Native vegetation

Southern Rivers region

State Plan target

By 2015, there is an increase in native vegetation extent and an improvement in native vegetation condition.
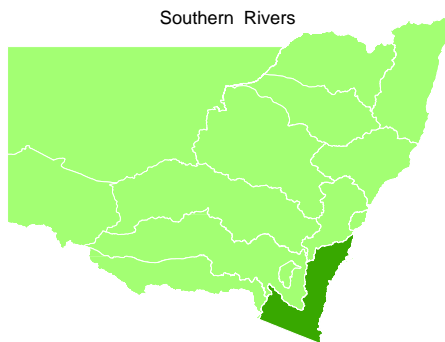
Background

Native vegetation is fundamental to most natural ecosystems. It contributes to biodiversity and provides habitat and resources for native animals. This report makes significant advances in reporting the spatial extent and condition of native vegetation within the region, as well as providing information on current pressures affecting native vegetation extent and condition. This report has used additional state-wide data layers that have improved on current state-wide reporting products.

Map of the catchment

Southern Rivers

Assessment

The overall status of vegetation within the catchment combines assessments of vegetation extent and vegetation condition. Each assessment is summarised on a five-colour scale representing (from green to red) 'very good', 'good', 'fair', 'poor' to 'very poor'. As is commonly done in these kinds of assessments the reference condition to which these measures are compared is 'pre-European'. Given the fact that there is a history of 200 years of intervention in all NSW catchments, it cannot be expected that either vegetation extent or condition would correspond to the pre-European state. Nonetheless, it is useful to assess how far removed from that state the current situation is. Pressures on vegetation extent and condition are provided on a five-colour scale representing (from green to red) 'very low', 'low', 'moderate', 'high' to 'very high'.

Where available data allows for an assessment of a trend from 2006 to 2009, this trend is represented by arrows representing an increase in extent or condition (⇧), or a decrease in extent or condition (⇩), or no change (–). Where available data does not allow for an assessment of trend, the question mark symbol (?) is shown.

Confidence in the data used for assessments is shown as H (high), M (medium) and L (low).

Vegetation extent

The status of vegetation extent is presented on a map of the catchment (Figure 1), where each of the four vegetation extent states is represented by a different colour. These states conform to the NSW Government definitions of native vegetation extent.

- native – intact: native vegetation in which the structure has not been substantially altered by human activities, or has been altered and has since recovered

- native – derived: vegetation that is predominantly native but has been substantially altered by human activities and is no longer structurally intact

- native/non-native mosaic: vegetation that cannot readily be classified as either native or non-native using current remote sensing methods

- non-native or other: non-native vegetation including crops, non-native plantations and non-native pastures, or other non-vegetation land cover types, including urban, industrial and infrastructure.

The map legend (Figure 1) indicates which areas of the catchment are represented by each of these four extent states. Also shown is a bar chart (Figure 2) that provides a visual summary of the percentage of the total catchment area represented by each of these four extent states. A separate bar chart (Figure 3) shows the percentage of the total catchment represented by native woody and native non-woody vegetation. For each of these bars, upper and lower limits (shown by cross-hatching) are determined by the extent of native/non-native mosaic vegetation unable to be accurately classified within each of the two categories.

