

State of the catchments 2010

# Invasive species

## Lachlan region

### State Plan target

By 2015 there will be a reduction in the impact of invasive species.

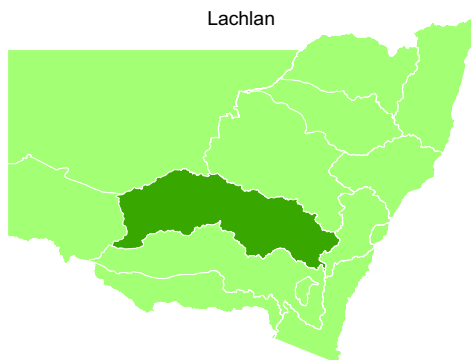
### Background

'Invasive species' is the collective term used to describe weed, pest animal, aquatic pests or invertebrate pest species. These species have been assessed as likely to have significant impacts – or are already impacting significantly – on the environment, production, human health or amenity. Invasive species impact (act as a pressure) on natural resource condition.

A detailed technical report describes the methods used to derive the information contained in this report. At the time of publication of the *State of the catchments (SOC) 2010* reports, the technical reports were being prepared for public release. When complete, they will be available on the I&I website: [www.industry.nsw.gov.au/info/mer](http://www.industry.nsw.gov.au/info/mer).

**Note:** All data on natural resource condition, pressures and management activity included in this SOC report, as well as the technical report, was collected up to January 2009.


## Map of the catchment



## Assessment

### Pressures

#### *Invasive species' impact as a pressure on biodiversity themes*







Overall assessment across indicators	Trend	Confidence
 Moderate	?	Medium

The overall assessment is an average of the three indicators: new, emerging and widespread.

While not all invasive species are monitored across New South Wales, these indicators represent some of the highest impacting species. The level of impact assessment (moderate) is unlikely to change in the short term, but the trend for overall impact of the species monitored can show the level of success of invasive species management to exclude and eradicate new threats, protect biodiversity at selected sites from established invasive species, and lessen the negative socio-economic impacts of established invasive species.

**Table 1 Indicator summary**

	Pressure	Baseline data	New data	Trend	Confidence
<b>New invasive species</b>				?	M
Weeds		2		?	M
<b>Emerging invasive species</b>				?	M
Freshwater pests		4		?	H
Pest animals		1		?	M
Weeds		19		?	M
<b>Widespread invasive species</b>				?	M
Freshwater pests		53.56%		?	H
Wild dog losses		634		?	L

Pressure	Trend	Data confidence
 Very low	↑ Increasing	H High
 Low	↔ No change	M Medium
 Moderate	↓ Decreasing	L Low
 High	?	
 Very high		
 No data		

## ***New invasive species***

### *Indicator 1 – Number of new invasive species; definitions and measurement*

New invasive species are any introduced species that have not been recorded in NSW previously and whose impacts are likely to be significant; alternatively they are species previously recorded in NSW that have since exhibited invasiveness.

This indicator is measured as the change in number of new invasive species in the region relative to the number reported 12 months previously. Table 1 shows baseline data only, as recorded at the date of this first report. Data is being collected on new priority weeds, new pest animals and new freshwater pests.

### **Freshwater pests**

There are no new freshwater pest species reported in the Lachlan region.

### Pest animals

There are no new pest animal species reported in the Lachlan region.

### Weeds

There are two new weed species reported in the Lachlan region.

**Table 2 New weed species reported in the Lachlan region by local government**

Scientific Name	Common Name
<i>Hyparrhenia hirta</i>	coolatai grass
<i>Phyllostachys</i> spp.	rhizomatous bamboo

### Emerging invasive species

*Indicator 2 – Distribution and abundance of emerging invasive species; definitions and measurement*

An emerging species is a newly established species whose distribution and abundance is increasing.

This indicator is the net change in species trends. For example, 34 species increasing distribution and abundance compared to 11 species decreasing equates to a net increasing trend for this indicator. Data is being collected on emerging priority weeds, emerging pest animals and emerging freshwater pests.

### Freshwater pests

There are four emerging freshwater pest species reported in the Lachlan region.

