State of the catchments 2010

Invasive species

Western region

State Plan target

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

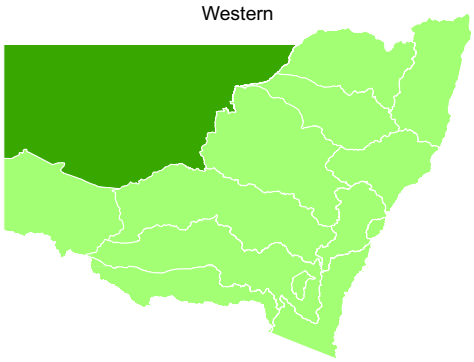
Background

'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.

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
New invasive species				?	M
Weeds		2		?	M
Emerging invasive species				?	M
Pest animals		2		?	M
Weeds		18		?	M
Widespread invasive species				↓	M
Foxes			decreasing	↓	M
Freshwater pests		16.08%		?	H

Pressure

1	2	3	4	5
very high	high	moderate	low	very low

No data

Trend

↑ Increasing

↔ No change

↓ Decreasing

? Unknown

Confidence

H High

M Medium

L Low

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 Western region.

Pest animals

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

Weeds

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

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

Scientific Name	Common Name
Parthenium hysterophorus	parthenium weed
Pereskia aculeata	leaf cactus

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 no emerging freshwater pests reported in the Western region.

Pest animals

There are two emerging pest animal species reported in the Western region.

Table 3 Emerging pest animal species reported in the Western region by Livestock Health and Pest Authorities

Scientific Name	Common Name
Equus asinus	donkeys
Dama, Cervus, Axis spp	feral and wild deer

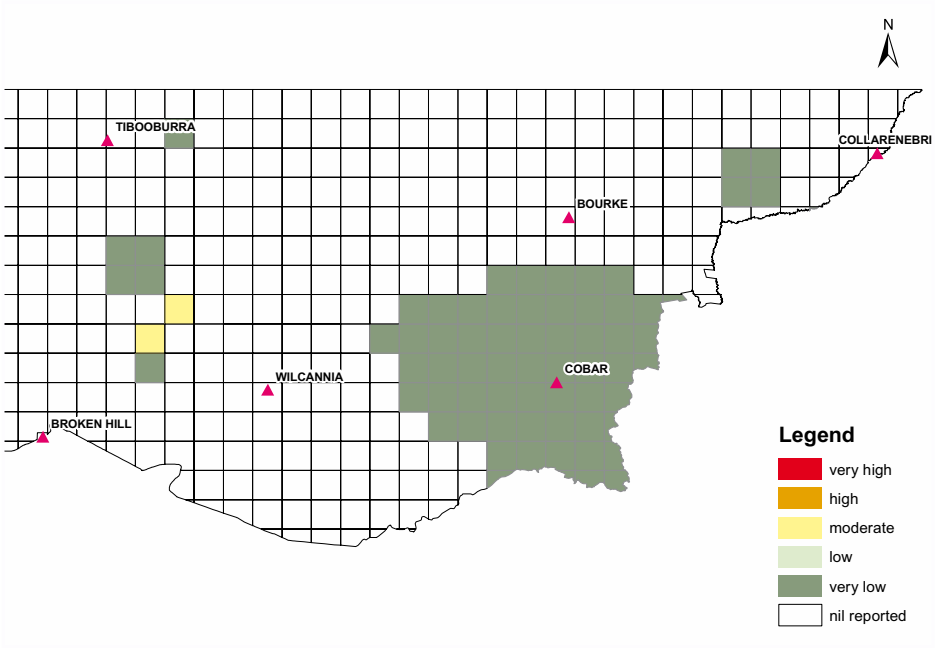


Figure 1 New and emerging pest animal index (aggregation of pest animal data for indicators 1 and 2)

The pest animal index is measured by adding the density scores (Table 4) 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 4 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 18 emerging weeds reported in the Western region.

