

State of the catchments 2010

Invasive species

Murray region

State Plan target

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

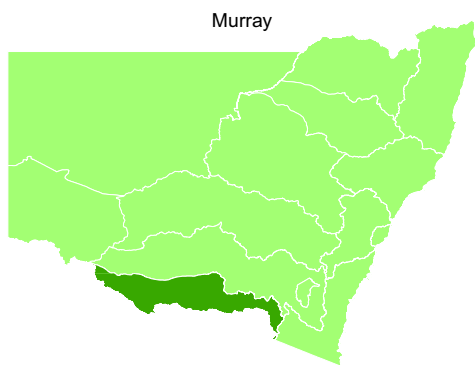
Background

'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
<div><div></div>Moderate</div>	?	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		3		?	M
Emerging invasive species				?	M
Freshwater pests		6		?	H
Pest animals		2		?	M
Weeds		25		?	M
Widespread invasive species				?	M
Foxes			inconclusive	?	M
Freshwater pests		47.16%		?	H
Wild dog losses		1107		?	L

***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 Murray region.

Pest animals

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

Weeds

There are three new weed species reported in the Murray region.

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

Scientific Name	Common Name
<i>Arundo donax</i>	giant reed/elephant grass
<i>Parthenium hysterophorus</i>	parthenium weed
<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 Murray region.

Table 3 Emerging freshwater pest species reported in the Murray 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 are two emerging pest animal species reported in the Murray region.

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

Scientific Name	Common Name
<i>Equus caballus</i>	feral horses
<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 22 emerging weeds reported in the Murray region.

Table 6 Emerging weeds reported in the Murray region

Scientific Name	Common Name
<i>Alhagi maurorum</i>	camel thorn
<i>Alternanthera philoxeroides</i>	alligator weed
<i>Bryophyllum</i> spp. and hybrids	mother-of-millions
<i>Celtis sinensis</i>	Chinese celtis
<i>Cestrum parqui</i>	green poisonberry/green cestrum
<i>Chrysanthemoides monilifera</i>	bitou bush (1)/boneseed (2)
<i>Cytisus scoparius</i>	Scotch, English and Spanish broom
<i>Genista monspessulana</i>	montpellier broom/cape broom
<i>Hieracium</i> spp.	hawkweed/orange hawkweed
<i>Hyparrhenia hirta</i>	coolatai grass
<i>Ipomea indica</i>	morning glory (purple)
<i>Moraea</i> spp.	cape tulips
<i>Nassella hyalina</i>	cane needle grass



Scientific Name	Common Name
<i>Nassella neesiana</i>	Chilean needle grass
<i>Nassella trichotoma</i>	serrated tussock
<i>Pennisetum setaceum</i>	fountain grass
<i>Pennisetum villosum</i>	long-style feather grass
<i>Prosopis</i> spp.	mesquite
<i>Salpichroa organifolia</i>	pampas lily of the valley
<i>Sorghum</i> sp. hybrid cultivar	silk forage sorghum
<i>Ulex europaeus</i>	gorse
<i>Vachellia farnesiana</i>	mimosa bush

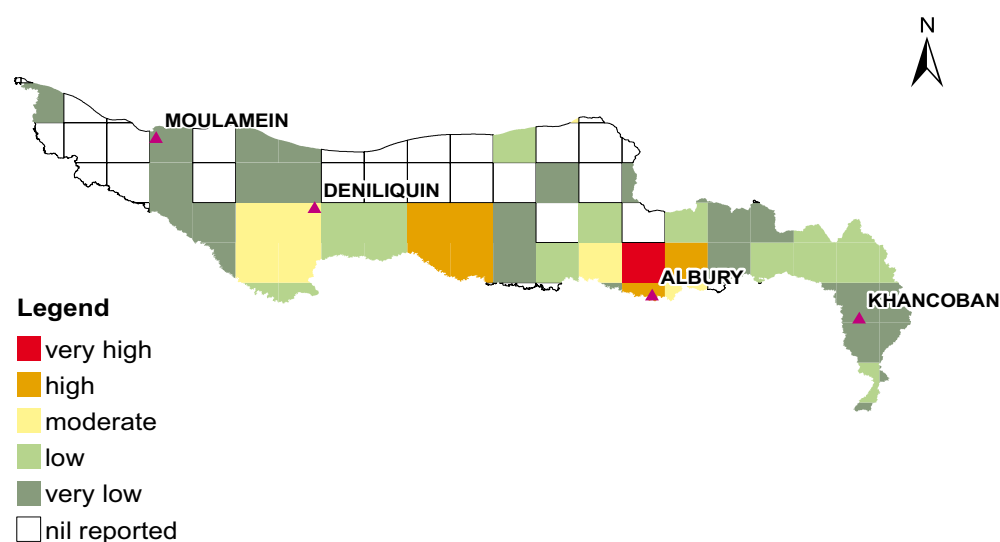


Figure 2 New and emerging weeds index (aggregation of weeds data for indicators 1 and 2)

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, the number of stock losses attributed to wild dogs, 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 7 Threatened species protected in the Murray region by fox control

Threatened species	Population numbers at fox control sites
plains-wanderer	inconclusive

Plains-wanderers were recorded across the area in very low numbers. Encounter rates were, on average, one bird every 27 kilometres. The abundance of plains-wanderers has decreased significantly since monitoring commenced in 2001, regardless of fox control. It is highly likely that drought has strongly influenced the abundance of plains-wanderers at all sites. The net result for the threatened species is inconclusive as to the impact of foxes at priority 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 Murray region is 47.16 per cent.

