of cameras has proved successful and will continue to be used as this monitoring has established data for new incursions of deer species in areas where they did not previously inhabit.

Satellite and GPS monitoring will be used to investigate the ecology and distribution of deer in South Coast Region reserves.

Rabbit (*Oryctolagus cuniculus*)

Distribution and abundance

Rabbits occur in low densities in most South Coast Region reserves and use a variety of habitats including warrens, fallen timber, areas of dense vegetation and other surface habitats.

Impacts

Competition and grazing by feral European rabbits is listed as a KTP under the TSC Act and the EPBC Act. Rabbits are a declared pest under the *Rural Lands Protection Act 1998*.

Rabbits change the structure and composition of native vegetation communities, compete with native fauna for food and shelter, and cause land degradation.

Priorities for control

Where rabbits have the potential to impact on threatened species or EECs or have a significant impact on adjacent agricultural production, these areas are a critical priority.

Control

Integrated and cooperative control for rabbits is essential for a successful program. The primary method of control for rabbits is baiting with either 1080 or Pindone, followed up by harbour destruction where necessary or possible.

Additional rabbit control methods include shooting, fumigation and biological control agents such as rabbit haemorrhagic disease (calicivirus).

Monitoring

Controlling rabbits in many areas is a continual process because of the potential for rabbits to move in from neighbouring areas and their high fecundity. As a result,

monitoring rabbit populations is essential for effective and sustained control so that control programs can target areas of reinfestation after primary control.

Feral goat (*Capra hircus*)

Distribution and abundance

Feral goats range through escarpment, gorge and plateau lands in the northern and north-western parts of South Coast Region including Bungonia SCA, Bungonia, Bangadilly, Tarlo, Morton and Budderoo NPs and Barren Grounds, Jerralong, Nadgigomar and Bees Nest NRs.

Impacts

Competition and habitat degradation by feral goats is a KTP under the TSC Act and the EPBC Act. Feral goats impact several EECs and many threatened plant and animal species, including broad-headed snakes (*Hoplocephalus bungaroides*) and BTRW.

Feral goats significantly impact biodiversity values, including threatened swamps and rainforests, and rare plant and animal populations. Goats are potential vectors for the spread of disease and may significantly impact on agricultural lands.

Feral goats have been known to damage Aboriginal occupation sites in escarpment caves and degrade wilderness and water catchment values.

Priority for control

- Escarpment lands in the northern Shoalhaven catchment to protect rainforest, including Budderoo and Morton NPs and Barren Grounds NR.
- Upper Shoalhaven River region, including Bungonia SCA and Bungonia NP.
- Key habitat areas to protect broad-headed snakes.
- Rock overhangs and caves to protect the large-eared pied bat (*Chalinolobus dwyeri*) and Aboriginal cultural values.
- Towards the lower parts of the Corang River to achieve control on private land to protect the pygmy cypress pine (*Callitris oblonga*).
- Illawarra Escarpment SCA at Mt Kembla and Maddens Plains.

Control

Aerial shooting is the primary and most effective control method used in remote, steep and inaccessible terrain. The long-standing NPWS aerial control program is enhanced by a cooperative approach with many adjacent land owners and managers. Opportunistic and ground-based shooting programs are also used and incorporated into control programs where possible.

Monitoring

Goat populations in South Coast Region reserves have been monitored via the fitting of GPS collars on individual animals. This assists in understanding their behaviour and distribution, to further enhance control programs.

Data from aerial programs and information from rangers and field staff will be used to monitor the performance of the control program. Where goats are controlled to aid the recovery of threatened species or communities, performance will be measured by monitoring the response of the threatened species or community concerned.

Feral pig (*Sus scrofa*)

Distribution and abundance

Feral pig populations occur in reserves and adjacent freehold land across South Coast Region, mainly in low and very low densities. Many of the affected sites have associated problems with illegal pig hunters that disturb control programs and introduce pigs into areas.

Impacts

Predation, habitat degradation, competition and disease transmission by feral pigs is a KTP under the TSC Act and the EPBC Act. Box Woodland, Montane Peatland, wetlands and Riverflat Eucalypt Forest EECs are degraded by feral pig activity. Feral pigs threaten water catchment values, may impact significantly on agricultural production and act as vectors for the spread of animal diseases. They kill or compete with many threatened birds, mammals and amphibian species. Stream-dependent threatened frogs are at particular risk from habitat damage by pigs.

Feral pigs can cause severe localised environmental damage by selective feeding on plant communities, weed dispersal, creation of drainage channels in swamps, soil erosion and fouling of watering points by wallowing and rooting (West and Saunders 2003).

Priorities for control

Any areas where feral pigs impact on threatened species or EECs, or impact significantly on agricultural production or human health, are a critical priority. Priority will also be given to new occurrences of feral pigs in the Region.

Control

Where possible, cooperative control programs will be encouraged as they enhance the efficiency and effectiveness of control programs. Trapping and 1080 baiting are the preferred methods of pig control. Feral pigs are opportunistically shot during aerial feral goat control programs.

Monitoring

Rangers and field staff will monitor pig activity through direct observation. Remote cameras and reports from the public and adjacent land managers will be used to determine where and when control is required.

Feral cat (*Felis catus*)

Distribution and abundance

Feral cats are found in most Australian environments, and in rural areas may be most abundant near rural residential and agricultural land. Feral cats are found throughout many South Coast Region reserves, though due to their cryptic nature they may often go unnoticed.

Impacts

Predation by feral cats is a KTP under the TSC Act and EPBC Act. Predation by feral cats has been implicated in the extinction and decline of many species of small mammals and birds on islands around Australia and on the Australian mainland.

Predation by feral cats impacts on many fauna species including threatened birds and mammals in South Coast Region reserves. Feral cats threaten eastern bristlebird (*Dasyornis brachypterus*) populations at Jervis Bay NP and Barren Grounds NR, little terns (*Sterna albifrons*) breeding on coastal reserves, striated fieldwrens (*Calamanthus fuliginosus*) at Murramarang and Morton NPs and the eastern pygmy-possum and ground-dwelling moist-forest fauna in the Illawarra. Feral cats may also predate on BTRW (*Petrogale penicillata*) and on southern brown bandicoots (*Isoodon obesulus*) when alternative prey is scarce or absent.

