Land Use in Australia – At a Glance

Land uses have a major effect on Australia's natural resources through their impacts on water, soil, nutrients, plants and animals. There is also a strong link between changing patterns of land use and economic and social conditions, particularly in regional Australia.

This pamphlet gives a brief outline of how land use is mapped in Australia and provides statistics showing the breakdown of land uses in Australia. For more detailed information on land use and access to land use data visit www.brs.gov.au/landuse.

What is land use?

Land use information shows how our land resources are used. This includes the production of goods (such as crops, timber and manufactures) and services (such as defence, recreation, biodiversity and natural resources protection).

Plantation forestry (ALUM class 3.2.0)

Cereals (ALUM class 3.3.1)

Glasshouses (hydroponic) (ALUM class 5.1.3)

There is often confusion between the terms 'land use' and 'land cover' because of the common use of remotely sensed data (either satellite or airborne) for mapping. The distinction between land use and land management practice is also poorly understood.

Land cover

Land cover refers to the physical surface of the earth, including various combinations of vegetation types, soils, exposed rocks and water bodies as well as anthropogenic elements, such as agriculture and built environments. Land cover classes can usually be discriminated by characteristic patterns using remote sensing.

Land use

Land use means the purpose to which the land cover is committed. Some land uses, such as agriculture, have a characteristic land cover pattern. These usually appear in land cover classifications. Other land uses, such as nature conservation, are not readily discriminated by a characteristic land cover pattern. For example, where the land cover is woodland, land use may be timber production or nature conservation.

Land management practice

Land management practice means the approach taken to achieve a land use outcome — the 'how' of land use (eg cultivation practices, such as minimum tillage and direct drilling). Some land management practices, such as stubble disposal practices and tillage rotation systems, may be discriminated by characteristic land cover patterns and linked to particular issues.

Land capability and land suitability

Land capability assesses the limitations to land use imposed by land characteristics and specifies management options. *Land suitability* (assessed as part of the process of land evaluation) is the fitness of a given type of land for a specified kind of use.

How land use is mapped

Land use mapping in Australia is conducted broadly at two scales: national scale and catchment scale (see Figure 1). Both land use mapping methods use the Australian Land Use and Management (ALUM) Classification system, which provides a nationally consistent method to collect and present land use information for a wide range of users across Australia. The Australian Collaborative Land Use Mapping Programme (ACLUMP) coordinates land use mapping in Australia to ensure consistent coverage at both 'national' and 'catchment' scale.

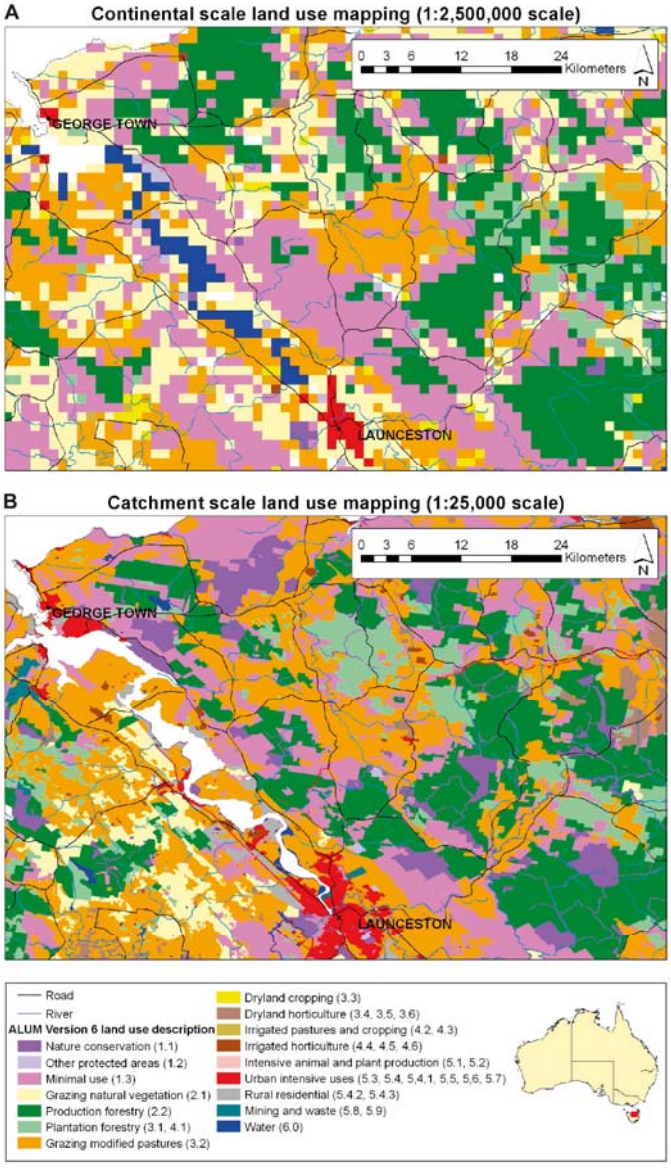

Figure 1 - Difference in scale and information contained in national (continental) scale and catchment scale land use maps in an area around Launceston in northern Tasmania.