Table 5 Emerging weeds reported in the Western region

Scientific Name	Common Name
Alhagi maurorum	camel thorn
Araujia sericifera	moth plant/moth vine
Bryophyllum spp. and hybrids	mother-of-millions
Cestrum parqui	green poisonberry/green cestrum
Chrysanthemoides monilifera	boneseed
Conium maculatum	hemlock
Harrisia spp.	harrisia cactus/apple cactus
Heliotropium amplexicaule	blue heliotrope
Parkinsonia aculeata	Parkinsonia
Pennisetum setaceum	fountain grass
Pennisetum villosum	long-style feather grass
Phyla spp.	lippia
Prosopis spp.	mesquite
Salpichroa origanifolia	pampas lily of the valley
Solanum elaeagnifolium	silver-leaf nightshade
Sorghum halepense	Johnson grass
Sorghum sp. hybrid cultivar	silk forage sorghum
Tamarix spp.	athel pine

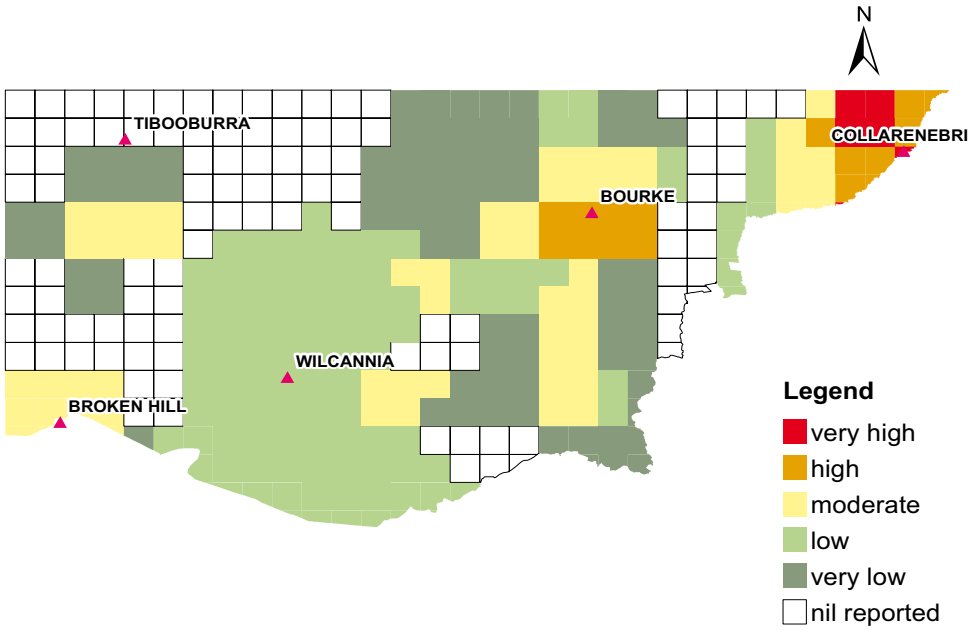


Figure 2 New and emerging weeds index (aggregation of weeds data for indicators 1 and 2)

The index is measured by adding the density scores (see Table 4) 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 the number of alien fish as a percentage of total fish at sampling sites.

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 6 Threatened species protected in the Western region by fox control

Threatened species	Population numbers at fox control sites
yellow-footed rock wallaby	increasing

The net result for the threatened species is a decrease in the impact of foxes at priority sites.

Freshwater pests

Data on freshwater pests is being collected by Industry & Investment NSW (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 Western region is 16.08 per cent.