Other small mammals such as rodents, dasyurids, burramyids, ground-nesting birds, amphibians and reptiles are at particular risk.

Priority for control

1. Opportunistically control feral cats as part of shooting and trapping operations at Fox TAP sites as a critical priority.
2. Opportunistically control feral cats as part of shooting and trapping operations for wild dog programs.
3. Opportunistically control feral cats during goat and deer shooting programs.

Control

Specifically targeting cats in a control program can be an expensive exercise - both financially and temporally - though it is possible. Mostly cats are controlled opportunistically in other control programs such as dog or fox trapping programs, and aerial and ground shooting programs. Cage traps can be used with limited success, though soft-jaw trapping can be effective when undertaken by trained personnel.

Cats caught in traps will be humanely destroyed except for domestic cats clearly identifiable by their behaviour or a collar. Domestic cats will be taken to the nearest council animal shelter.

Monitoring

The success of feral cat control programs implemented for threatened species conservation will be assessed by measuring the response of the threaten species concerned. Other monitoring methods may include using remote cameras and sandplots.

Australian ravens (*Corvus coronoides*) and silver gulls (*Larus novaehollandiae*)

Distribution and abundance

The distribution of Australian ravens includes alpine regions up to 1500 m, agricultural landscapes, islands, beaches and rubbish dumps. Although a native species, Australian ravens are an unprotected species in the areas where they are impacting on shorebirds. Increasing numbers have been observed by NPWS staff, shorebird volunteers and local residents around shorebird nesting times.

The distribution of silver gulls covers the Australian continent, though the birds tend to congregate in populated areas. This coincides with food availability from garbage and scraps.

Impacts

Australian ravens and silver gulls predate on the chicks and eggs of shorebirds. On the South Coast, the recovery of local threatened shorebird populations is being impacted by frequent raven and silver gull predation. Species listed under the TSC Act include the critically endangered hooded plover, endangered migratory little tern, endangered pied oystercatcher and vulnerable sooty oystercatcher.

Australian raven and silver gull tracks have been witnessed around empty nests and the birds have been seen attempting to enter protective nest cages, loitering around nesting areas, harassing nesting shorebirds, checking suitable habitat for eggs or chicks, and with chicks in their beaks. They have also been filmed at predated nests on monitoring cameras. With less than 50 hooded plovers remaining in NSW, raven predation on hooded plover nests and chicks is seriously hampering the population's ability to recover. Furthermore, little terns are colonial nesting shorebirds and the impacts of raven and silver gull predation can be detrimental to the success of the entire colony for that breeding season, even causing abandonment of the nesting site.

In particular, the impacts of Australian raven predation are increasing as local raven populations increase, possibly due to the increased human population on the South Coast resulting in abundant food from rubbish, road kill, fishing bait and carcasses, and even hand feeding. It also appears that these intelligent birds associate the shorebird nesting area fencing with a food source. However, these fences remain necessary to protect eggs and chicks from disturbance and trampling by humans and dogs. Protective wire mesh nest cages also highlight the location of nests to predators. These cages may be used for hooded plover and little tern nests, but do not protect chicks once they leave the nest.

Priority for control

- Collaborating in research to further investigate the ecology of local populations of Australian ravens.
- Researching and trialling alternative forms of avian predator control, such as trapping and learned taste aversion.

Current priority areas for control

- Little tern: Lake Wollumboola, Lake Conjola, Windang and Lake Tabourie
- Hooded plover: Kioloa, Rennies and Pockets Beaches, Racecourse Beach, Lake Tabourie, Berrara Beach, Meroo Lake, Cudmirrah Beach, Inyadda Beach, Willinga Lake, Pretty to Dawsons Beach.

- Pied oystercatcher: Windang, Lake Conjola, South Durras, Lake Tabourie.
- Sooty oystercatcher: Brush and Belowla Island.

Control

Control of ravens and silver gulls has been attempted via a number of methods, including ground shooting and exclusionary nest caging, as well as trialling trapping and the use of avicides (alphachloralose).

Ground shooting of silver gulls appears quite effective as the birds appear to continually loiter in an area, and are consequentially easily removed. However, for the more intelligent Australian raven, to date, these methods have been largely unsuccessful.

Exclusionary nest caging causes problems through attracting other predators such as foxes to the nest, as well as humans who occasionally vandalise nests. Trapping of ravens has so far been unsuccessful. The avicide alphachloralose has been trialled twice in the Region with limited success.

Currently, South Coast Region is working with Shoalhaven City Council to further investigate raven control methods via a Caring for Our Country grant.

Monitoring

Australian raven and silver gull presence at nesting sites will be monitored via direct and indirect observation during patrols conducted by the NPWS shorebird recovery coordinator, rangers, field staff and shorebird volunteers of South Coast Region.

Chytridiomycosis

Distribution and abundance

Chytridiomycosis is a water-borne disease of amphibians caused by the parasitic chytrid fungus *Batrachochytrium dendrobatidis*. This disease is a global epidemic and the infection of frogs by amphibian chytrid causing the disease chytridiomycosis has been determined to be a KTP by the NSW Scientific Committee.

It is very likely that the chytrid fungus is ubiquitous throughout frog populations in South Coast Region.

Impacts

Not all frog species are at high risk of becoming infected and not all frogs die from the disease. In certain areas, those species at greatest risk have a strong association with streams (especially those that breed in permanent streams) rather than pond or terrestrial breeders (Kriger and Hero 2007). Queensland studies suggest that if frog populations can survive initial episodes of population decline, chytrid resistance should build up in the remnant population and it may recover (Berger et al. 1999).

Chytridiomycosis is known to kill the endangered green and golden bell frogs (*Litoria aurea*). The Shoalhaven region is a stronghold for this species but populations of these frogs in South Coast Region are considered to be at risk of the disease. Other stream-breeding threatened frogs in South Coast Region include the giant burrowing frog (*Heleioporus australiacus*), and the red-crowned toadlet (*Pseudophryne australis*) may also be susceptible.