A. A sample of national scale mapping near Launceston based on data captured at approximately 1:2,500,000 scale provides insufficient detail for use in catchment scale applications.

B. Catchment scale mapping captured at 1:25,000 scale of the same sample area near Launceston shows the greater detail provided by this finer scale mapping.

National scale (1:2,500,000) land use mapping gives an overview of land use mapping across the continent. National scale mapping uses a modelling approach to integrate Australian Bureau of Statistics agricultural commodity data, satellite imagery and other land use information.

Catchment scale land use mapping is more detailed than national scale mapping and is produced by combining state cadastre, public land databases, fine-scale satellite data, other land cover and use data, and information collected in the field. Catchment scale mapping can vary from 1:25,000 (where 1cm on the map = 250m on the ground) for irrigated and peri-urban areas, to 1:100,000 scale (1cm = 1km) for broadacre cropping regions, and 1:250,000 (1cm = 2.5km) for the semi-arid and arid pastoral zone.

Australia's land uses

The national land use picture for Australia described here is drawn from national scale mapping completed for 2001/02 (1:2,500,000). Due to the broad scale of this dataset, actual land areas should be used as a guide. Once catchment scale mapping is complete, more accurate land use information at the continental level will be available. Currently this information is only available at the state or regional level.

Figure 2 shows the land use in Australia for the 2001/02 year using a modelling approach based on agricultural statistics, satellite imagery and other land use information. Table 1 and Figure 3 show the breakdown of land uses by square kilometres and percentage area.

