

State of the catchments 2010

Invasive species

Namoi region

State Plan target

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

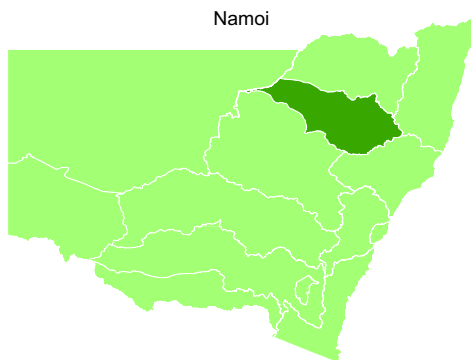
Background

'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

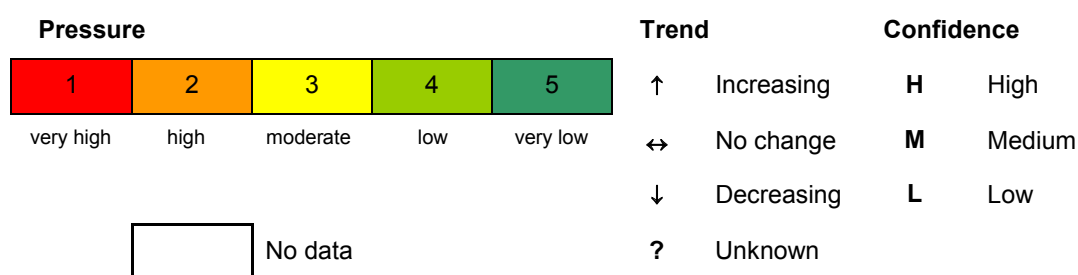
| Overall assessment across indicators | Trend | Confidence |
|--|-------|------------|
|  Moderate | ? | Medium |

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 | | 4 | | ? | M |
| | | | | | |
| Emerging invasive species | | | | ? | M |
| Freshwater pests | | 3 | | ? | H |
| Pest animals | | 2 | | ? | M |
| Weeds | | 16 | | ? | M |
| | | | | | |
| Widespread invasive species | | | | ? | M |
| Foxes | | | inconclusive | ? | M |
| Freshwater pests | | 39.83% | | ? | H |
| Wild dog losses | | 3548 | | ? | 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 Namoi region.

Pest animals

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

Weeds

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

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

| Scientific Name | Common Name |
|---------------------------------|--------------------|
| <i>Equisetum</i> spp. | horsetail |
| <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 three emerging freshwater pest species reported in the Namoi region.

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

| Scientific Name | Common Name |
|----------------------------|---------------|
| <i>Carassius auratus</i> | goldfish |
| <i>Oncorhynchus mykiss</i> | rainbow trout |
| <i>Salmo trutta</i> | brown trout |

Pest animals

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



Table 4 Emerging pest animal species reported in the Namoi 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 |