Priorities for control

Chytridiomycosis has been detected in a remnant population of endangered stuttering frogs (*Mixophyes balbus*) at Macquarie Pass NP in 2004 and was believed

to be the cause of the decline of the population. It has been detected in the heath frog (*Litoria littlejohni*) populations in Morton and Jerrawangala NPs and Parma Creek NR (P. Craven, pers. comm.).

Control

- Promote and implement effective hygiene protocols.[4]
- Instigate threat abatement for key threatened species or populations including habitat modification, captive breeding programs, translocations and treatment of individuals.
- Continue to monitor frog populations where chytridiomycosis has been detected and collaborate with researchers to further understand the biology of the fungus and its impact on frogs.
- Support research into understanding species resistance to the fungus, both innate and acquired, to assess evolutionary responses and potentially improve the success of re-introduction programs.

Monitoring

Monitoring of key threatened frog populations will be undertaken to investigate transmission and dispersal of *B. dendrobatidis* to improve understanding of the disease.

Myrtle rust (*Uredo rangelii*)

Distribution and abundance

Myrtle rust is a plant disease caused by the exotic fungus *Uredo rangelii*. It has established in coastal NSW from the Clyde River north into Queensland. It is likely to spread rapidly to the extent of its biological range as the spores are dispersed readily by wind. Eradication is not feasible. Within South Coast Region, outbreaks have been recorded in the Illawarra at Stanwell Park and Mt Keira.

Impacts

Myrtle rust affects plants in the family Myrtaceae, including the genera *Eucalyptus, Angophora, Callistemon* and *Melaleuca*. Infection occurs on young growing shoots, leaves, flower buds and fruits. It produces masses of powdery bright yellow or orange-yellow spores on the infected areas. Leaves may become buckled and twisted, and die as a result of infection.

The likely impacts of myrtle rust on biodiversity in Australia are unknown. It may cause significant mortality among young plants, reducing recruitment into adult populations and contributing to the decline or extinction of species. This is of immediate concern for those species already at high risk, i.e. threatened species. Reduced recruitment may also have severe impacts on the structure and function of the many natural ecosystems that depend on Myrtaceae.

Introduction and establishment of exotic rust fungi of the order *Pucciniales* pathogenic on plants of the family myrtaceae is listed as a KTP under the TSC Act.

Priorities for control

The *Management Plan for Myrtle Rust on National Parks* outlines how myrtle rust will be managed on national park estate in NSW, including the potential impacts of myrtle

[4] www.environment.nsw.gov.au/resources/nature/hyprfrog.pdf

rust on threatened species. The plan also provides guidance to managers of other bushland and threatened species sites.

The objectives of the plan are to:

- slow the establishment of myrtle rust on national park estate
- minimise the impacts of myrtle rust on threatened species and ecological communities on national park estate.

Control

The *Management Plan for Myrtle Rust on National Parks* includes eight action areas to manage Myrtle Rust on NPWS estate:

1. Identify high value assets at risk.
2. Limit the spread of myrtle rust.
3. Monitor the spread of myrtle rust.
4. Manage infections.
5. Research the impacts of myrtle rust.
6. Training, extension and external communication.
7. Record the incidence of myrtle rust.
8. Liaise and report on the spread and impacts of myrtle rust.

Specific actions for South Coast Region are to:

- monitor, record and manage outbreaks in the Illawarra.
- monitor the source of mulch imported to and used in reserves.
- survey to determine the extent.

Monitoring

Presence/absence data will be entered into the Biological Survey Subsystem of the Wildlife Atlas from monitoring threatened species and sentinel sites.

If any fungicide control works are required, daily record sheets will kept for all control programs in accordance with the Pesticides Act. Before and after photos are also taken during the course of implementation of works. Where treatment is proposed, GPS locations will be taken of work site locations and records kept of the extent of myrtle rust distribution and control implemented. Sites will be revisited periodically for follow-up treatment and maintenance.

Serrated tussock (*Nassella trichotoma*)

Distribution and abundance

Within South Coast Region serrated tussock mainly occurs on the Southern Tablelands. In some areas near reserves, serrated tussock is locally prolific to the point of almost forming a monoculture. In Upper Nepean SCA, serrated tussock is present along many easements, particularly railway easements. Some reserves in South Coast Region contain small infestations of serrated tussock.

Impacts

Serrated tussock is listed as a WoNS. It is an aggressive invader of grassland and pasture areas. It seeds prolifically and is readily dispersed by wind, water, animals and human activity.

Invasion of native plant communities by exotic perennial grasses is a threat to many endangered ecological communities including Box Woodland at Bungonia SCA and Tarlo River NP. Dense infestations of serrated tussock may eliminate most other plant species, thereby reducing the biodiversity of an area, and be a harbour for reinfestation. The invasion of native plant communities by exotic perennial grasses (including serrated tussock) has been declared a KTP under the TSC Act.

Priorities for control

Priorities for control are to continue to limit the spread of existing populations while maintaining and enhancing existing programs in Bungonia NP, Bungonia SCA, Nadgigomar NR, McCallums Flat on the Shoalhaven River in Morton NP, and Upper Nepean SCA. High priority sites identified in the BPWW where serrated tussock is impacting threatened assets are a critical priority.

Control

Control is generally undertaken by spot or boom spraying with appropriate chemicals.

Aerial spraying has been utilised in the past in Morton NP and surrounding properties to control dense infestations. Most work is now undertaken via spot spraying. Control works are generally undertaken before September–December prior to flowering.

Where possible staff will undertake control activities in conjunction with programs implemented by neighbouring landholders, Landcare groups and councils. A Best Practice Control Manual has been prepared under the WoNS program for serrated tussock.

Monitoring

Monitoring will be undertaken by rangers and field staff so that an early response can be initiated should an infestation be detected. Yearly pre-work inspections of known infested areas will continue to be undertaken by staff and the work recorded.