**Table 3 Emerging freshwater pest species reported in the Lachlan region by Industry & Investment NSW (I&I)**

Scientific Name	Common Name
<i>Carassius auratus</i>	goldfish
<i>Oncorhynchus mykiss</i>	rainbow trout
<i>Perca fluviatilis</i>	redfin perch
<i>Salmo trutta</i>	brown trout

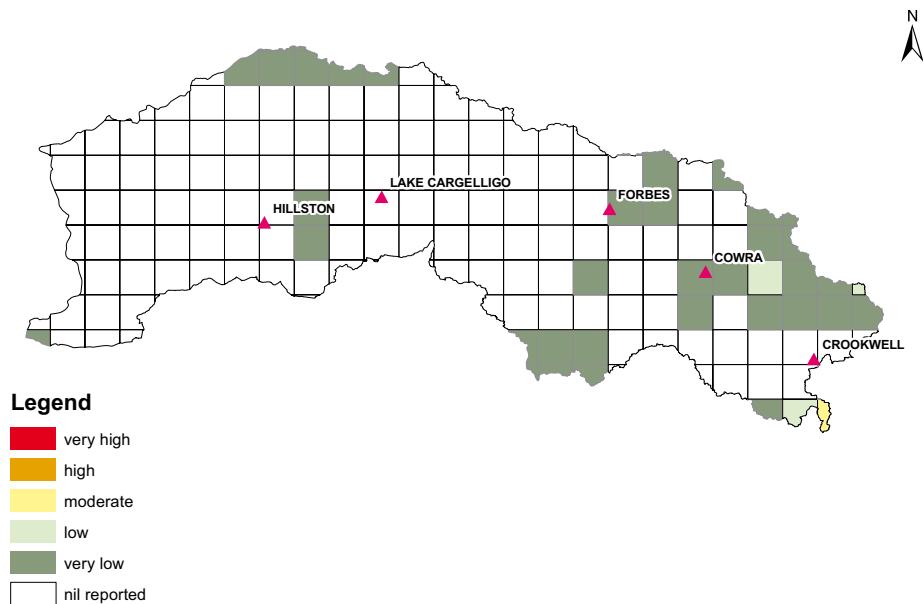
### Pest animals

There is one emerging pest animal species reported in the Lachlan region.



**Table 4 Emerging pest animal species reported in the Lachlan region by Livestock Health and Pest Authorities (LHPAs)**

Scientific Name	Common Name
<i>Dama, Cervus, Axis</i> spp.	feral and wild deer



**Figure 1 New and emerging pest animal index (aggregation of pest animal data for indicators 1 and 2)**

The pest animal index is measured by adding the density scores (Table 5) for all pest animals monitored for each grid square. Species monitored are camels, horses, donkeys, deer and cane toads.

The index classes are:

Very high	8–10
High	6–7
Moderate	4–5
Low	2–3
Very low	1

**Table 5 Density classes for pest animal and weed scores**

Density classes	Score	Density
Present-occurrence unknown	1	?
Occasional and localised	1	<1%
Occasional and widespread	2	1% to 10%
Common and localised	3	11% to 50%
Common and widespread	4	11% to 50%
Abundant and localised	5	>50 %
Abundant and widespread	6	>50 %

### Weeds

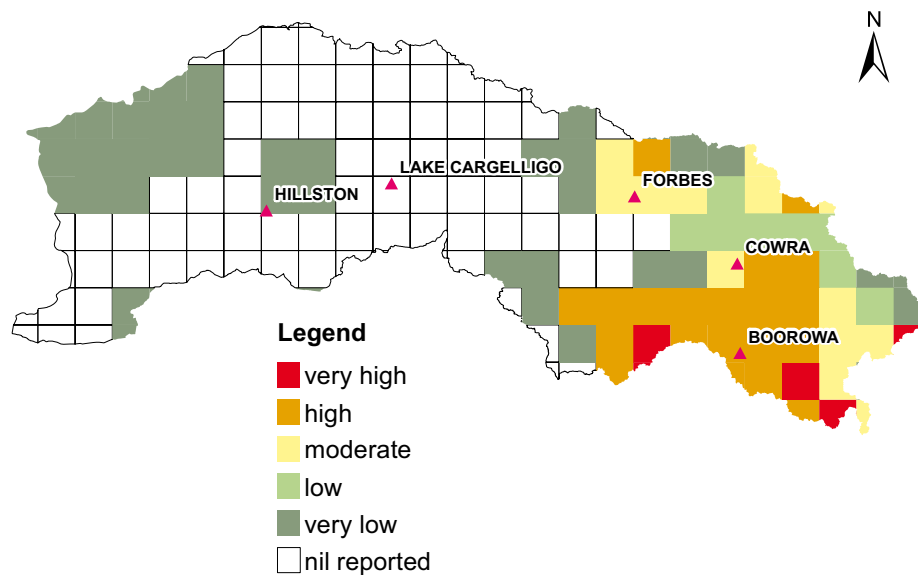
There are 19 emerging weeds reported in the Lachlan region.