Table 1   Vegetation extent

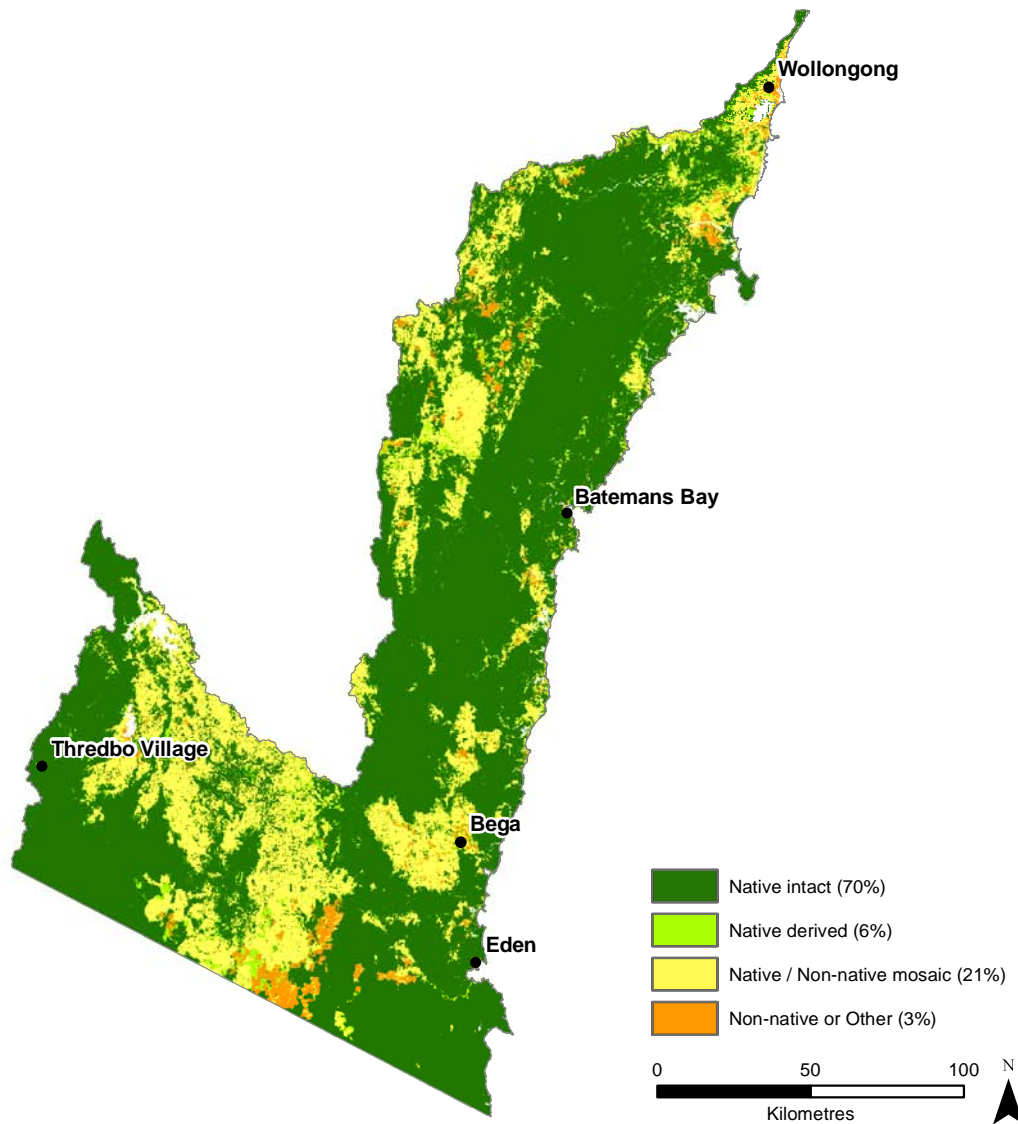|	Rating	Index	Trend	Confidence
State of NSW	Good	70/100	?	H
Southern Rivers	Good	78/100	?	H