Asparagus weeds

Asparagus weeds known to occur in South Coast Region reserves include bridal creeper (*Asparagus asparagoides*) and ground asparagus (*Asparagus aethiopicus*). Bridal creeper occupies a wide range of vegetation types and can invade and dominate undisturbed forest and riparian zones. Infestations are established in the Wollongong and Shoalhaven LGAs and the weed is steadily increasing in distribution towards the south. Ground asparagus is most abundant on coastal dunes and there is a large infestation in the Crown land adjacent to the northern end of Seven Mile Beach NP that is spreading into the park. South Coast Region has undertaken and is continuing control works to keep this infestation contained.

Impacts

Bridal creeper is a declared WoNS, and in 2012 all other exotic asparagus species were also listed. Many of these species are aggressive tree-climbing weeds that smother native ground vegetation, shrubs and small trees. Invasion and establishment of exotic vines and scramblers is listed as a KTP under the TSC Act. Asparagus species are a potential threat to rare species as they can colonise undisturbed ecosystems.

Ground asparagus is a major threat to littoral rainforest in coastal reserves.

Priorities for control

- Bridal creeper rust fungus release sites
- Conjola and Clyde River NPs
- Cullendulla Creek NRs
- Littoral rainforest in Seven Mile Beach NP and EECs at Comerong Island NR
- Yatteyattah NR
- Gooseberry Island and Hooka Island in Berkeley NR
- Narrawallee Beach, Narrawallee Creek NR

Control

The most effective method of control has been using herbicides, though this can be difficult to undertake if the weed is growing on native species. Generally, physical removal is not effective unless the rhizomes are removed and destroyed. CSIRO has successfully developed and implemented a biological control program using the leafhopper *Zygina* sp. and the rust fungus *Puccinia myrsiphylli.*

CSIRO rust and leafhopper release sites on the South Coast include Conjola and Murramarang NPs and Macquarie Pass SCA. There has also been bridal creeper dieback at Cullendulla Creek NR attributed to release of the rust fungus.

Monitoring

Bridal creeper and ground asparagus infestations will be recorded and mapped where work has been undertaken. Inspections will be conducted for several years after control is undertaken to monitor for any follow-up work that may be needed.

Rangers and field staff will inspect high priority sites regularly and continually monitor for new infestations so that an early response for control may take place. The Monitoring Manual for Bitou Bush Control and Native Plant Recovery can also be used to monitor response following management.

Lantana (*Lantana camara*)

Distribution and abundance

Lantana is prolific in coastal areas; however, the eastern escarpment of the Great Dividing Range appears to be a limiting factor in the spread of lantana to the western areas of South Coast Region under current climatic conditions. Lantana is an aggressive invader of disturbed forest and hind dunes but lantana is also common in undisturbed wet forest margins in South Coast Region reserves in the northern Shoalhaven catchments and the Illawarra area reserves. Where established it will rapidly dominate sites where the forest canopy has been opened up, such as the foothills and midslopes of the coastal ranges. In many localities in the northern Shoalhaven and Illawarra, lantana has spread hundreds of metres up steep terrain into reserves from cleared or disturbed land.

Impacts

Lantana is listed as a WoNS, and the invasion, establishment and spread of lantana is a KTP under the TSC Act.

Lantana is a threat to rainforests, coastal eucalypt forests and swamp forests. Infestations pose a threat to populations of the perennial herb *Typhonium eliosurum*

and other threatened plant species including the climber *Cynanchum elegans*, *Daphnandra* sp. *Illawarra* trees, Illawarra Irene (*Irenepharsus trypherus*), *Solanum celatum* shrubs and magenta lillypilly (*Syzygium paniculatum*). Lantana can rapidly smother ground vegetation and climb into the canopy, suppress natural regeneration at disturbed sites and alter ecological processes including fire regimes.

Priorities for control

High priority sites identified in BPWW where lantana is impacting threatened assets are a critical priority, as BPWW includes the priorities from the national Plan to Protect Environmental Assets from Lantana. The National Containment Zone for lantana is also located at Ulladulla. Priority sites for South Coast Region include:

- Minnamurra Rainforest in Budderoo NP
- Macquarie Pass NP
- Carama Inlet in Jervis Bay NP
- Seven Mile Beach NP, Comerong Island NR
- Bamarang NR
- Colymea SCA
- Bomaderry Creek RP
- Mt Keira portion at Keiraville and Mt Kembla portion in Illawarra Escarpment SCA
- Hooka Island in Berkeley NR
- Flat Rock Creek in Triplarina NR
- Clyde River NP
- Narrawallee Inlet in Narrawallee NR.

Control

Lantana will be controlled using manual, mechanical, chemical and biological control techniques. Herbicide application is not recommended when the infestation is under environmental stress (e.g. drought). A Best Practice Control Manual has been prepared under the WoNS program.

Lantana rust (*Prospodium tuberculatum*) has been released in many reserves of South Coast Region, including Bamerang NR, Triplarina NR, Cullunghutti AA and at Mt Keira in Illawarra Escarpment SCA.

Monitoring

Monitoring will involve periodic updating of weed maps, involvement with state-wide mapping inventory and periodic ground checking of high priority weed sites. Maintaining follow-up programs with inspections of treated areas and high risk areas, and inspecting known sites annually will also be undertaken. The Monitoring Manual for Bitou Bush Control and Native Plant Recovery can also be used to monitor the plant's response following the management of this weed.

Bitou bush (*Chrysanthemoides monilifera*)

Distribution and abundance

Bitou bush is found in coastal environments including Jervis Bay, Conjola and Seven Mile Beach NPs, and Comerong Island, Cullendulla Creek, Five Islands and Berkeley NRs.

There has been a long history of control in South Coast Region reserves, particularly in the Ulladulla area, where infestations are now isolated and dispersed.

Impacts

Bitou bush is a WoNS. Invasion by bitou bush is listed as a KTP under the TSC Act.

Bitou bush displaces and overgrows rainforest, coastal sclerophyll forests, grasslands, swamp forests and saltmarshes and impacts on threatened shorebirds dependent on these endangered ecological communities. Of particular concern is the impact of bitou bush on freshwater wetlands in Jervis Bay NP and on the perennial herb *Chamaesyce psammogeton* at Seven Mile Beach NP.