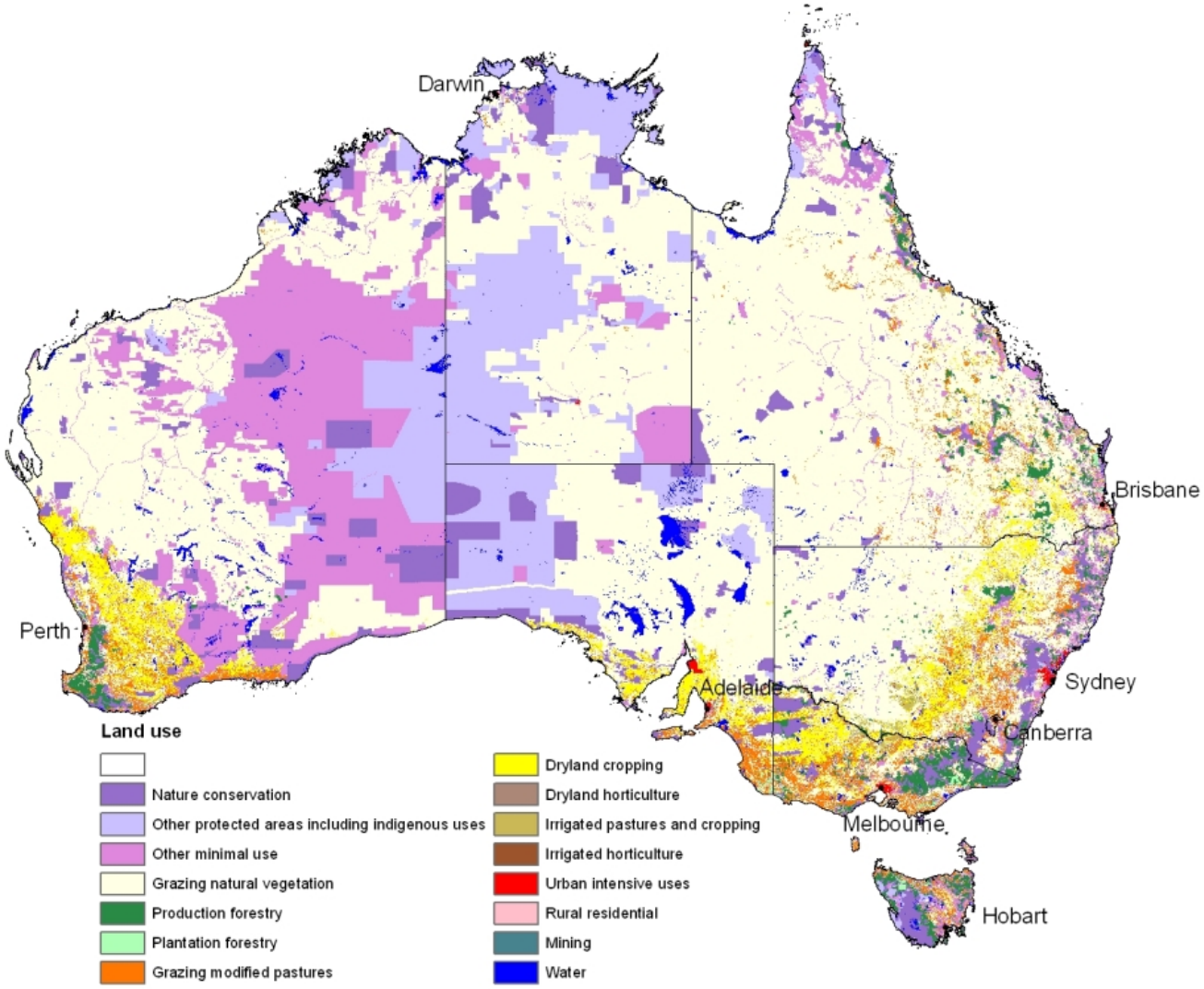

Figure 2. 2001/02 Land Use of Australia, Version 3 (Bureau of Rural Sciences)

According to this dataset, in 2001/02 the total area of land under primary production (livestock grazing, dryland and irrigated agriculture) was nearly 4.7 million square kilometres or 61% of the continent. The dominant land use in arid and semi-arid regions is livestock grazing on natural vegetation (4.2 million square kilometres or 55%). Grazing on modified pastures makes up 3% (or 229,000 square kilometres) of land uses.

Approximately 529,000 square kilometres or 7% of Australia is set aside to nature conservation. Other protected areas, including Indigenous uses, cover almost 1 million square kilometres (or 13%) of Australia.

Forestry tends to be confined to regions of Australia with higher rainfall and covers nearly 2% of the continent. The most intensive use is the built environment, which occupies about 14,000 square kilometres, or 0.2% of Australia.

Table 1. Land use in Australia (based on 2001/02 Land Use of Australia, Version 3, Bureau of Rural Sciences)

Land use	Area (sq. km)	Percent (%)
Nature conservation	529,380	6.89%
Other protected areas including Indigenous uses	985,749	12.82%
Minimal use	1,169,748	15.21%
Grazing natural vegetation	4,194,721	54.56%
Production forestry	133,064	1.73%
Plantation forestry	16,879	0.22%
Grazing modified pastures	229,349	2.98%
Dryland cropping	235,931	3.07%
Dryland horticulture	1,165	0.02%
Irrigated pastures and cropping	25,992	0.34%
Irrigated horticulture	4,543	0.06%
Rural residential	9,442	0.12%
Urban intensive uses	14,031	0.18%
Mining	1,366	0.02%
Water	134,869	1.75%
No data	2,274	0.03%
Total	**7,688,503**	**100.00%**