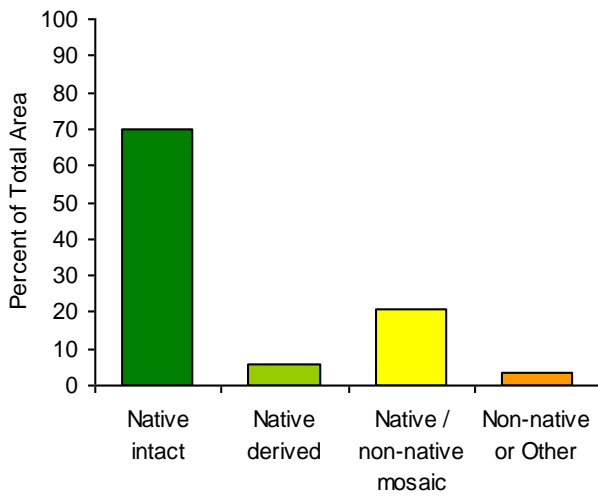**Figure 1   Coverage of extent states**

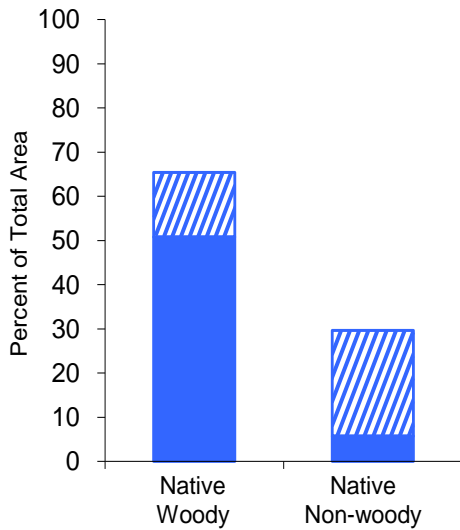**Figure 2   Extent states as percentage of total catchment area**

Figure 3   Native woody and native non-woody vegetation as percentage of total catchment area

Condition

The status of vegetation condition is presented on a map of the catchment (Figure 4), where each of the six vegetation condition states is represented by a colour. The six states conform to the modification states of the draft National Vegetation Condition Classification (VAST – Vegetation Assets, States and Transitions). Modification states are based on the impacts of human land-use and land management practices on vegetation relative to a vegetation condition benchmark. Assessments in future State of the catchments reports will use more direct measures of condition. There are current projects that are developing appropriate methodologies.

The vegetation condition states (from highest to lowest) are:

- residual: native vegetation community structure, composition and regenerative capacity is intact – no significant perturbation from land-use or land management practices
- modified: native vegetation community structure, composition and regenerative capacity is intact – perturbed by land-use or land management practices

- transformed: native vegetation community structure, composition and regenerative capacity is significantly altered by land-use or land management practices
- transformed/replaced-adventive mosaic: vegetation that cannot readily be classified as either transformed (native) or replaced-adventive* (non-native) on the basis of available state-wide datasets
- replaced-managed: native vegetation is replaced with cultivated vegetation
- removed: vegetation removed to leave non-vegetated land cover.

The map legend (Figure 4) shows which areas of the catchment are represented by each of these six condition states. Also shown is a bar chart (Figure 5) that provides a visual summary of the percentage of the total catchment area represented by each of these six condition states.

* The replaced-adventive modification class represents vegetation that has had the dominant structuring species of the native vegetation community removed, predominantly cleared or extremely degraded. The combined transformed/replaced-adventive mosaic condition state represents the expression within the National Vegetation Condition Classification of the native/non-native mosaic (see 'vegetation extent'), which results from our incomplete state of knowledge.