Priority for control

The national southern containment line for bitou bush is just south of Sussex Inlet. North of this line, high priority sites identified in BPWW where bitou bush is impacting threatened assets are a critical priority, as BPWW includes the priorities from the Bitou Bush TAP. These priorities are based on protection of threatened entities as follows:

- Seven Mile Beach NP, Jervis Bay and Conjola NPs (numerous sites) and Comerong Island NR for protection of littoral rainforest, Bangalay Sand Forest, Swamp Oak Floodplain Forest and SEPP 26 wetlands
- Seven Mile Beach and Jervis Bay NPs for protection of *Chamaesyce psammogeton*
- Jervis Bay NP for protection of swamp oak floodplain forest, freshwater wetlands and *Wilsonia backhousei*
- Cullendulla Creek NR and Tollgate Islands NR
- Gooseberry Island and Hooka Island in Berkeley NR
- Five Islands NR.

Other sites identified for control in South Coast Region reserves include Murramarang NP (south), Narrawallee Creek NR and Conjola NP.

Control

Bitou bush will be controlled using manual, mechanical, chemical and biological control techniques. A Best Practice Control Manual has been prepared under the WoNS program. Biological control will include using approved biological control agents (moth, beetle and fly species), and establishment of populations of the bitou leaf roller moth (*Tortrix* spp.) will be supported.

Bitou bush control is generally carried out as part of a coordinated program with adjacent landholders and other agencies.

Monitoring

Monitoring will involve maintaining a matched plot (bitou and native) monitoring system at Seven Mile Beach NP, periodic updating of weed maps, involvement with state-wide mapping inventory and periodic ground checking of high priority weed sites. The Monitoring Manual for Bitou Bush Control and Native Plant Recovery will be used to monitor the plant's response.

Sea spurge (*Euphorbia paralias*)

Distribution and abundance

Sea spurge is a recent coloniser of sandy beaches in the Shoalhaven and is now well dispersed along the coast from Lake Wollumboola southwards.

Populations of sea spurge occur on numerous beaches in South Coast Region reserves (Mills 1998). In Nowra Area, minor infestations of sea spurge occur between Currarong and Culburra beaches in Jervis Bay NP. In Ulladulla Area significant infestations occur on Richmond Beach and North Head Beach in Murramarang NP and minor infestations on various beaches including Island Beach, Dawsons Beach and Oakey Beach in the same park. In Conjola NP a significant infestation exists on Monument Beach and minor infestations occur on surrounding beaches. Narrawallee Creek NR contains a minor infestation on Buckleys Beach. Elsewhere in the Region sea spurge occurs on numerous beaches outside reserves.

Impacts

Sea spurge plants produce small, hard seeds that are tolerant of saltwater and can be spread widely by ocean currents. Several thousand seeds per year can be released by a single plant. Plants are long-lived and can form very extensive and densely growing populations that smother and outcompete local native beach plants. Sea spurge has the potential to threaten native plant and animal beach communities. Large populations of sea spurge may be detrimental to beach nesting shorebirds such as red-capped plovers, hooded plovers and pied oystercatchers. Such densely growing sea spurge may also be detrimental to recreational activities on beaches. The toxic milky sap of the plant may be a human health risk.

The spread of sea spurge is difficult to predict because beach and dune systems where the weed proliferates are dynamic systems subject to impacts from wind and waves. As a result, seeds can occur at various levels within the dune profile and can be exposed and/or transported in significant volumes over large distances.

Priority for control

The Southern Rivers Regional Weed Management Strategy has sea spurge as a category B weed in Eurobodalla and Lower Shoalhaven subregions and category A in the Illawarra subregion. Priorities are to reduce spread and to eradicate sea spurge in the Illawarra. The highest priority for control will be beach sites where sea spurge is impacting on threatened plants or shorebird protection activities, or the removal of isolated infestations to limit the spread including:

- beaches in South Coast Region reserves between Sussex Inlet and Bendalong
- Richmond and North Head Beaches in Murramarang NP
- Tollgate Island and Brush Island NRs.

Control

Sea spurge will be controlled by manual and chemical control techniques. Off-label permits for other effective chemical controls may be sought if necessary.

Monitoring

Monitoring for sea spurge will involve regular inspections of beaches in South Coast Region reserves. To aid this, photo points will be established at known infestation sites.

Crofton weed (*Ageratina adenophora*) and mistflower (*A. riparia*)

Distribution and abundance

These weeds are typically found in warm moist locations on the margins of rainforest and creek banks and are wide-spread throughout Illawarra Escarpment SCA where there are moisture seepages. The Nowra area is generally at the southern limit of their range and the weeds are found in South Coast Region reserves in the northern Shoalhaven catchment. These weeds can extend into wetlands.

Both species have a profuse display of white flower clusters in spring, Crofton weed having sticky white hairs whereas the floral hairs on mistflower are not sticky.

Impacts

Ageratina spp. impact on rainforest communities and populations of rare plants, including the perennial herb *Typhonium eliosurum*. They can dominate the ground cover in gullies and streambanks and may spread rapidly in moist, fertile and sheltered locations. High priority sites identified in BPWW where these weeds are impacting threatened assets are a critical priority.

Priority for control

- Shoalhaven River tributaries in Morton NP
- Seven Mile Beach NP
- Macquarie Pass NP, Clover Hill precinct
- Mistflower at Minnamurra rainforest in Budderoo NP
- Worrigee NR
- Mt Keira portion and Mt Kembla portion in Illawarra Escarpment SCA
- Gooseberry Island and Hooka Island in Berkeley NR.

Control

Ageratina spp. will be managed using manual and chemical control techniques. South Coast Region is also participating in biocontrol establishment of the white smut fungus (*Entyloma ageratina*). A biological control for mistflower, the common white smut fungus (*Entyloma ageratinae*), was released by CSIRO at sites within South Coast Region on 3–5 May 2011. This smut fungus has spread and has now been observed in South Coast Region reserves.

Monitoring

Rangers responsible for management of the area are to inspect high priority sites regularly and record and map Crofton weed and mistflower infestations. The Monitoring Manual for Bitou Bush Control and Native Plant Recovery can also be used to monitor the plant response at critical priority sites following management of these weeds.