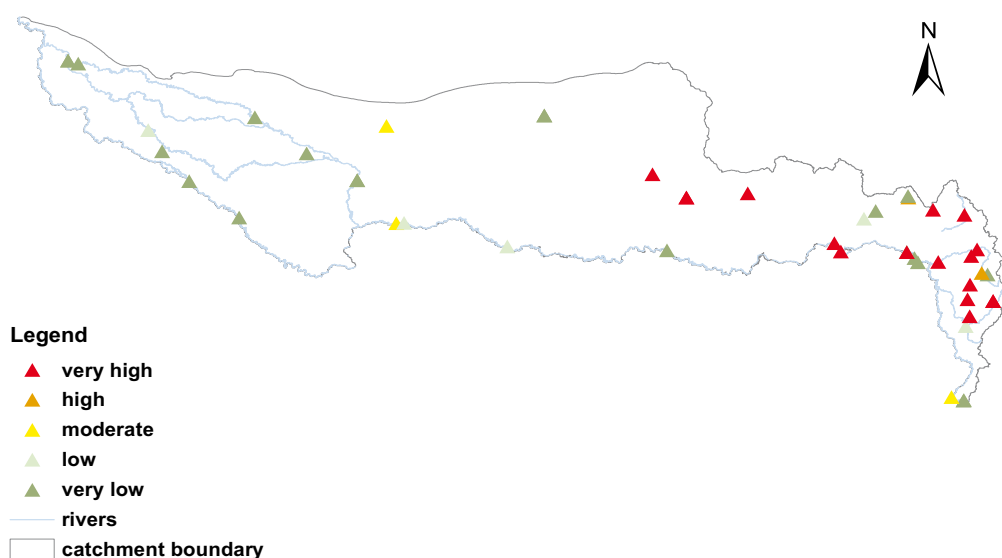


Figure 3 Alien fish percentage in the Murray region

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 Murray region, there were 1107 stock losses attributed to wild dogs reported to I&I during the period 2004–2007.

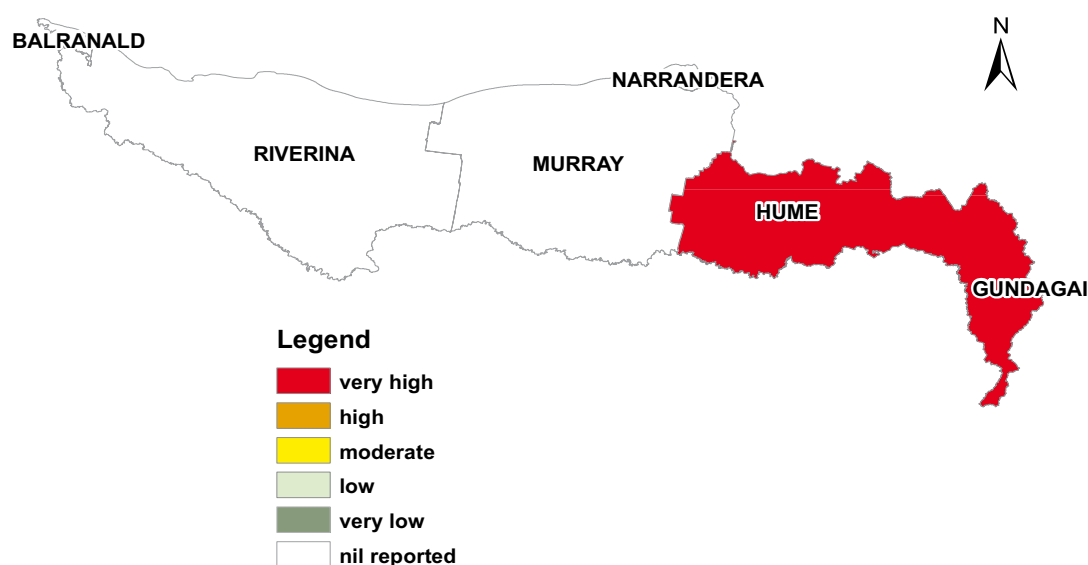


Figure 4 Wild dog stock losses in the Murray region

The indicator classes are:

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

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 Murray region. A draft plan for the Murray 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
- 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)
 - 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
 - estimating feral goat numbers.

Regional level

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



- completing a Murray catchment regional weed strategy
- boxthorn control in high conservation value native vegetation; to date* over 450 ha have been treated
- the Booroolong frog project; to date* 19 ha of Booroolong frog habitat has been protected and enhanced, including willow removal
- willow control along the Yanco Creek; to date* more than 15 km of priority creek areas have been controlled across more than 30 ha
- development of a pest animal species strategy.

* 'to date' refers to the period from July 2006 to June 2008

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:

- LHPAs and landholders undertaking pest animal control work
- landholders, local governments and weed councils undertaking weed control work
- Landcare groups including the Corowa and Splitters Creek groups, which coordinate fox control.

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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