Table 2   Vegetation condition

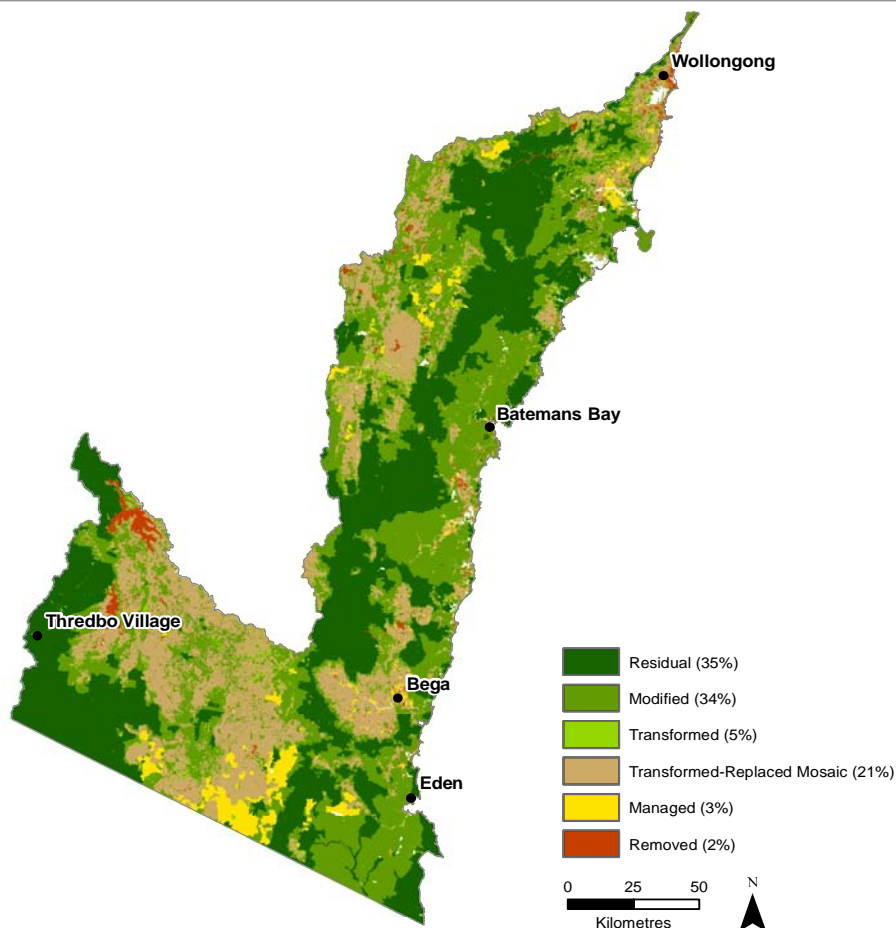|	Rating	Index	Trend	Confidence
State of NSW	Fair	51/100	?	M
Southern Rivers	Good	61/100	?	M

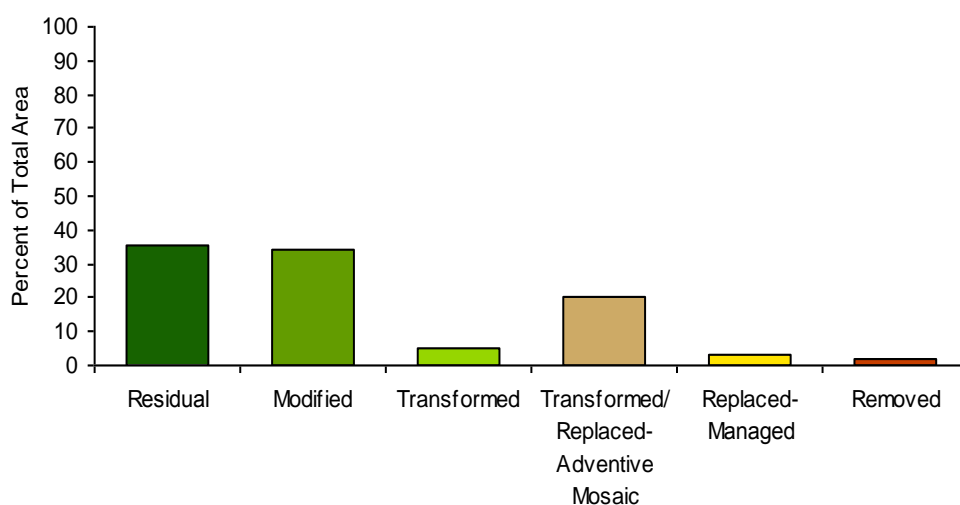**Figure 4   Vegetation condition across the catchment area**

Figure 5 Condition categories as percentage of total catchment area

Pressures

The pressures on vegetation extent and condition are presented on a map of the catchment (Figure 6), where each of the five pressure classes is represented by a colour. The five pressure classes conform to the primary classes of the Australian Land Use and Management Classification. Primary pressure classes relate to the prime use of the land and are distinguished in order of generally increasing levels of intervention or potential impact on the natural landscape.

The five pressure classes are:

- conservation and natural environments: land used primarily for conservation purposes, based on the maintenance of the essentially natural ecosystems present
- relatively natural environments: land used primarily for primary production, with limited change to the native vegetation
- dryland agriculture and plantations: land used mainly for primary production, based on dryland farming systems
- irrigated agriculture and plantations: land used mostly for primary production, based on irrigated farming
- intensive uses: land subject to extensive modification, generally in association with closer residential settlement, or commercial or industrial uses.