Exotic perennial grasses

Distribution and abundance

The invasion of native plant communities by exotic perennial grasses is listed as a KTP under the TSC Act. Exotic perennial grasses occur in many Highlands Area reserves and a wide variety of exotic grasses are found in coastal areas, some of which are emerging problems for South Coast Region reserves. These grasses include Chilean needle grass (*Nassella neesiana*), African lovegrass (*Eragrostis curvula*), giant Parramatta grass (*Sporobolus fertilis*), whisky grass (*Andropogon virginicus*) and pampas grasses (*Cortaderia* spp.).

Buffalo grass (*Buchloe dactyloides*) and kikuyu (*Pennisetum clandestinum*) overgrow shorebird nesting sites on offshore island reserves, including Brush Island NR and Five Islands NR.

Impacts

Invasion of native plant communities by exotic perennial grasses is a threat to many EECs including Box Woodland EEC at Bungonia SCA and Tarlo River NP, and woodlands, grasslands and wetlands in coastal reserves. Terrestrial orchids, rare plants, birds and reptiles are also likely to be affected. High priority sites identified in BPWW where these weeds are impacting threatened assets are a critical priority. Another priority for the Region is to limit the spread of emerging exotic grasses such as pampas grasses (*Cortaderia* spp.) in Worrigee NR.

Priority for Control

Any areas where exotic perennial grasses impact on threatened species or EECs, or impact significantly on agricultural production or human health are a critical priority. Priority will also be given to new occurrences of exotic perennial grasses within the Region.

Control

Exotic perennial grasses will be controlled using manual and chemical control techniques. All-terrain vehicles and aerial spraying may be used to increase efficiency of control at established, remote and larger infestations.

Monitoring

Rangers responsible for the management area will undertake periodic ground checking of high priority weed sites, maintain follow-up programs with inspections of treated areas and high risk areas, and inspect known sites annually.

Exotic vines and scramblers

Distribution and abundance

Invasion and establishment of exotic vines and scramblers is listed as a KTP under the TSC Act. Exotic vines and scramblers are widespread and locally abundant in

natural environments in eastern NSW. The worst weed infestations occur on the margins of riparian zones, rainforest and in other sheltered, fertile and moist locations. These species pose particular threats to remnant or disturbed rainforest and wet sclerophyll communities. Exotic vines are characterised by the ability to dominate and smother understorey native plants, compete with and prevent germination by native plants, and disperse widely in fertile and riparian environments.

Exotic vines known to occur in South Coast Region reserves include Madeira vine (*Anredera cordifolia*), dolichos pea (*Dipogon lignosus*), Cape ivy (*Delairea odorata*), cat's claw creeper (*Macfadyena unguis-cati*), English ivy (*Hedera helix*), coastal morning glory (*Ipomoea cairica*), morning glory (*Ipomoea indica* and *Ipomoea purpurea*), Japanese honeysuckle (*Lonicera japonica*), moth vine (*Araujia sericifera*), passionfruit (*Passiflora* spp.), turkey rhurbarb or potato vine (*Acetosa sagittata*), black-eyed Susan (*Thunbergia alata*), trad (*Tradescantia fluminensis*) and periwinkle (*Vinca major*). In 2012, Madeira vine and cat's claw creeper became WoNSs.

Introduced vines and scramblers pose significant threats to the Illawarra moist forests and are generally prevalent along roads and the urban interface or where other disturbance and dumping of garden waste occurs. Turkey rhubarb infestations pose a threat to populations of the ROTAP perennial herb *Typhonium eliosurum* along the Shoalhaven River downstream of Tallowa Dam and on the Kangaroo River adjacent to Kangaroo River NR (BLS 2002). Trad is present in sheltered situations such as the rainforests at Back Run Creek and at the southeastern end of Apple Tree Flat on the Shoalhaven River in Morton NP, where it completely dominates the understory vegetation. High priority sites identified in BPWW where these weeds are impacting threatened assets are a critical priority.

Impacts

Exotic vines and scramblers threaten rainforests, swamp forests and tall open forests on fertile soils. Invasion and establishment of these weeds also directly threaten:

- *Cynanchum elegans* in Berkeley NR.
- *Pomaderris adnata* in Illawarra Escarpment SCA.
- *Irenepharsus trypherus* (preliminary) at Minnamurra rainforest and the escarpment of the Upper Kangaroo River in Budderoo NP, the banks of the Kangaroo River, the Jones Creek area in Morton NP and at Bees Nest NR
- *Daphnandra* sp. Illawarra at Minnamurra rainforest (preliminary assessment)
- long-nosed potoroos (*Potorous tridactylus*) at Budderoo and Conjola NPs and Barren Grounds and Cambewarra Range NRs (preliminary assessment)
- golden-tipped bats (*Kerivoula paupuensis*) at Bimberamala NP
- littoral rainforest in Seven Mile Beach NP
- EECs generally including subtropical rainforest communities and coastal swamp oak forest.

Some exotic vines and scramblers (e.g. *Tradescantia fluminensis* and *Vinca major*) form dense ground-cover carpets that suppress native species. In sclerophyll communities, exotic vines and scramblers are more mesic than native species and may change the nature of the fuel and thus alter fire regimes. Invasion by exotic vines and scramblers can also alter other biotic aspects of communities such as the abundance and diversity of plant-dwelling invertebrates (Ernst and Cappuccino 2005).

Priority for control

- Minnamurra Rainforest in Budderoo NP
- Established long-term control programs on the Shoalhaven River and its close tributaries in Morton NP
- Yatte Yattah NR
- Macquarie Pass NP including Clover Hill precinct
- Seven Mile Beach NP and Comerong Island NR
- Illawarra Escarpment SCA
- Cullendulla Creek NR
- Hooka Island and Gooseberry Island in Berkeley NR
- Hyams Beach in Jervis Bay NP
- Clyde River banks and islands in Clyde River NP.

Control

Control methods vary for different vines and scramblers. A combination of manual and chemical control techniques will be used.

Monitoring

Rangers responsible for the management will undertake periodic ground checking of high priority weed sites, conduct annual surveys of known exotic vine locations where threatened species occur, and progressively survey, map and monitor all weed infestations.

Willows (*Salix spp*.)