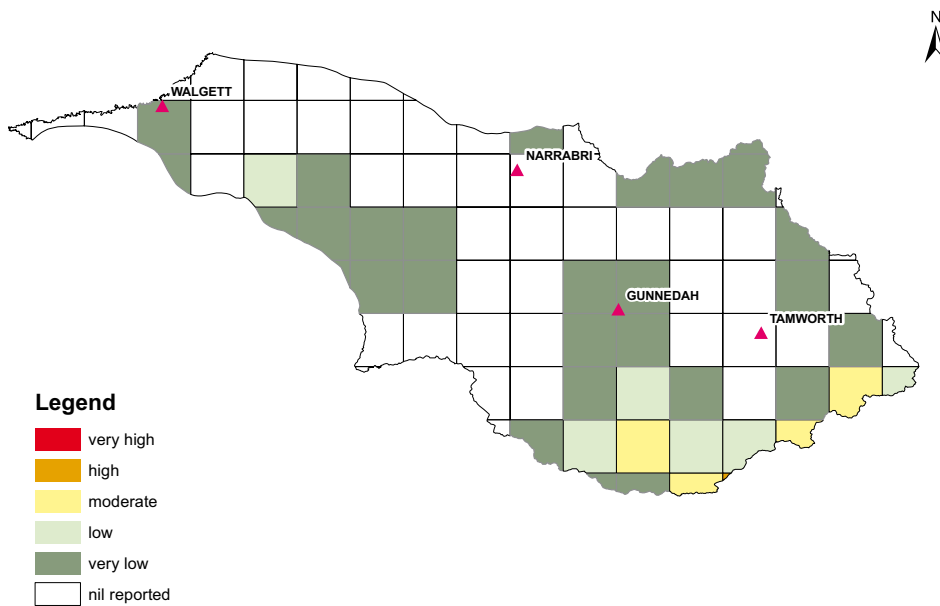


Figure 1 New and emerging pest animal index (aggregation of pest animal data for indicators 1 and 2)

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 16 emerging weeds reported in the Namoi region.

Table 6 Emerging weeds reported in the Namoi region

| Scientific Name | Common Name |
|-----------------------------------|-----------------------------------|
| <i>Asparagus asparagoides</i> | bridal creeper |
| <i>Cardiospermum grandiflorum</i> | balloon vine |
| <i>Cytisus scoparius</i> | Scotch, English and Spanish broom |
| <i>Genista monspessulana</i> | montpellier broom/cape broom |
| <i>Ipomea indica</i> | morning glory (purple) |
| <i>Lantana montevidensis</i> | lantana (creeping) |
| <i>Lonicera japonica</i> | Japanese honeysuckle |
| <i>Nassella hyalina</i> | cane needle grass |
| <i>Nassella neesiana</i> | Chilean needle grass |
| <i>Nassella tenuissima</i> | Mexican feather grass |
| <i>Nassella trichotoma</i> | serrated tussock |
| <i>Pennisetum setaceum</i> | fountain grass |
| <i>Physalis virginiana</i> | perennial ground cherry |



| Scientific Name | Common Name |
|---------------------------|------------------------|
| <i>Pyracantha</i> sp. | firethorn |
| <i>Scolymus maculatus</i> | spotted golden thistle |
| <i>Ulex europaeus</i> | gorse |

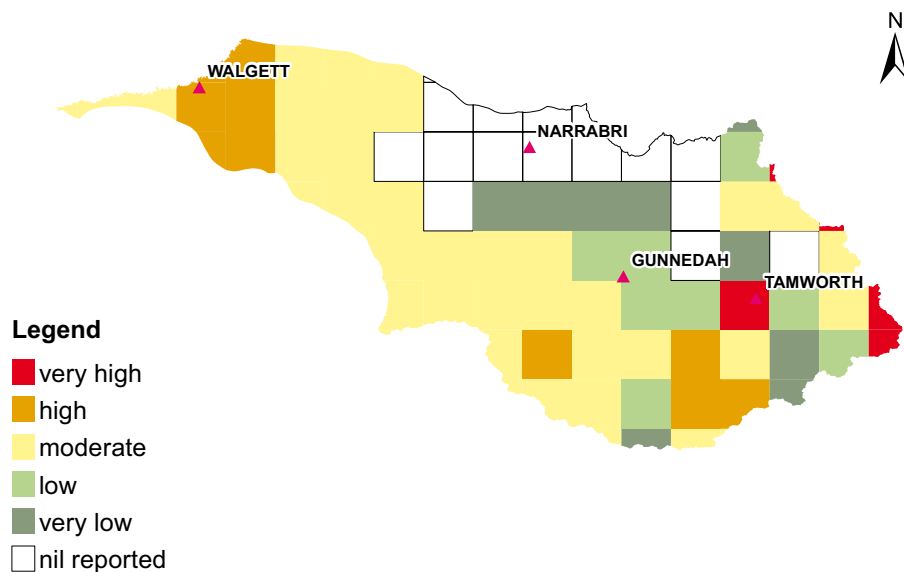


Figure 2 New and emerging weeds index (aggregation of weeds data for indicators 1 and 2)

