

Regional ecosystems (REs) in Queensland are defined as vegetation communities that are consistently associated with a particular combination of geology, landform and soil in a bioregion. A bioregion is an area delineated by broad landscape patterns that reflect the major geological structure, climate patterns and broad groups of plants and animals. There are 1351 REs in 13 bioregions in Queensland.

## Uses

Regional ecosystem information is a practical tool when planning and assessing vegetation for conservation, planning and management on a regional basis. The combination of landform, geology, soils, climate and vegetation used to define regional ecosystems provides a useful classification system for biodiversity.

The classification of REs is used for vegetation management under the *Vegetation Management Act 1999* (VMA), in determining environmentally sensitive areas under the *Environmental Protection Act 1994* (EPA) and to ensure the conservation of biodiversity under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

## How are RE maps developed?

Regional ecosystems have been developed in a systematic way based on sound ecological principles. The Queensland Herbarium is the lead agency for vegetation survey and mapping in Queensland and has established an internationally recognised methodology for vegetation survey and mapping. This has developed from examining the extensive literature on the subject and conducting more than 30 years of mapping activity *Neldner et al.* (2005).

For the majority of Queensland the regional ecosystem maps are produced at 1:100 000 scale, which is the scale recommended for conservation management and regional resource inventory.

The two major mapping products of the Queensland Herbarium are maps (and digital coverages) of current remnant and pre-clearing regional ecosystems and vegetation. The remnant mapping shows the extent of

vegetation at the time of the imagery and is updated about every two years (current remnant mapping exists for 1995, 1997, 1999, 2000, 2001 and 2003). Fieldwork is conducted to validate the maps and involves the collection of quantitative site data for the classification and description of regional ecosystems and vegetation types.

## Remnant vegetation

Remnant vegetation mapping uses Landsat satellite imagery, in combination with recent aerial photography and field based ground truthing.

Remnant 'intact' vegetation has the tallest vegetation layer that is at least 70% of the height and 50% of the cover of the normal height and cover for that layer. This layer must be comprised of species characteristic of the vegetation's undisturbed predominant canopy. Vegetation that has been cleared in the past but now meets the above criteria, has similar conservation values and diversity to remnant vegetation.

Many examples of remnant vegetation are located in more or less undisturbed areas. These sites are often in reserves or areas where there has been no obvious disturbance to the dominant vegetation layer. These areas are used to define the attributes of undisturbed vegetation in the field. They are then related to Landsat images and aerial photo patterns so that remnant vegetation of each vegetation type can be identified across the whole landscape.

The finalised remnant map is overlaid with the pre-clearing regional ecosystem map to assign the ecosystem types to the remnant cover. Different rates of clearing of REs in 'mixed polygons' is taken into account. This final product makes up the information included in the RE mapping.

Non-remnant vegetation is all vegetation that is not mapped as remnant vegetation. This may include young regrowth, heavily thinned or logged and significantly disturbed vegetation that fails to meet the structural and/or floristic characteristics of remnant vegetation. It also includes urban and cropping land. Non-remnant vegetation may retain significant biodiversity values.

## Pre-clearing vegetation

Pre-clearing vegetation communities are drawn from 1960's aerial photos with the aid of any available land system, geology, soils, other land resource mapping as well as early surveyor's records. 1960's aerial photos are used because they are the earliest uniform state-wide coverage.

Photo interpretation is followed by extensive field sampling, ground truthing and data collection. This information is then collated and analysed before different photo patterns are assigned to different ecosystem types.

## Reading RE maps

RE maps are centred on the Lot on Plan or central coordinate provided with the request. To read a regional ecosystem map, first find the area of interest on the relevant map. The colours on the RE maps refer to specific regional ecosystem status (see Map 1). Light and dark pink indicate *endangered* vegetation (vegetation of which less than 10% remains as remnant). Light and dark orange indicate *of concern* vegetation (less than 30% remains). Green represents remnant vegetation that is *not of concern* and white represents areas where no remnant vegetation has been recorded.

Each area on the map is called a polygon. These areas are labelled with a three number code (for example 11.3.5). The first digit indicates the bioregion in which the regional ecosystem exists (for example, 11 is the code for the Brigalow Belt bioregion). The second digit relates to the land system on which the ecosystem occurs (for example 3 indicates an alluvial land system such as creeks, rivers, and floodplains). The last digit refers to the specific ecosystem (in this case, low woodland or open forest of *Acacia cambagei*). Full descriptions of REs can be found on [www.epa.qld.gov.au/REDD](http://www.epa.qld.gov.au/REDD).

Essential habitat is remnant vegetation in which a species listed under the Queensland *Nature Conservation Act 1992* has been known to occur that is endangered, vulnerable, rare or near threatened. The essential habitat of species is mapped by the Environmental Protection Agency (EPA) and shown on the second RE map in the PDF.

## "Mixed polygons" showing dominant and subdominant vegetation

Many of the regional ecosystem maps have areas with two or three regional ecosystem numbers, these areas are called heterogeneous or "mixed polygons". In mixed polygons,

several different regional ecosystems may be present each with an area too small to be mapped separately at a 1:100 000 scale. The regional ecosystems are listed in an order that reflects their proportions within the mosaic. For example: 12.12.23/12.8.14, 70/30 contains 70% of 12.12.23 and 30% of 12.8.14.

Where a mixed polygon includes a mixture of *endangered*, *of concern* or *not of concern* vegetation, the map will show different colours depending on whether the *endangered* or *of concern* vegetation is dominant or subdominant. *Endangered* and *of concern* will always take priority on the map, so that an area containing 20% *endangered* and 80% *not of concern* will be shown as light pink on the map.