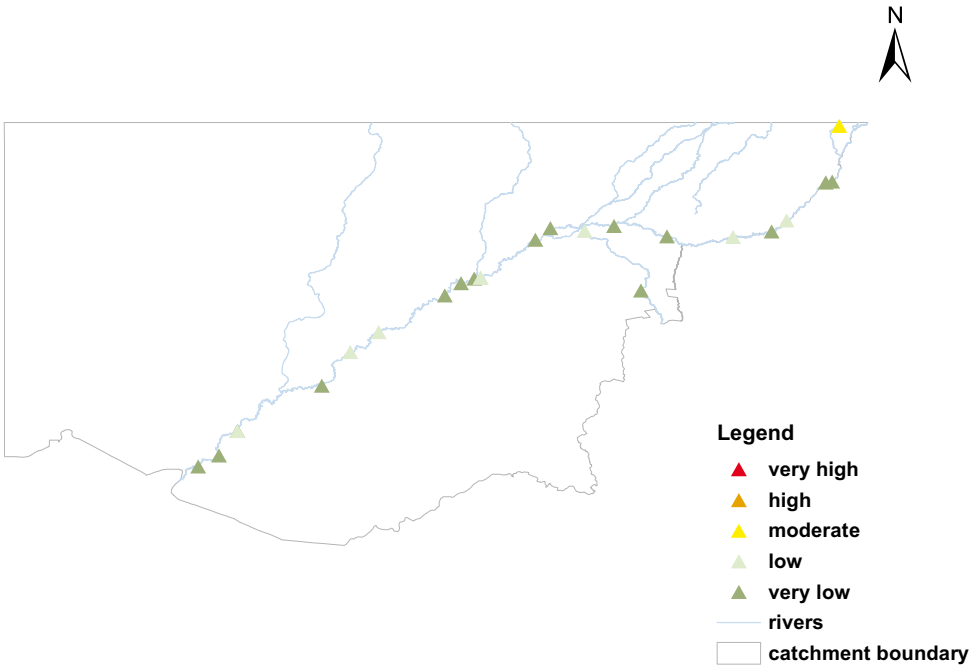


Figure 3 Alien fish percentage in the Western region

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%

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 Western region. A draft plan for the Western region is being developed to guide investment until 2015
  - protecting conservation reserves from the impacts of feral goats; strategic management of artificial watering points to reduce feral goat impacts in national parks and nature reserves in the Western region. Priority sites include Culgoa, Gundabooka and Paroo–Darling National Parks and Nocoleche Nature Reserve. Pre-control monitoring of biodiversity and feral goats has been completed
  - 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
- research, including:
  - an early detection program for aquatic weeds
  - the resistance of herbicides in the northern grain cropping belt

  - vine weed research project (cats claw creeper and madeira vine)
  - South East NSW and Australian Capital Territory (ACT) 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 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 Western region include conservation reserves and private lands in the following areas: Mutawintji and Coturaundee. 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 Western Catchment Management Authority (CMA) is undertaking the following activities in relation to the invasive species target:

- community workshops to identify priority pest animals
- an incentive program to provide landholders with funding to install total grazing pressure fencing and trap yards to assist with the removal of feral goats
- several joint projects with the Livestock Health and Pest Authorities (LHPAs) to manage fox numbers through baiting on private property
- a collaborative project with the National Parks and Wildlife Service, I&I and several LHPAs to undertake a feral pig control program involving baiting, trapping and aerial shooting
- a new program to manage wild dog populations in the Western catchment
- funding landholders to undertake rabbit ripping on private property
- several large-scale projects to contain and treat infestations of priority pest plants such as Hudson pear and mesquite. As of this reporting date, an area of 457,635 ha has been subjected to treatment. In addition, smaller scale projects have been undertaken to manage less prevalent species such as athel pine, boxing glove cactus and devils rope. Negotiations were also undertaken with South Australia regarding joint athel pine control projects
- partnerships with local government to manage boxthorn on council-managed land
- joint projects with LHPAs, agencies and local government to manage invasive species (eg pigs, foxes, wild dogs, mesquite, African boxthorn)

- mapping the extent of the devils rope and several other cacti in the Broken Hill area of the Western region
- receiving early warning advice from local councils regarding new infestations along rivers and roads
- developing guidelines on how to manage lippia
- holding workshops to identify pest plants that may impact on biodiversity in the Western region.

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 Landcare program, which implements an incentive program to provide funding to groups of landholders to manage pest plants and animals
- the Bourke Shire Council and Castlereagh Macquarie County Council, which are working on Hudson pear control programs
- the Bourke Shire Council, which undertakes aerial surveys over the waterways in the Western catchment to detect the presence of aquatic weeds such as water lettuce
- partnerships between landholders and government agency representatives to manage mesquite (eg the Prickle Bush Working Party)
- bio-control methods for Hudson pear are being undertaken by I&I in the Lightning Ridge area.

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].

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