The map legend (Figure 6) shows which areas of the catchment are represented by each of these five pressure classes. Also shown is a bar chart (Figure 7) that provides a visual summary of the percentage of the total catchment area represented by each of these five pressure classes.

Table 3 Vegetation pressures

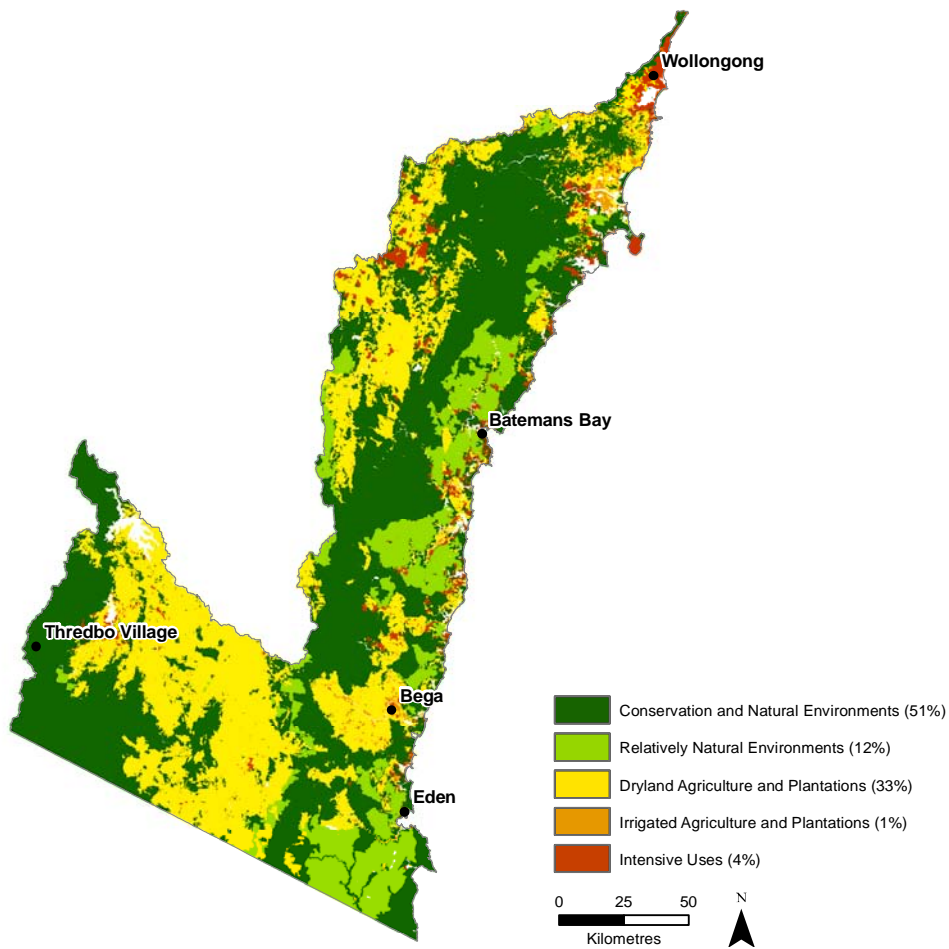|	Rating	Index	Trend	Confidence
State of NSW	Low	39/100	?	H
Southern Rivers	Low	30/100	?	H