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 Namoi region by fox control

| Threatened species | Population numbers at fox control sites |
|-----------------------|---|
| black-striped wallaby | inconclusive |

The number of wallabies continued to show an overall increase in the 12 months following the introduction of standardised autumn and spring surveys in 2003, in spite of a sharp drop in numbers in the autumn 2004 survey. Although wallaby numbers have fallen since spring 2004, there is some indication – as shown in Figure 3 – that the numbers may have begun to stabilise, at approximately 25 animals in each population. The influence of rainfall on the wallaby populations was also examined, and the mean rainfall for each six month-period in Narrabri follows a similar pattern as the mean number of black-striped wallabies observed in spotlight surveys during the same period. The net result for the threatened species is inconclusive as to the impact of foxes at priority sites.

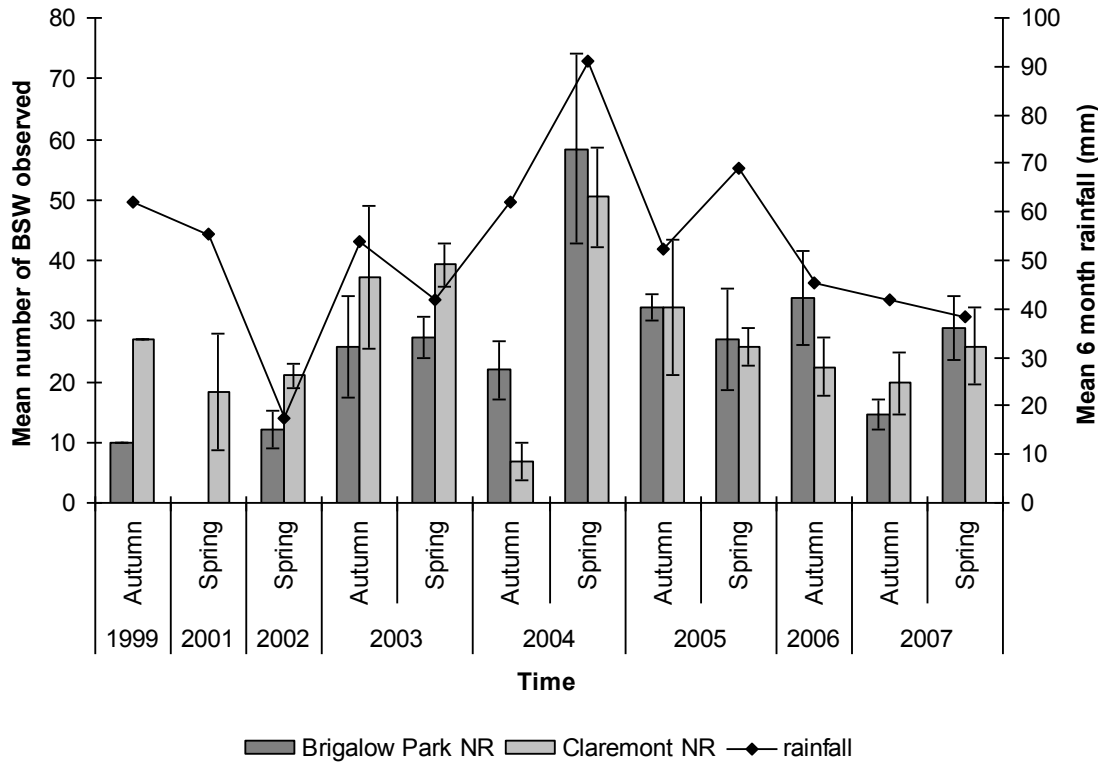


Figure 3 The relationship between rainfall and the mean number of black-striped wallabies observed during spotlight surveys. Rainfall data is the mean rainfall recorded for Narrabri during the first six months of each year (corresponding with the autumn surveys) and the final six months of the year (corresponding with the spring surveys).

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 Namoi region is 39.83 per cent.