**Table 6 Emerging weeds reported in the Lachlan region**

Scientific Name	Common Name
<i>Alhagi maurorum</i>	camel thorn
<i>Arundo donax</i>	giant reed/elephant grass
<i>Bryophyllum</i> spp. and hybrids	mother-of-millions
<i>Cestrum parqui</i>	green poisonberry/green cestrum
<i>Chrysanthemoides monilifera</i>	boneseed
<i>Genista monspessulana</i>	montpellier broom/cape broom
<i>Harrisia</i> spp.	harrisia cactus/apple cactus
<i>Ipomea indica</i>	morning glory (purple)
<i>Lonicera japonica</i>	Japanese honeysuckle
<i>Moraea</i> spp.	cape tulips
<i>Nassella neesiana</i>	Chilean needle grass
<i>Pennisetum setaceum</i>	fountain grass
<i>Pennisetum villosum</i>	long-style feather grass



Scientific Name	Common Name
<i>Physalis virginiana</i>	perennial ground cherry
<i>Pyracantha</i> sp.	firethorn
<i>Salpichroa origanifolia</i>	pampas lily of the valley
<i>Sorghum x almum</i>	Columbus grass
<i>Ulex europaeus</i>	gorse
<i>Vachellia farnesiana</i>	mimosa bush



**Figure 2 New and emerging weeds index (aggregation of weeds data for indicators 1 and 2)**

The index is measured by adding the density scores (see Table 5) for all weeds monitored for each grid square. There were 134 priority weed species mapped across NSW.

The index classes are:

Very high	12+
High	7–11
Moderate	4–6
Low	3
Very low	1–2

### Widespread invasive species

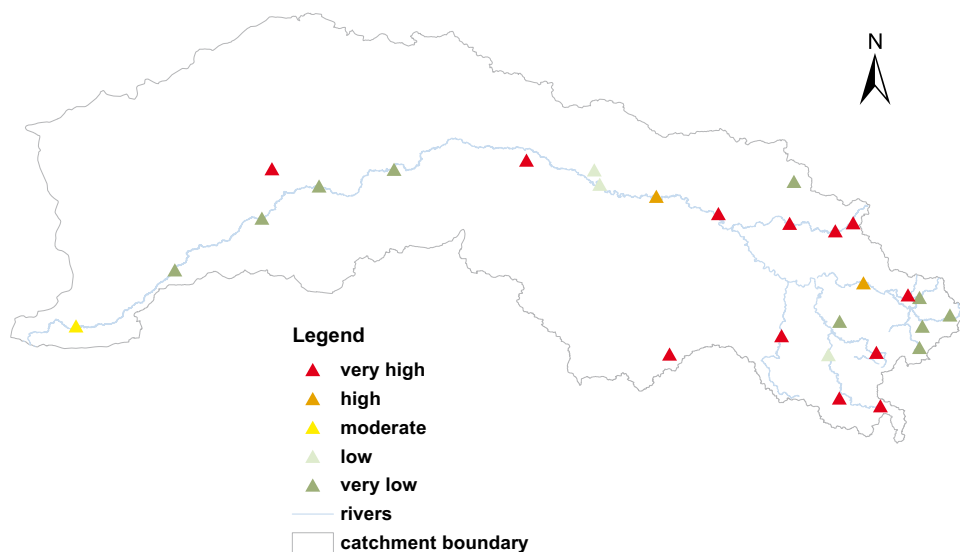
#### Indicator 3 – Impact of widespread invasive species at priority sites; definitions and measurement

A widespread species is any species widely distributed in NSW.