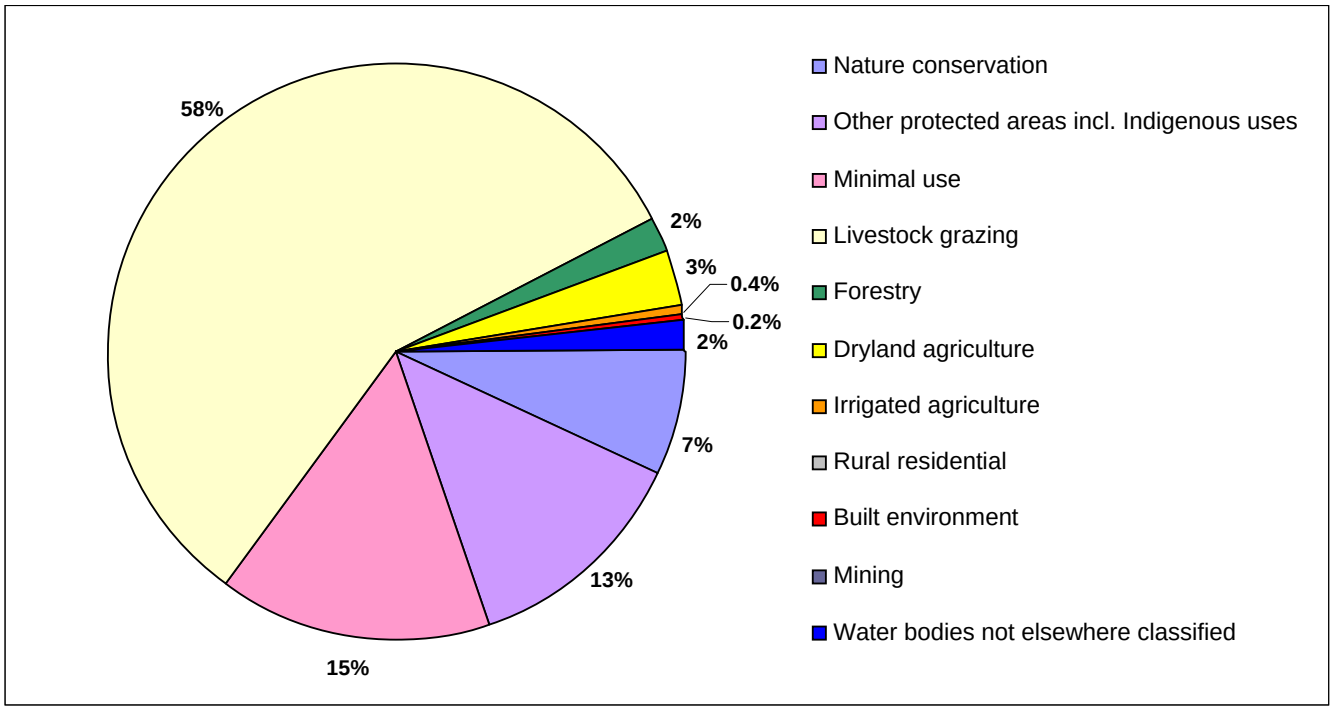

Figure 3. Land use in Australia (based on 2001/02 Land Use of Australia, Version 3, Bureau of Rural Sciences)

AUSTRALIAN LAND USE AND MANAGEMENT CLASSIFICATION version 6 (November 2005)

1 Conservation and Natural Environments

1.1.0 Nature conservation
- 1.1.1 Strict nature reserves
- 1.1.2 Wilderness area
- 1.1.3 National park
- 1.1.4 Natural feature protection
- 1.1.5 Habitat/species management area
- 1.1.6 Protected landscape
- 1.1.7 Other conserved area

1.2.0 Managed resource protection
- 1.2.1 Biodiversity
- 1.2.2 Surface water supply
- 1.2.3 Groundwater
- 1.2.4 Landscape
- 1.2.5 Traditional indigenous uses

1.3.0 Other minimal use
- 1.3.1 Defence
- 1.3.2 Stock route
- 1.3.3 Residual native cover
- 1.3.4 Rehabilitation

minimum level of attribution

2 Production from Relatively Natural Environments

2.1.0 Grazing natural vegetation

2.2.0 Production forestry
- 2.2.1 Wood production
- 2.2.2 Other forest production

3 Production from Dryland Agriculture and Plantations

3.1.0 Plantation forestry
- 3.1.1 Hardwood production
- 3.1.2 Softwood production
- 3.1.3 Other forest production
- 3.1.4 Environmental

3.2.0 Grazing modified pastures
- 3.2.1 Native/exotic pasture mosaic
- 3.2.2 Woody fodder plants
- 3.2.3 Pasture legumes
- 3.2.4 Pasture legume/grass mixtures
- 3.2.5 Sown grasses

3.3.0 Cropping
- 3.3.1 Cereals
- 3.3.2 Beverage & spice crops
- 3.3.3 Hay & silage
- 3.3.4 Oilseeds
- 3.3.5 Sugar
- 3.3.6 Cotton
- 3.3.7 Tobacco
- 3.3.8 Legumes

3.4.0 Perennial horticulture
- 3.4.1 Tree fruits
- 3.4.2 Oleaginous fruits
- 3.4.3 Tree nuts
- 3.4.4 Vine fruits
- 3.4.5 Shrub nuts fruits & berries
- 3.4.6 Flowers & bulbs
- 3.4.7 Vegetables & herbs

3.5.0 Seasonal horticulture
- 3.5.1 Fruits
- 3.5.2 Nuts
- 3.5.3 Flowers & bulbs
- 3.5.4 Vegetables & herbs

3.6.0 Land in transition
- 3.6.1 Degraded land
- 3.6.2 Abandoned land
- 3.6.3 Land under rehabilitation
- 3.6.4 No defined use

