

# Department for Environment and Heritage

## Native Vegetation Information for NRM Planning



## Fact Sheet



Government  
of South Australia

The implementation of the Natural Resources Management Act 2004 and the formation of eight Natural Resources Management (NRM) Regions in South Australia has altered the way natural resources are managed in South Australia. The Act provides the framework to coordinate and integrate the activities of the wide range of groups involved in natural resource management across the State. Regional NRM plans contain targets that aim to improve and preserve natural resources, however the ability to develop and implement these plans is dependent upon accurate and comprehensive spatial information.

This document describes the spatial native vegetation information available to NRM groups within South Australia. It discusses how vegetation information is collected and mapped, how it can be accessed and how it can assist with NRM planning.



*Xanthorrhoea australis*



*Solanum lancinatum*, Belt Hill Conservation Park

## What is native vegetation?

Native vegetation is defined as a plant or plants of a species indigenous to South Australia.

Vegetation mapping attempts to display vegetation types indigenous to South Australia, excluding vegetation grown for commercial forestry. Native vegetation includes relatively unmodified vegetation regrowth and scattered trees (high, medium and low density) with variability in the understorey condition. Individual plants are not mapped.

## How is vegetation described?

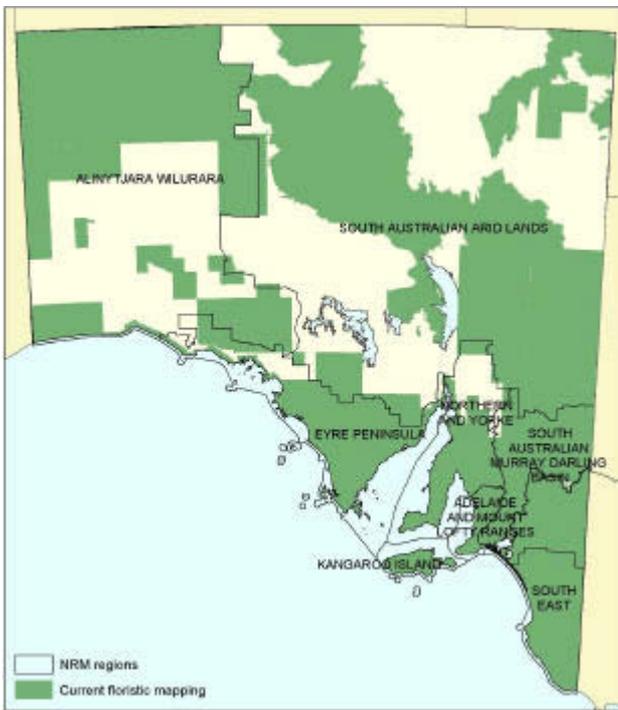
A national framework for describing vegetation has been developed. This framework, called NVIS (National Vegetation Information System), provides a nationally consistent standard for describing and compiling data for native vegetation types in Australia. The NVIS standard has been adopted by South Australia as the basis for recording SA vegetation information.

Individual regional vegetation mapping data sets collected over the past 25 years are currently in the process of being combined to align with the NVIS framework for recording native vegetation attributes.

## What native vegetation mapping is available?

### Remnant Vegetation

Floristic mapping of remnant native vegetation is available for approximately 50% of South Australia. In the agricultural regions, remnant vegetation data is available for the South East, Kangaroo Island, Southern Mount Lofty Ranges, Murray Mallee, Western Murray Flats, River Murray, Mid North and Eyre Peninsula (Figure 1). Data also exists for some of the northern areas of the State.



**Figure 1: Remnant floristic vegetation mapping within SA Natural Resources Management Regions**

### Pre-European Vegetation

Pre-European vegetation is also being mapped and is currently available for only a few areas of the State. This data is currently not aligned with the NVIS framework.

Regional pre-European vegetation mapping is available for the South East, Murray Mallee and Adelaide regions (Figure 2). Some mapping is available for the Mid North area between Crystal Brook, Port Pirie, Terowie and Hallett. Mapping of pre-European vegetation will continue for all agricultural districts over the next few years. The aim is to provide extensive information on South Australia's vegetation distribution at the time of settlement.

## How is native vegetation data collected?

Native vegetation surveys are conducted throughout the State on both public and private land<sup>1</sup>. Sites are selected to represent the range of vegetation groups within the region. Physical and vegetation data is then collected at each survey site. The physical data includes the landform, slope and aspect of the site, surface soil texture and the presence of any surface rock. The vegetation data includes lists of all species present and their cover abundance within the survey quadrat. Estimates of the overstorey species' height and canopy cover are recorded to determine the structure of the vegetation.