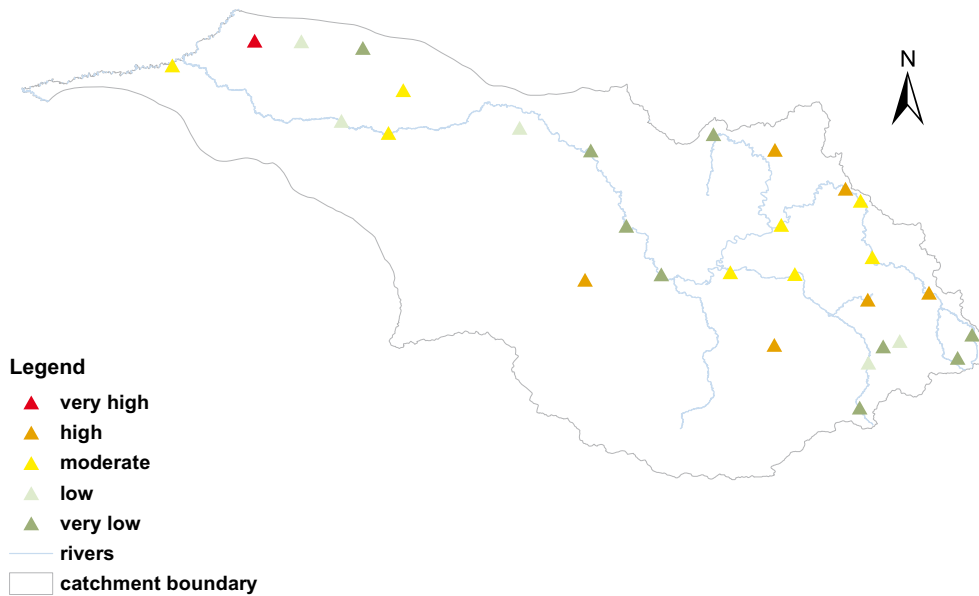


Figure 4 Alien fish percentage in the Namoi region

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 Namoi region, 3548 stock losses attributed to wild dogs were reported to I&I during the period 2004–2007.

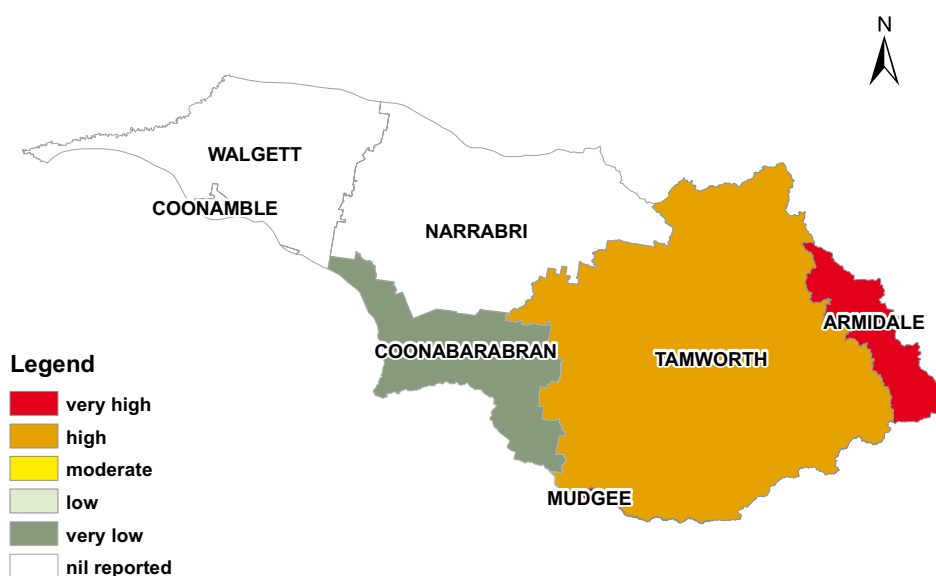


Figure 5 Wild dog stock losses in the Namoi region

The indicator classes are:

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

Additional information provided by Namoi Catchment Management Authority

Indicators 1 and 2

Namoi Catchment Management Authority understands the difficulties in measuring long-term changes in the distribution and abundance of invasive species. As such, it has no information at this stage to add to the indicators of numbers of new invasive species or the distribution/abundance of emerging invasive species. In future years, however, it will have spatial data on current weed infestations (emerging and widespread) across the Namoi catchment as its coordinated database 'WeedTracer' becomes populated with data. The state of the catchments (SOC) reports for invasive species give no clear pressure indicators and the assessment of impact was based on management response, which is unlikely to change. It will be very unlikely that resource condition will therefore change over time at this scale or with this methodology, making this a poor tool for ensuring resource condition changes. In terms of other invasive species, Namoi CMA would rather rely on actual numbers and population spread of invasive species than their impact. This is due to the inherent difficulties in proving the lines of impact (eg that black-striped wallaby population numbers are directly proportional to the impact of foxes). Data collected on the change includes the 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. Unknowns in the usual method of reporting stock losses make it difficult to attribute losses to invasive wild dogs or dingoes. This data is also difficult to correlate with potential native animal losses; if the number

of stock losses is at an all-time low, this does not mean that native animals are likewise surviving well.

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 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 Namoi region. A draft plan for the Namoi 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 co-ordination 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)
 - 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 DECCW's state of the environment report
 - Fox TAP; the monitoring of biodiversity and foxes in response to fox control at priority sites. Priority sites in the Namoi region include conservation reserves and private lands in Mt Kaputar, Brigalow Park and the Warrumbungles. The biodiversity response is being analysed as part of the review of the Fox TAP
 - 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
 - estimating feral goat numbers.

Regional level

At the regional level, the Namoi CMA is undertaking the following activities in relation to the invasive species target:

- control of new and emerging weeds (22 on ground targeted weed projects) within the catchment. Namoi CMA's '20 targeted weeds' brochure can be found at www.namoi.cma.nsw.gov.au/attachments/weeds_fact_sheet.pdf
- targeted widespread weed control in regionally significant vegetation, where control is achievable. This was developed with the DECCW and I&I
- development of regional pest plan priority sites
- two current and two potential on-ground pest animal control projects (for the protection of the rock wallaby)
- an education program aimed at all residents within the Namoi catchment. Six television (TV) advertisements rolled out over an 18-month period, along with educational material, print media and external organisation funding to further develop weed resources.

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 Northern Inland Weeds Advisory Committee (NIWAC), which is undertaking an integrated, targeted approach to weed management in the eastern half of the Namoi catchment, using elements such as TV campaigns and the development of educational material
- Liverpool Plains Shire Council, which is partnering with Namoi CMA and the Roads and Traffic Authority to highlight 'sleeper weeds' within the region (control and education)

- Tamworth Regional Council, Gunnedah Shire Council, Narrabri Shire Council and the New England Weeds Authority, which are partnering with Namoi CMA for the WeedTracer mapping program (funded by Namoi CMA). The mapping program is being introduced across the entire catchment. This will allow a uniform approach to weed data collection and the ability to develop a catchment-wide map layer of weeds
- Klori Landcare group, which is conducting control of coolatai grass in Grassy Box Woodlands near Manilla
- Quirindi Creek Catchment Committee, which is conducting (and educating on) riparian weeds removal in Quirindi and Jacob and Joseph creeks
- The National Parks and Wildlife Service, which is conducting coordinated control of invasive animals in and around Warrumbungle National Park and Mount Kaputar National Park
- DECCW, which is conducting coolatai grass control and research on travelling stock routes (TSRs)
- I&I and the University of Canberra, which are undertaking regional pest management development with Namoi CMA
- Central North LHPA, which conducts weed control on TSRs (funded by Namoi CMA)
- North West LHPA, which undertakes invasive animal control on properties adjoining Mount Kaputar National Park
- the National Lippia Working Group, which develops educational material (lippia manual)
- the University of New England, which has several masters students studying the effects of lippia in the Murray–Darling Basin.

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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DECCW 2010/363 ISBN 978 1 74232 676 4 November 2010

Cover photo: R Nicolai/DECCW – 'morning glory'