This indicator is measured by the change in impact of all the widespread pest species monitored. Data is being collected on the change in impacts of foxes on threatened species at priority sites and bitou bush on threatened plant species at priority sites, the number of stock losses attributed to wild dogs, and the number of alien fish as a percentage of total fish at sampling sites.

#### Freshwater pests

Data on freshwater pests is being collected by I&I. The freshwater sampling provides data for an indicator measuring the impact of alien fish (non-native fish) on native fish. The indicator is measured as the percentage of alien fish counted as part of the total catch at a particular site. The average of all site indicators in the Lachlan region is 53.56 per cent.



**Figure 3 Alien fish percentage in the Lachlan region**

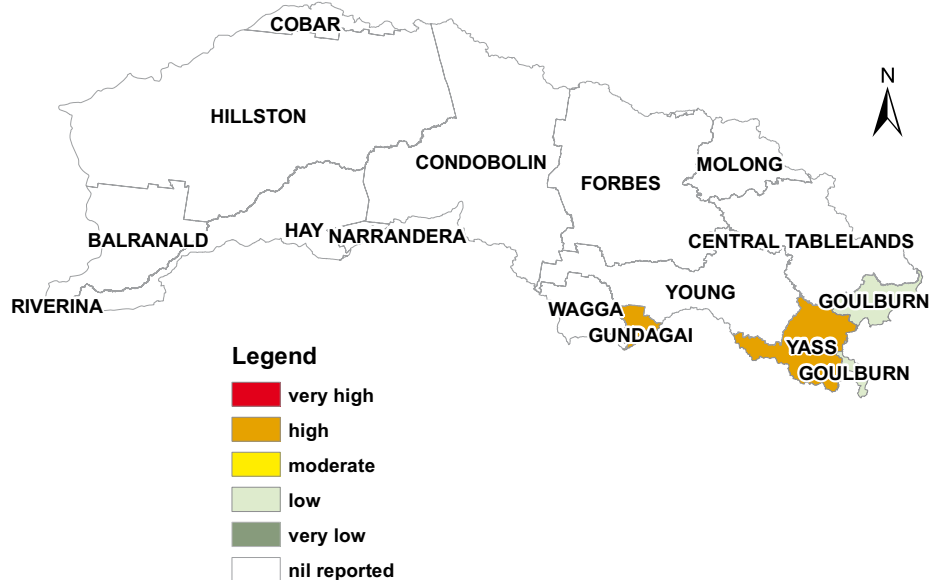
The indicator classes are:

Very high	81% to 100%
High	61% to 80%
Moderate	41% to 60%
Low	21% to 40%
Very low	0% to 20%



### Wild dog stock losses

In the Lachlan region, there were 634 stock losses attributed to wild dogs reported to I&I during the period 2004–2007.



**Figure 4 Wild dog stock losses in the Lachlan region**

The indicator classes are:

Very high	>1000
High	301–1000
Moderate	151–300
Low	51–150
Very low	1–50

### Fox Threat Abatement Plan (Fox TAP)

The NSW Threat Abatement Plan for predation by the red fox (Fox TAP) establishes priorities for fox control for the conservation of biodiversity across NSW. In particular, the plan identifies which threatened species are most likely to be impacted by fox predation and the sites at which these impacts are predicted to be most critical. In addition, the plan includes monitoring programs to measure the response of priority threatened species to fox control at these sites.

**Table 7 Threatened species protected in the Lachlan region by fox control**

Threatened species	Population numbers at fox control sites
malleefowl	analyses incomplete

## Management activity

### State level

The invasive species target is being addressed at the state level by the implementation of the NSW Invasive Species Plan. The plan aims to prevent the introduction of new invasive species, eradicate or contain new incursions that have established and to implement control programs to reduce the impacts of widespread species at priority sites.