Distribution and abundance

All willows are widespread and associated with the gravel beds of rivers. Willows are known to occur in the riparian areas of Cecil Hoskins NR and Tarlo River NP. Willows also occur sporadically along the Shoalhaven River corridor in Morton NP.

Impacts

Willows are WoNSs and can significantly modify stream bank vegetation and hydrology in riparian environments. In streams, willows cause channel diversion, soil or bank erosion, loss of stream capacity, stream obstruction, increased flooding and loss of infrastructure. These impacts lead to degradations of water quality and stream health (Cremer et al. 1995).

Willows displace native vegetation and cause modifications to river flow that can lead to major stream-bank erosion, particularly during floods, and can have potentially adverse effects on aquatic fauna. If infestations increase they may threaten the conservation value of adjacent rainforest and other vegetation communities (BLS 2002). High priority sites identified in BPWW where these weeds are impacting threatened assets are a critical priority.

Priority for control

- Shoalhaven River corridor in Morton NP.
- Any areas where willows impact on threatened species or EECs are a critical priority. Priority will also be given to new occurrence of willows within the Region.

Control

Willows will be controlled using manual, mechanical and chemical control techniques. The main method for large trees will be stem injection with undiluted glyphosate during active growing months. A Management Guide has been prepared under the WoNS program.

Monitoring

Rangers responsible for management will undertake periodic ground checking of high priority sites and maintain follow-up programs with inspections of treated areas and high risk areas.

Appendix 1 New and emerging pest species

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.

Emerging pest species

New pest threats may emerge during the life of this strategy that require planning, control and monitoring. These threats may emerge as a result of accidental or deliberate release or escape of exotic animals and plants, adaptation by exotic species to new environments, adaptation by native species, climate change and habitat modification. Recent examples of new incursions of pest species into reserves are some deer species, in particular sambar deer (*Cervus unicolor*). Recent examples of native species becoming a pest are Australian ravens and silver gulls in relation to shorebird recruitment.

Where new pest incursions occur, early detection and eradication is the most cost-effective way to minimise the impacts. NPWS will work with other agencies to prevent the introduction of new pests and to respond rapidly when new incursions occur.

A general increase in mean temperatures and fewer frost days are predicted for the future climate of Australia. All invasive plants can be expected to demonstrate a southward range shift, and increased rainfall will spread weeds and temperature sensitive plants may shift into higher altitude areas (CRC 2007). However, climatic change may also assist the spread of some biological control agents and improve their effectiveness.

Some emerging pest threats have already been determined to be KTPs. Psittacine circoviral (beak and feather) disease is known to affect endangered *Psittacine* species and populations and may threaten local populations of gang-gang cockatoos (*Callocephalon fimbriatum*), glossy black-cockatoos (*Calyptorhynchus lathami*) and swift parrots (*Lathamus discolour*). Cane toads (*Bufo marinus*) and red imported fire ants (*Solenopsis invicta*) are other potential serious pest threats that require close monitoring. An increase in the rate of spread of some weed species may result from accidental or deliberate introduction of exotic large earth bumblebees (*Bombus terrestris*) from Tasmania where they are now established.

South Coast Region is aware of the need for monitoring and control activities to be sufficiently flexible to address not only potential new pest threats but also new incursions of existing threats from elsewhere within South Coast Region, e.g. the plant pathogen *Phytophthora cinnamomi,* myrtle rust and boneseed.

There is one known boneseed infestation on NPWS estate in South Coast Region. Boneseed is a WoNS. It is regarded as one of the worst weeds in Australia because of its invasiveness, potential for spread, and its economic and environmental impacts. Boneseed is an erect, perennial shrub which grows up to 3 m high, and reproduces by seed. It is relatively short lived (10–20 years) and has woody branched stems and oval shaped leaves with irregularly serrated edges. The seed is bone coloured when dry, hence the name boneseed. All boneseed programs are critical priority (C-NE) with an eradication aim.

In addition to this, if there are any water hyacinth infestations identified in NPWS reserves in South Coast Region then they will immediately become a critical priority (C-NE) with the aim of eradication. NPWS is in the process of developing surveillance tools for potential new weed incursions.

In some circumstances, new programs may be introduced, or priority programs extended to target pests where a control window of opportunity is identified, e.g. 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.

The Southern Rivers Regional Weed Management Strategy has identified a number of new and emerging weed species for this Region.[5]

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 species and climate change.

[5] www.idnwa.com.au/assets/Uploads/Final-Draft-Southern-Rivers-Regional-Weeds-Strategy2.pdf

Appendix 2 South Coast Region pest management plans

The South Coast Region Operations Plan is an annual plan that identifies corporate level actions and how they will be implemented in South Coast Region. There are a number of other plans that guide pest management on reserves in South Coast Region, such as reserve plans of management and recovery and threat abatement plans.

The following current Area and reserve level planning documents describe in detail the on-ground works required to implement regional objectives:

- Berkeley Nature Reserve Introduced Weed Species Management Plan
- Berkeley Nature Reserve Weed Management Plan
- Bomaderry Creek Regional Park Weed Management Plan
- Budderoo NP (Minnamurra Rainforest and Budderoo Plateau) Weed Management Strategy
- Budderoo NP (Kelly's Cottage Precinct) Weed Management Strategy
- Colymea SCA, Bamarang NR and Wogamia NR Weed Management Plan
- Comerong Island NR Weed Management Plan
- Cullendulla Creek NR Weed Management Strategy
- Cumberland LHPA Northern Illawarra Deer Management Strategy
- Jervis Bay NP and Woollamia NR Weed Management Plan
- Macquarie Pass NP (Clover Hill Precinct) Weed Management Strategy
- Morton NP Heritage and Weed Management Assessment (Timealong Precinct)
- Morton NP (Shoalhaven River Corridor) Weed Management Plan
- Murramarang AA and Brush Island NR Weed Management Strategy
- Nadgigomar NR Weed Management Strategy
- Seven Mile Beach Weed Management Plan
- Tarlo River NP Weed Management Strategy.

Appendix 3 Regional coordination and support of pest control programs

Pest control programs are coordinated by the local NPWS areas and regional office in order to ensure that resources are used to achieve the best possible outcomes. Area and regional assistance is also required to efficiently work with neighbours, community groups and other agencies. Education of staff and the broader community is an essential requirement in integrated pest management and is also best achieved by centralised coordination.