Figure 6   Pressure classes across the catchment area

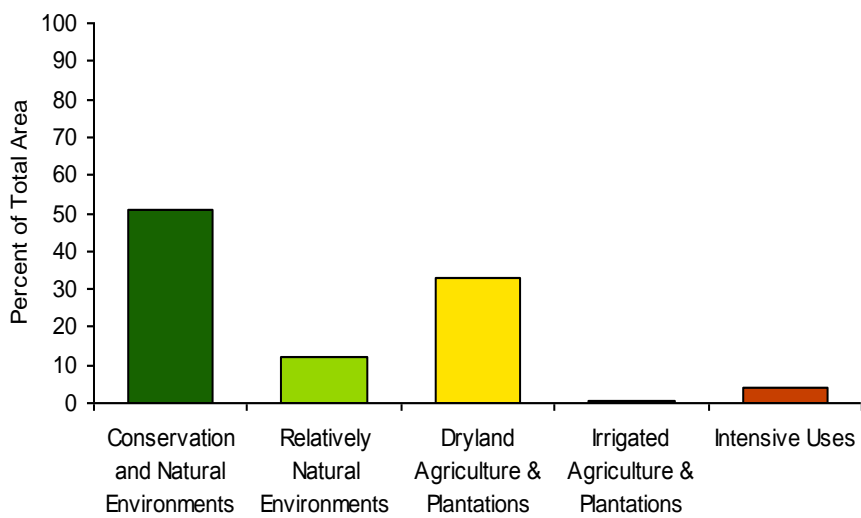**Figure 7   Pressure classes as percentage of total catchment area**

Status

Table 4   Overall status

	Rating	Index	Trend	Confidence
State of NSW	Good	61/100	?	M
Southern Rivers	Good	69/100	?	M

The overall status of native vegetation within the state and the region was calculated as the average of the index scores for vegetation extent and vegetation condition.

Index calculations

Vegetation extent

This index was calculated as the sum of the following products:

- percentage of the total area of:
    - native – intact vegetation   x 1.00
    - native – derived vegetation   x 0.50
    - native/non-native mosaic vegetation   x 0.25
    - non-native or other   x 0.00

This index recognises that the first three vegetation extent states contribute to an overall assessment of native vegetation extent. However, it does weight each extent state relative to a benchmark of original or 'pre-1750' native vegetation extent. This is outlined below:

- Native – intact vegetation contributes to an assessment of the extent of original or 'pre-1750' vegetation types. Its extent contributes completely to the index.

- Native – derived vegetation contributes to an assessment of the extent of native vegetation as defined under the *Native Vegetation Act 2003*. Its extent contributes half as much to the index as native – intact.

- Native/non-native mosaic contributes to an assessment of the potential extent of native vegetation as defined under the *Native Vegetation Act 2003*. As current vegetation extent mapping and monitoring programs deliver greater certainty about native vegetation extent, the amount of mapped native/non-native mosaic will lessen. Greater knowledge gained from new vegetation mapping and improved remote sensing capabilities will see a significant proportion of this mapped area allocated to one of the other three categories. It is likely, however, that many areas will still remain in this category because of the native/non-native vegetation cycles common in some landscapes. Given this uncertainty, the extent of native/non-native mosaic contributes half as much to the index as native – derived.

Vegetation condition

This index was calculated as the sum of the following products:

percentage of the total area of:

- residual   x 0.80
- modified   x 0.60
- transformed   x 0.50
- transformed/replaced-adventive mosaic   x 0.40

– replaced-managed	x 0.20
– removed	x 0.05

The index recognises that the six different modification states of the draft National Vegetation Condition Classification (VAST) broadly represent degrees of impact on vegetation (relative to a vegetation condition benchmark) of human land-use and land management practices.

Areas were mapped to one of the six states based on decision rules applied to a range of state-wide datasets (see supporting technical report). Average condition values assigned to each state (six product terms above) in determining the index were based on expert opinion.

Vegetation pressures

This index was calculated as the sum of the following products:

- percentage of the total area of:

– conservation and natural environments	x 0.0
– production from relatively natural environments	x 0.3
– production from dryland agriculture and plantations	x 0.6
– production from irrigated agriculture and plantations	x 0.9
– intensive uses	x 1.5

Areas were mapped to one of the above five primary land-use classes based on decision rules within the NSW Land-Use Mapping data (see supporting technical report). Average pressure values given above for each of the five primary land-use classes were chosen using expert opinion to show relative pressure indices state-wide. Land-uses that exhibited a greater pressure on vegetation received a higher average pressure value.