Some of the state level initiatives include:

- protection and control, including:
  - protecting environmental assets from widespread weeds; prioritising environmental assets at risk from widespread weeds and sites for control in the Lachlan region. A draft plan for the Lachlan region is being developed to guide investment until 2015
  - participating in a national effort to control *Salvinia molesta*, one of the 20 weeds of national significance. I&I is hosting the Salvinia National Coordinator and staff are rearing the weevil that acts as a biological control (bio-control) agent
  - bio-control of Patterson's curse
  - a lantana rust bio-control project
  - implementing strategic fencing in national parks to manage feral goats
  - a serrated tussock coordination project
  - pest animal regional strategies (pest plan)
- best management practice for:
  - alligator weed
  - cabomba
  - dryland cropping systems (weeds)
  - regional fox control
- education, including:
  - 'Weed Warriors' schools project
  - 'What does your garden grow?' community capacity project
  - I&I courses on topics such as vertebrate pest management and planning for pest management – for more information go to [www.dpi.nsw.gov.au/agriculture/profarm/courses](http://www.dpi.nsw.gov.au/agriculture/profarm/courses)
- research, including:
  - an early detection program for aquatic weeds
  - herbicide resistance in the northern grain cropping belt
  - vine weed research project (cats claw creeper and madeira vine)
  - South East NSW and Australian Capital Territory wild dog project
  - assessing the risks of wild deer in NSW
  - causes in variation of the rabbit haemorrhagic disease virus in wild rabbit populations
  - commercial use of pest animals (production and conservation values)
  - modelling management options for camels



- a scoping study for the release of sterility agents for foxes and rabbits
- improving the management of Australia’s pest birds
- monitoring, evaluation and reporting (MER), through:
  - state of the catchments (SOC) reports – invasive species data collection
  - SOC MER data collected as support to the DECCW’s state of the environment report
  - a service for the ongoing identification of invasive weed species provided by the Botanic Gardens Trust. It regularly records new invasive species introductions to NSW and the extension of ranges of particular weed species
  - Fox TAP; the monitoring of biodiversity and foxes in response to fox control at priority sites. Priority sites in the Lachlan region include lands in and surrounding Nombinnie, Round Hill and Yathong nature reserves. The biodiversity response is being analysed as part of the review of the Fox TAP
  - estimating feral goat numbers.

## **Regional level**

At the regional level, the Lachlan Catchment Management Authority (CMA) is undertaking the following activities in relation to the invasive species target:

- the Lachlan River carp control project, including the development of a carp management plan. Carp populations are being reduced by targeting breeding locations using mechanical control and harvesting technology. This will result in an increase in aquatic biodiversity and will improve water quality in carp impacted areas. A component of the project will identify the contribution of priority wetlands to the overall carp population using otolith (granule in the inner ear) microchemistry analysis
- the Belubula River restoration project to improved riverine ecosystems along approximately 31 km of the Belubula River. This includes the poisoning and removal of willow species within the bed and banks of streams; fencing of riparian areas where willows have been removed; and revegetation using endemic native trees and shrub understorey species
- the Boorowa River recovery project, which has restored about 58 km of stream banks in the upper Boorowa River catchment through incentive funding for willow control, fencing and revegetation
- the integrated environmental weed management strategy project, including the formation of a reference group, to undertake projects and coordinate efforts to reduce weeds that impact adversely on known areas of high value biodiversity assets in both private and public lands. This involves facilitating collaborative partnerships with LHPAs, the DECCW, weeds councils, councils, Landcare and Forests NSW
- the animal pest management project, including the development of a pest management strategy for the Lachlan region and the formation of a reference group to facilitate collaborative partnerships that will improve the control of priority pest animals.

## **Local level**

There are a number of other groups undertaking significant work in the region that is contributing to better outcomes for invasive species management. These groups include:

- the landholders/primary producers within the region

- Aboriginal communities
- community groups (including Landcare)
- local councils and urban communities
- educational institutions including universities, TAFE and schools.

## Further reading

McNaught I, Thackway R, Brown L & Parsons M 2006, *A field manual for surveying and mapping nationally significant weeds*, Bureau of Rural Sciences, Canberra, [[www.weeds.org.au/docs/Weeds\\_Manual.pdf](http://www.weeds.org.au/docs/Weeds_Manual.pdf)].

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Natural Resources Commission 2005, *Recommendations, state-wide standards and targets*, [[www.nrc.nsw.gov.au/content/documents/Recommendations%20-%20State-wide%20standard%20and%20targets%20May%202005.pdf](http://www.nrc.nsw.gov.au/content/documents/Recommendations%20-%20State-wide%20standard%20and%20targets%20May%202005.pdf)].

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