South Coast Region will continue to implement systems for pest program reporting and monitoring. South Coast Region has a permanent regional pest management officer to provide support for Area pest management planning and program implementation. This assistance will include evaluating management plans, disseminating information and major program planning.

An important objective for South Coast Region is to provide support for community-based volunteer groups who carry out pest management activities on reserves under the supervision of NPWS staff and on private property as part of NPWS threatened species conservation programs. Some of these groups include:

- Friends of the BTRW, who help to conserve local populations of this threatened species by raising funds, conducting fox control and protecting BTRW habitat on private land
- Robertson Environment Protection Society, whose members work to protect and enhance the natural environment in and around the Robertson area, including Robertson NR
- Upper Minnamurra Rivercare Group, comprised of local rural residents working on riparian restoration projects near the Minnamurra rainforest in Budderoo NP
- Friends of Durras, volunteers who carry out weed control and monitoring of shorebirds on the Murramarang NP coastline; the main focus of the group's work is control of bitou bush, sea spurge and senna
- volunteers at various locations who assist with shorebird protection works, especially during the summer breeding season; work includes erecting and maintaining protective fences and signs around breeding sites, monitoring nesting sites, recording breeding information and talking to the public to raise awareness and understanding
- Conservation Volunteers Australia, who carry out a regular program of water quality monitoring, tree planting, bush regeneration, seed collection and propagation and photopoint monitoring at Seven Mile Beach NP.

All feral animal control will be carried out in accordance with the NSW DPI Vertebrate Pest Control Manual, the Feral Animal Aerial Shooting Team Guidelines and the DEH and DPI Codes of Practice and Standard Operating Procedures for Humane Pest Animal Control.

Appendix 4 Noxious weeds as at June 2012

The *Noxious Weeds Act 1993* provides for the identification, classification and control of noxious weeds in NSW. As noxious weed listings change refer to the DPI website for up to date listings.[6]

Weed Control Order No. 28 (30/9/2011) specifies the control objectives for the management of noxious weeds as follows:

Weed control class 1 - prevent the introduction and establishment of those plants in NSW.

Weed control class 2 - prevent the introduction and establishment of those plants in parts of NSW.

Weed control class 3 - reduce the area and the negative impact of those plants in parts of NSW.

Weed control class 4 - minimise the negative impact of those plants on the economy, community or environment of NSW.

Weed control class 5 - prevent the introduction of those plants into NSW, the spread of those plants within NSW or from NSW to another jurisdiction.

Control Class 1 and 2 weeds are a critical priority within this regional pest management strategy and those found across South Coast Region are listed below. In addition, noxious weeds under the other classes or other weeds not listed under this Act that are a risk to threatened assets and are a high priority in BPWW are also a critical priority in the regional pest management strategy.

Schedule 1 – Class 1 noxious weeds

Throughout NSW, these plants must be eradicated from the land and the land must be kept free of the plant.

Common name	**Scientific name**
Anchored Water Hyacinth	*Eichhornia azurea*
Black Knapweed	*Centaurea nigra*
Broomrapes	*Orobanche* species except the native *O. cernua* var. *australiana* and *O. minor*
Chinese Violet	*Asystasia gangetica* subspecies *micrantha*
Eurasian Water Milfoil	*Myriophyllum spicatum*
Hawkweed	*Hieracium* species
Heteranthera/Kidneyleaf mud plaintain	*Heteranthera reniformis*
Horsetail	*Equisetum* species
Hydrocotyl/ Water pennywort	*Hyrocotyle ranunculoides*
Hymenachne	*Hymenachne amplexicaulis*

[6] www.dpi.nsw.gov.au/agriculture/pests-weeds/weeds/profiles

Karoo Thorn	*Acacia karroo*
Kochia	*Bassia scoparia* except *B. scoparia* subspecies *trichophylla*
Koster's curse/ Clidemia	*Clidemia hirta*
Lagarosiphon	*Lagarosiphon major*
Mexican Feather Grass	*Nassella tenuissima*
Miconia	*Miconia* species
Mikania	*Mickania micrantha*
Mimosa	*Mimosa pigra*
Parthenium Weed	*Parthenium hysterophorus*
Pond Apple	*Annona glabra*
Prickly Acacia	*Acacia nilotica*
Rubbervine	*Cryptostegia grandiflora*
Senegal Tea Plant	*Gymnocoronis spilanthoides*
Siam Weed	*Chromolaena odorata*
Spotted Knapweed	*Centaurea stoebe* *Subspecies micranthos*
Water Caltrop	*Trapa* species
Water Lettuce	*Pistia stratiotes*
Water Soldier	*Stratiotes aloides*
Witchweed	*Striga* species except native species and *Striga parviflora*
Yellow Burrhead	*Limnocharis flava*

Schedule 2 – Class 2 Noxious Weeds

The plant must be eradicated from the land and the land must be kept free of the plant.

Common name	**Scientific name**	**Area**
Alligator Weed	*Alternanthera philoxeroides*	Whole of NSW except the local authorities listed by name in Schedule 3 of the Order for this species
Boneseed	*Chrysanthemoides monilifera* sub species *monilifera*	Whole of NSW except the local authorities listed by name in Schedule 4 of the Order for this species
Cape Broom	*Genista monspessulana*	Palerang Council, Eurobodalla SC
Gorse	*Ulex europaeus*	Eurobodalla SC

Hygrophila	*Hygrphila costata*	Campbelltown CC, Wollondilly SC
Mesquite	*Prosopis species*	Upper Lachlan SC
Parkinsonia	*Parkinsonia aculeata*	Upper Lachlan SC
Salvinia	*Salvinia molesta*	Whole of NSW except the local authorities listed by name in Schedule 3 of the Order for this species
Tropical soda apple	*Solanum viarum*	Whole of NSW except the local authorities listed by name in Schedule 3 of the Order for this species
Water Hyacinth	*Eichhornia crassipes*	Whole of NSW except the local authorities listed by name in Schedule 3 and 4 of the Order for this species

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