## Ongoing refinement of regional ecosystem mapping

The survey and mapping processes aim to achieve a high level of accuracy of regional ecosystem coverage across Queensland. While the mapping gives a good regional perspective of the distribution and status of ecosystems, it is expected that property level inspections and property vegetation management plans will be used to update the mapping progressively. This information will be combined with monitoring of ongoing clearing, distribution maps and the conservation status of regional ecosystems.

The Queensland Herbarium provides a detailed analysis of regional ecosystems in Queensland every 2 years.

## What are the limitations?

The regional ecosystem framework has been developed on a regional basis at a scale of 1:100,000. This means that some of the vegetation that occurs at the property level is not represented on the map. Generally, vegetation less than 5 hectares (western Qld.) and 1 hectare (eastern Qld.) in area is too small to be identified by the current process of regional mapping.

A high level of variation may exist in the vegetation within an individual regional ecosystem. In conjunction with local governments, work is proceeding to map REs at a finer scale.

If a land owner believes that part of the property is mapped incorrectly, they should contact their nearest NRW office.

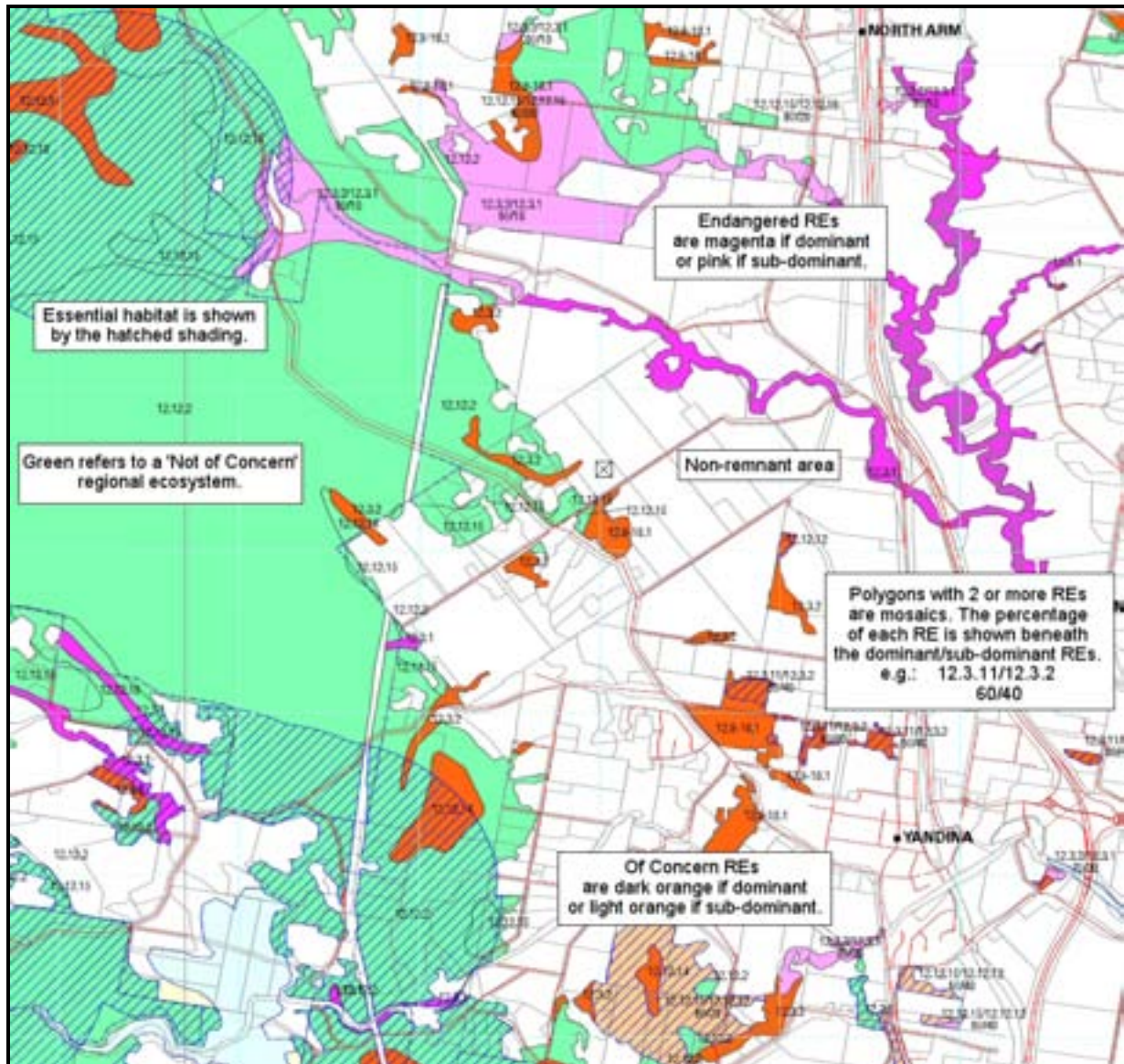
## Further information

Neldner, V.J., Wilson, B. A., Thompson, E.J. and Dillewaard, H.A. (2005) *Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland*. Version 3.1. Updated September 2005. Queensland Herbarium, Environmental Protection Agency.

PDF available from the EPA website:  
<http://www.epa.qld.gov.au/publications/>

Vegetation management information can be found on the NRW website:  
<http://www.nrw.qld.gov.au/vegetation/index.html> or from your District NRW office.

NRW [essential habitat](#) web page has information on how essential habitat is applied under the VMA Codes.



**Map 1.** An example of a Regional Ecosystem map (not to scale)  
Source: Queensland Herbarium, EPA.