4 Production from Irrigated Agriculture and Plantations

4.1.0 Irrigated plantation forestry
- 4.1.1 Irrigated hardwood production
- 4.1.2 Irrigated softwood production
- 4.1.3 Irrigated other forest production
- 4.1.4 Irrigated environmental

4.2.0 Irrigated modified pastures
- 4.2.1 Irrigated woody fodder plants
- 4.2.2 Irrigated pasture legumes
- 4.2.3 Irrigated legume/grass mixtures
- 4.2.4 Irrigated sown grasses

4.3.0 Irrigated cropping
- 4.3.1 Irrigated cereals
- 4.3.2 Irrigated beverage & spice crops
- 4.3.3 Irrigated hay & silage
- 4.3.4 Irrigated oilseeds
- 4.3.5 Irrigated sugar
- 4.3.6 Irrigated cotton
- 4.3.7 Irrigated tobacco
- 4.3.8 Irrigated legumes

4.4.0 Irrigated perennial horticulture
- 4.4.1 Irrigated tree fruits
- 4.4.2 Irrigated oleaginous fruits
- 4.4.3 Irrigated tree nuts
- 4.4.4 Irrigated vine fruits
- 4.4.5 Irrigated shrub nuts fruits & berries
- 4.4.6 Irrigated flowers & bulbs
- 4.4.7 Irrigated vegetables & herbs

4.5.0 Irrigated seasonal horticulture
- 4.5.1 Irrigated fruits
- 4.5.2 Irrigated nuts
- 4.5.3 Irrigated flowers & bulbs
- 4.5.4 Irrigated vegetables & herbs

4.6.0 Irrigated land in transition
- 4.6.1 Degraded irrigated land
- 4.6.2 Abandoned irrigated land
- 4.6.3 Irrigated land under rehabilitation
- 4.6.4 No defined use (irrigation)

5 Intensive Uses

5.1.0 Intensive horticulture
- 5.1.1 Shadehouses
- 5.1.2 Glasshouses
- 5.1.3 Glasshouses (hydroponic)

5.2.0 Intensive animal production
- 5.2.1 Dairy
- 5.2.2 Cattle
- 5.2.3 Sheep
- 5.2.4 Poultry
- 5.2.5 Pigs
- 5.2.6 Aquaculture

5.3.0 Manufacturing and industrial

5.4.0 Residential
- 5.4.1 Urban residential
- 5.4.2 Rural residential
- 5.4.3 Rural living

5.5.0 Services
- 5.5.1 Commercial services
- 5.5.2 Public services
- 5.5.3 Recreation and culture
- 5.5.4 Defence facilities
- 5.5.5 Research facilities

5.6.0 Utilities
- 5.6.1 Electricity generation/transmission
- 5.6.2 Gas treatment, storage and transmission

5.7.0 Transport and communication
- 5.7.1 Airports/aerodromes
- 5.7.2 Roads
- 5.7.3 Railways
- 5.7.4 Ports and water transport
- 5.7.5 Navigation and communication

5.8.0 Mining
- 5.8.1 Mines
- 5.8.2 Quarries
- 5.8.3 Tailings

5.9.0 Waste treatment and disposal
- 5.9.1 Stormwater
- 5.9.2 Landfill
- 5.9.3 Solid garbage
- 5.9.4 Incinerators
- 5.9.5 Sewage

6 Water

6.1.0 Lake
- 6.1.1 Lake - conservation
- 6.1.2 Lake - production
- 6.1.3 Lake - intensive use

6.2.0 Reservoir/dam
- 6.2.1 Reservoir
- 6.2.2 Water storage - intensive use/farm dams
- 6.2.3 Evaporation basin
- 6.2.4 Effluent pond

6.3.0 River
- 6.3.1 River - conservation
- 6.3.2 River - production
- 6.3.3 River - intensive use

6.4.0 Channel/aqueduct
- 6.4.1 Supply channel/aqueduct
- 6.4.2 Drainage channel/aqueduct

6.5.0 Marsh/wetland
- 6.5.1 Marsh/wetland - conservation
- 6.5.2 Marsh/wetland - production
- 6.5.3 Marsh/wetland - intensive use

6.6.0 Estuary/coastal waters
- 6.6.1 Estuary/coastal waters - conservation
- 6.6.2 Estuary/coastal waters - production
- 6.6.3 Estuary/coastal waters - intensive use

AUSTRALIAN COLLABORATIVE LAND USE MAPPING PROGRAMME (ACLUMP)
www.brs.gov.au/landuse