Indices were mapped to extent and condition states and pressure classes according to the following index ranges:

Extent and condition		Pressure	
0.0 – 0.2	very poor	0.0 – 0.2	very low
> 0.2 – 0.4	poor	> 0.2 – 0.4	low
> 0.4 – 0.6	fair	> 0.4 – 0.6	moderate
> 0.6 – 0.8	good	> 0.6 – 0.8	high
> 0.8 – 1.0	very good	> 0.8 – 1.0	very high

Management activity

State level

At the state level, the native vegetation target is being addressed via the 2003 NSW native vegetation reforms and the *Native Vegetation Act 2003*. Actions include:

- regulatory actions such as:

  - ending broad scale clearing unless it improves or maintains environmental outcomes

  - using a risk-based enforcement strategy to deter and act against illegal clearing

  - upgrading enforcement and monitoring, including annual inspections using high resolution satellite imagery

- developing a native vegetation compliance and enforcement strategy to provide strategic direction for compliance and enforcement decisions and activities to be carried out transparently and clearly

- conservation covenants imposed by the Land and Property Management Authority on the conversion of Perpetual Leases to freehold title, to complement controls under the *Native Vegetation Act 2003*. Where possible, additional covenants to enhance the conservation value of existing vegetation are negotiated with landholders, sometimes with the assistance of catchment management authority (CMA) incentive funding

- protection and rehabilitation, through:

  - offering land managers and businesses opportunities such as property vegetation plans

  - BioBanking (a scheme involving certification and incentives, which was set up to offset the adverse impacts of development on biodiversity)

  - agency support for landholders in restoring and conserving native vegetation on private land

  - protecting and conserving natural and associated cultural heritage on public and private land in priority bioregions across the state

  - tackling major threats to native vegetation such as invasive plants and pest animals through programs to prevent, contain and manage their introduction and spread

- education, including:

  - education campaigns aimed at improving awareness of legislative obligations, targeted at land clearing contractors, property developers and stock and station agents

  - providing information, training and decision support tools to landholders and land managers, including a tool kit incorporating benchmarks for assessing biodiversity benefits from vegetation managed or planted for salinity mitigation

  - a range of courses run by Industry & Investment NSW in relation to native vegetation, with topics including the identification and management of native grass, private native forestry training course (pilot), paddock plants, and 'Prograze' (for more information see www.dpi. nsw.gov.au/agriculture/profarm/courses)

- monitoring, evaluation and reporting, including:

  - standardising NSW native vegetation data

  - informing the public on the rate of clearing in NSW.

Regional level

At the regional level, the Southern Rivers CMA is undertaking the following activities in conjunction with landholders, community groups and local councils in relation to the native vegetation target:

- the protection and improvement of over 8000 ha of native vegetation

- the completion of works on priority vegetation communities. In Southern Rivers CMA, there are 59 priority vegetation communities. These vegetation communities have been over-cleared and are not protected in national or state parks. Works have been completed on 28 of these communities, such as weed control, reducing grazing pressure and retaining dead timber

- commencing restoration works in almost all types of endangered ecological communities occurring in Southern Rivers CMA

- the assessment of vegetation clearing applications under the *Native Vegetation Act 2003* by a team of Southern Rivers CMA staff members. This involves assessing the vegetation and, if clearing is allowed, protecting other vegetation to offset the losses. Although 107 ha was given approval for clearing in 2009, 645 ha of vegetation was protected in perpetuity

- running a bush incentives program in the northern half of the CMA. This provides funding to landholders for the conservation management of native vegetation communities that have high conservation value.

Further reading

Bureau of Rural Sciences 2006, *Guidelines for land-use mapping in Australia: principles, procedures and definitions. A technical handbook supporting the Australian Collaborative Land-use Mapping Programme* Edition 3, Australian Government, Canberra.

Native Vegetation Technical Working Group 2008, Definition of native vegetation (combined definition) and operational terms for reporting its extent, Department of Environment and Climate Change NSW, Sydney.

Thackway R & Leslie R 2005, *Vegetation assets, states and transitions: accounting for vegetation condition in the Australian landscape,* BRS Technical Report, Bureau of Rural Sciences, Australian Government, Canberra.

Thackway R & Leslie R 2008, Describing and mapping human-induced vegetation change in the Australian Landscape, *Environmental Management*, Volume 42, Number 4/2008, www.springerlink.com/content/w318w7221202v2v8/.