The Guide to a Native Vegetation Survey manual is available on the Department for Environment and Heritage website at the following link: <http://www.environment.sa.gov.au/biodiversity/bi-surveys.html>.

<sup>1</sup> Department of Housing and Urban Development, 1997, *Guide to a Native Vegetation Survey Using the Biological Survey of South Australia Methodology*, South Australian Government.



**Figure 2: Pre-European vegetation mapping within SA Natural Resources Management Regions**

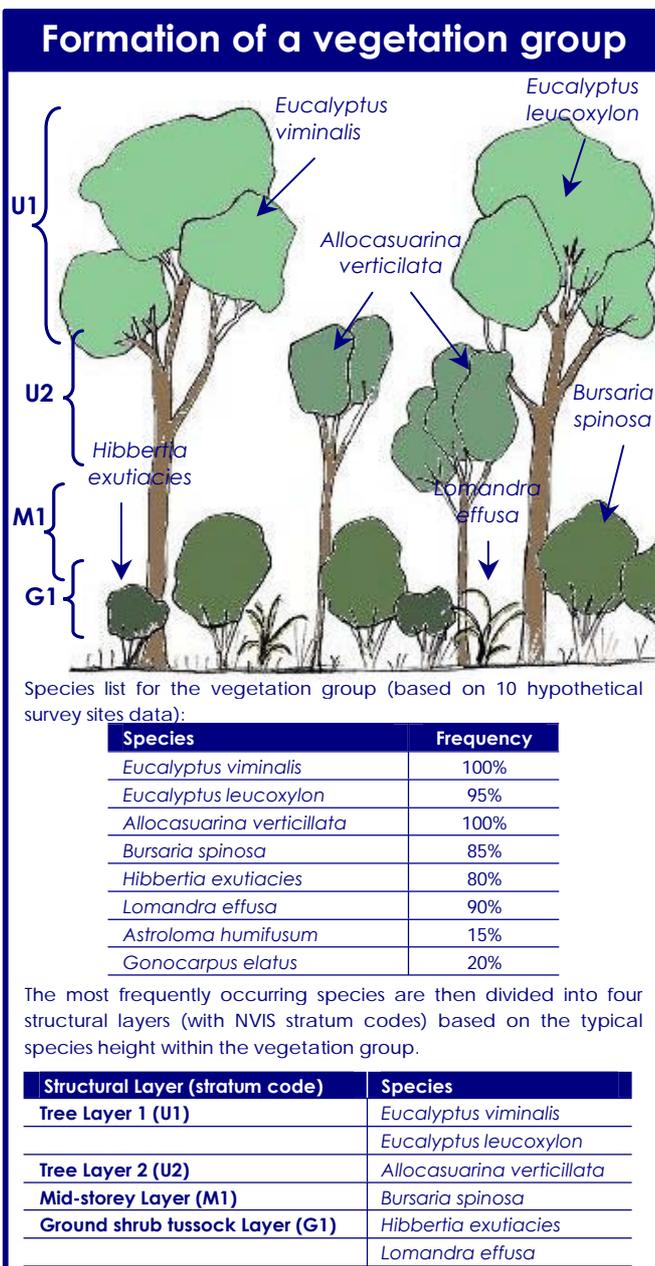
## How is native vegetation mapped?

### Mapping

#### Analysis

The vegetation survey site data is grouped into vegetation mapping units using an analytical computer tool and interpretation of patterns by vegetation experts. These groups represent units of plant species and overstorey structure that are considered appropriate at the scale of mapping.

An example of how the survey data is used to define the mapping groups is given below. This process involves assessing the species frequency within the survey sites to determine the typical dominant species and structural composition of the vegetation type.



Boundaries of each vegetation group are identified using aerial photographs or Landsat TM imagery at regional scales (Figure 3).

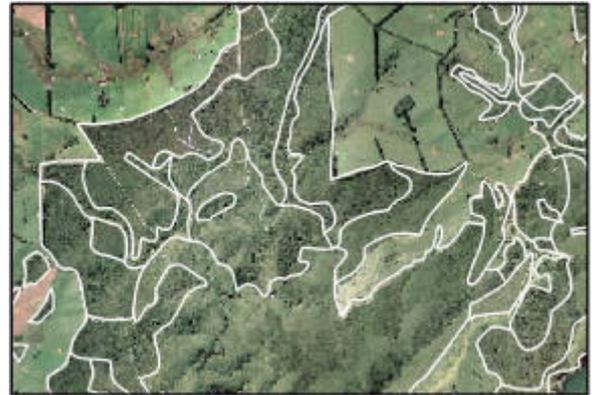


Figure 3: Vegetation mapping using an orthorectified photograph

For agricultural and arid regions, aerial photographs at scales of 1:10,000, 1:25,000, 1:40,000 and 1:80,000 are utilised while the Landsat TM imagery is used at scales of 1:100,000 and 1:250,000. The varying patterns, tones and textures visible in the imagery are combined with the survey data to map vegetation communities (Figure 4). Field checking concludes the process.



Figure 4: Vegetation types, defined in different colours, recorded within the mapped boundaries

Mapping of the pre-European vegetation combines historical and current records. Sources of information include the historical notes from early explorers, remnant paddock tree sites, roadside vegetation, land survey maps for Hundreds, biological survey records and aerial photographs. This information is combined with topographic and soils data to estimate the distribution of pre-European vegetation. The mapping boundaries are then transferred into a GIS and linked to the vegetation groups.

## What information do these data sets contain?

The remnant native vegetation mapping contains several attributes, including:

- o native vegetation extent,
- o vegetation type,
- o structure,
- o dominant species, and
- o stratum characteristics.

The vegetation-related attributes are stored under the NVIS hierarchical system. An example is given below to illustrate the hierarchical nature of the

vegetation descriptions. Species and growth forms are assigned to structural layers (upper, mid and ground) based on the typical height of the species recorded at the survey site.

Species cover abundance, frequency and dominance are recorded within these structural layers, as well as stratum cover, height and growth forms.

The pre-European vegetation attributes vary between the regions. The attributes may include the dominant overstorey species, indicator species, community structure, landform characteristics, soil types and native plant species lists.

## Hierarchical Vegetation Descriptions

This example uses data for Kangaroo Island (KI) to demonstrate the varying levels of detail available within the remnant native vegetation mapping. The sections entitled 'Vegetation type 1' and 'Vegetation type 2' illustrate the information stored for a vegetation type at each level of the NVIS hierarchy. Two vegetation types on KI are displayed at Level VI of the hierarchy in Figure 5. Two polygons with distinct vegetation types (1 and 2) are visible on this map. The same mapping types are displayed in Figure 6 at Level III. Vegetation types 1 and 2 represent 'Eucalyptus tree mallee' at Level III of the vegetation hierarchy. As a result, this map uses one colour to represent these vegetation types. These maps are derived from the same spatial layer, illustrating the hierarchical nature of the mapping.

### Vegetation type 1

Level I:	Tree mallee
Level II:	Mallee woodland
Level III:	Eucalyptus mallee woodland
Level IV:	Eucalyptus mallee woodland\Melaleuca shrubs\Correa shrubs
Level V:	<i>Eucalyptus rugosa</i> , +/- <i>Eucalyptus diversifolia</i> , +/- <i>Eucalyptus oleosa</i> mid mallee woodland over <i>Melaleuca lanceolata</i> shrubs over <i>Acacia retinodes</i> , <i>Leucopogon parviflorus</i> , <i>Acacia longifolia</i> shrubs over +/- <i>Correa reflexa</i> shrubs
Level VI:	<i>Eucalyptus rugosa</i> , +/- <i>Eucalyptus diversifolia</i> , +/- <i>Eucalyptus oleosa</i> mid mallee woodland over <i>Melaleuca lanceolata</i> shrubs over <i>Acacia retinodes</i> , <i>Leucopogon parviflorus</i> , <i>Acacia longifolia</i> , +/- <i>Melaleuca acuminata</i> , +/- <i>Myoporum insulare</i> shrubs over +/- <i>Correa reflexa</i> shrubs

### Vegetation type 2

Level I:	Tree mallee
Level II:	Mallee woodland
Level III:	Eucalyptus mallee woodland
Level IV:	Eucalyptus mallee woodland\Melaleuca (mixed) shrubs\Orthrosanthus (mixed) shrubs
Level V:	<i>Eucalyptus diversifolia</i> , +/- <i>Eucalyptus rugosa</i> , +/- <i>Eucalyptus oleosa</i> mid mallee woodland over <i>Melaleuca lanceolata</i> , <i>Acacia retinodes</i> , <i>Lasiopetalum schulzenii</i> shrubs over <i>Orthrosanthus multiflorus</i> , <i>Correa reflexa</i> , <i>Pomaderris paniculosa</i> shrubs
Level VI:	<i>Eucalyptus diversifolia</i> , +/- <i>Eucalyptus rugosa</i> , +/- <i>Eucalyptus oleosa</i> mid mallee woodland over <i>Melaleuca lanceolata</i> , <i>Acacia retinodes</i> , <i>Lasiopetalum schulzenii</i> shrubs over <i>Orthrosanthus multiflorus</i> , <i>Correa reflexa</i> , <i>Pomaderris paniculosa</i> , <i>Senecio odoratus</i> , <i>Myoporum insulare</i> shrubs

Figure 5: Vegetation types displayed at Level VI

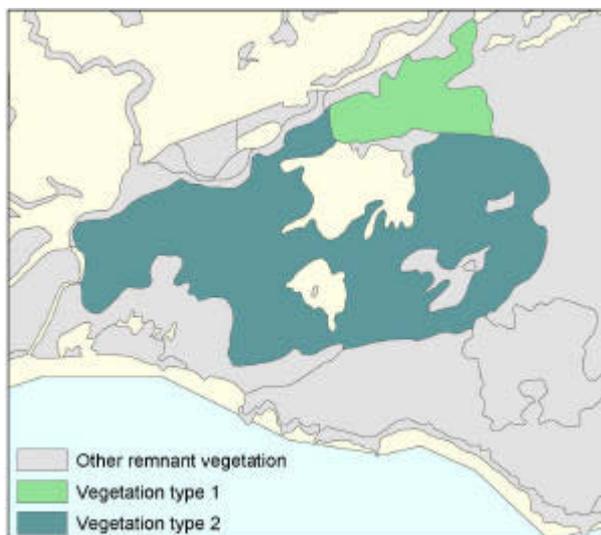
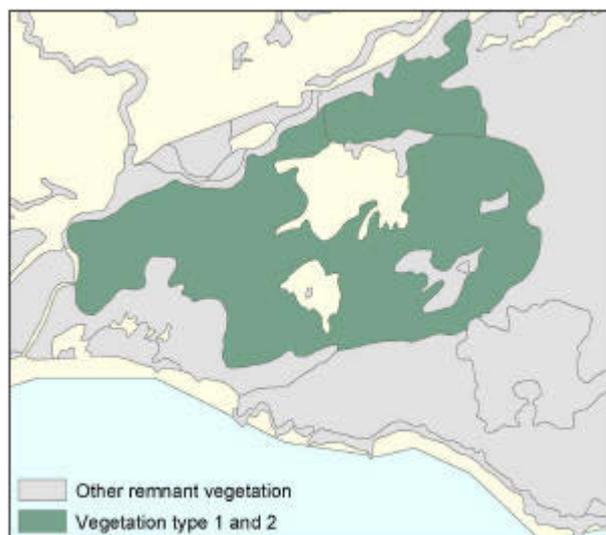


Figure 6: Vegetation types displayed at Level III



## How can this information be used?

These vegetation data sets can assist environmental planning in a number of ways. The overall extent of remnant native vegetation can be mapped or detailed vegetation types can be displayed. A primary use of the vegetation mapping is that of providing a reference point for the status of vegetation in South Australia. This information is required in South Australia for reporting on state and national monitoring and evaluation indicators.

Remnant and pre-European vegetation can be compared to highlight patterns of clearance. These vegetation data sets can be combined with other spatial data sets, such as threatened species data, environmental weed mapping and land use, to prioritise areas for on-ground works to achieve multiple NRM targets.

The case study below demonstrates how these data sets can be used to address the requirements of a natural resource management (NRM) target.

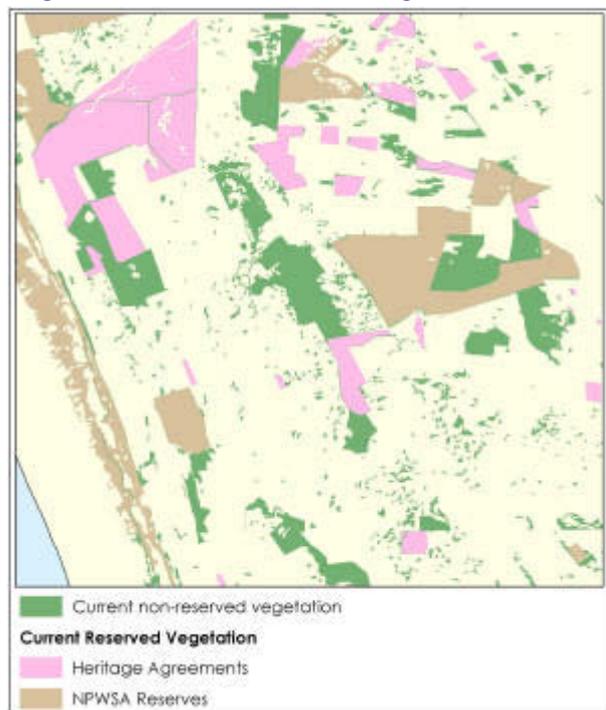


### Example: South East NRM Target

***Increase the area of native vegetation protected under Heritage Agreements by 3500 hectares by 2008.***

This example illustrates how vegetation mapping can assist in the planning processes required to achieve a target for the South East NRM region. The target aims to protect a further 3500 hectares of native vegetation under Heritage Agreements by 2008. The map in Figure 7 displays a small area within the South East NRM region. The pink areas represent native vegetation currently protected within a Heritage Agreement. The brown areas represent native vegetation protected within NPWSA Reserves. The areas of native vegetation that are not currently protected within a formal reserve system are represented in green. A simple spatial analysis revealed the total area of non-reserved native vegetation in the SE NRM region is 264,459 hectares. The NRM target requires only 3500 hectares (or 1.3%) of this vegetation to be protected within a Heritage Agreement by 2008. The information displayed in this map can be further analysed to identify the specific areas of native vegetation to protect within Heritage Agreements by 2008.

Figure 7: Reserve Status of Native Vegetation



## What are the limitations of the data?

Native vegetation mapping is not an exact science. The mapping is based on the extrapolation of point-based sampling and interpretation of aerial photography or satellite imagery. The limited precision of data extrapolation and imagery interpretation processes can lead to inaccuracies within the mapping. While some field checking is undertaken, it is not feasible to field check all patches of vegetation that are mapped.

In addition, native vegetation mapping is generally based on the dominant overstorey distinguishable from the aerial photography. As a result the understorey may vary in floristic composition to what is described. In particular, grasslands are difficult to identify and therefore are under represented in the mapping.

In terms of condition, the understorey may vary from relatively pristine to moderately degraded, or it may have been predominantly replaced by introduced plant species.



*Eucalyptus largiflorens*



Training survey volunteers

Native vegetation mapping has been undertaken using various scales of aerial photography (1:10,000, 1:25,000, 1:40,000, 1:80,000) and/or Landsat TM imagery (1:100,000 and 1:250,000) for agricultural and arid regions. This data must not be used at a scale finer than the original source (eg. if 1:40,000 then not less than 1:40,000).

While regional native vegetation mapping provides a regional perspective and is useful as a broad scale biodiversity or catchment planning tool, it does not replace the need for on-ground inspection for land management decision-making at the local level.

The pre-European vegetation mapping represents a broad perspective of the vegetation types that are likely to have occurred prior to settlement. The accuracy of the historical records and their interpretation limit the accuracy of the mapping. Historical records used for pre-European mapping, such as the Hundred Survey Books, can be variable and at various scales. Discrepancies may also be noted between current vegetation descriptions and pre-European descriptions. This may be due to differences in interpretation when defining vegetation types, or the discrepancies can reflect changes in land use that have resulted in selective clearance of particular plant species, or regrowth of others.

## Native vegetation data services and products

The current floristic and pre-European vegetation information is held and maintained by the Department for Environment and Heritage. A standard series of maps showing current or pre-European vegetation (where available), with landcover, roads, Heritage Agreement areas and NPWS reserves offer a good introduction to the information. For current vegetation, the *Floristic Vegetation Mapping of South Australia* maps are available for most areas represented in Figure 1 (page 2).

Pre-European vegetation maps are available for most areas represented in Figure 2 (page 2).

Contact Mapland on 8226 4946 for information about obtaining these maps.

## Related data sets

A number of vegetation data sets complement the remnant and pre-European vegetation mapping. These include:

- Vegetation survey site data
- Opportunistic flora sightings
- Rare and threatened flora
- Roadside vegetation

## Useful Links

These links provide more information on the following topics:

- NVIS  
<http://www.deh.gov.au/erin/nvis/>
- Vegetation Survey Methodology  
[http://www.environment.sa.gov.au/biodiversity/pdfs/vegetation\\_survey\\_manual.pdf](http://www.environment.sa.gov.au/biodiversity/pdfs/vegetation_survey_manual.pdf)
- Vertebrate Survey Methodology  
[http://www.environment.sa.gov.au/biodiversity/pdfs/vertebrate\\_survey\\_manual.pdf](http://www.environment.sa.gov.au/biodiversity/pdfs/vertebrate_survey_manual.pdf)



*Prasophyllum elatum*



*Eucalyptus viminalis*

### For further information please contact

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