

# Land Use Summary

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for the South East Queensland NRM region

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To access land use datasets it is recommended that the [Queensland Government Information Service](http://www.qgis.org/) (QGIS) be used. Search for "**land use mapping**" in the type of data search after restricting your search to "**cadastral and land planning**" in the topic category field. Metadata is also available from QGIS.

### Acknowledgements

We wish to acknowledge the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) who coordinate the Australian Collaborative Land Use and Management Program (ACLUMP).

The QLUMP team includes staff from DSITIA in Brisbane and four business centres of the Department of Natural Resource and Mines (DNRM) South Region. The input from the regions has been extremely valuable in respect of their mapping skills, local knowledge and capacity to engage regional experts in compiling updated land use mapping data.

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## Introduction

The [Queensland Land Use Mapping Program](#) (QLUMP) is a joint initiative of the Department of Science, Information Technology, Innovation and the Arts (DSITIA) and the Department of Natural Resources and Mines (DNRM). QLUMP is part of the [Australian Collaborative Land Use and Management Program](#) (ACLUMP) coordinated by the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES). ACLUMP promotes nationally consistent land use information.

Land use and land management practices have a profound impact on Queensland's natural resources, agricultural production and the environment. The availability of consistent and reliable spatial information regarding land use is critical for sustainable natural resource management by Australian, Queensland and local Governments, Natural Resource Management regional groups, industry groups, community groups and land managers.

QLUMP has updated land use mapping in the South-East Queensland (SEQ) Natural Resource Management Region to 2011 or later. Mapping has been compiled at the catchment level, with the exception of the Brisbane catchment, which has been divided into its sub-catchments (Brisbane River, Stanley River, Lockyer Creek and Bremer River) due to the size and diversity of the area. Apart from the Maroochy and Noosa catchments (2011) and the Brisbane River sub-catchment (2013), remaining catchments in SEQ were updated to 2012.

This report presents and summarises land use mapping in all catchments within SEQ NRM region, including:

- a revised 1999 land use dataset including improvements and corrections to the original
- updated (2011, 2012, 2013) land use dataset
- land use change dataset
- summary statistics derived from the above spatial datasets
- results of the accuracy assessment of the updated land use datasets

## Methodology

Mapping is performed in accordance with ACLUMP guidelines. The methodology is accurate, reliable, cost-effective, and makes best use of available databases, satellite imagery and aerial photography. QLUMP maps each catchment with the most recent suitable imagery available. The updated land use datasets for each catchment within SEQ range from 2011 to 2013.

The Australian Land Use and Management (ALUM) classification (Figure 1, page 5) shows five primary classes, identified in order of increasing levels of intervention or potential impact of land use; *water* is included separately as a sixth primary class. Within the primary classes is a [three-level hierarchical structure](#). Primary, secondary and tertiary levels broadly describe the potential degree of modification of or impact of land use on the landscape. The secondary level in the three-level hierarchical structure is the minimum attribution level for land use mapping in Queensland.

Primary and secondary levels relate to land use (i.e. the principal use of the land in terms of the objectives of the land manager). The tertiary level includes data on commodities or infrastructure, (e.g. crops such as cereals or infrastructure such as *urban residential*). Where possible, class attribution is performed to the tertiary level. For instance, QLUMP consistently maps land use classes *sugar* and *cotton* (dryland and irrigated) to tertiary level.

The mapping scale is 1:50,000 with a minimum mapping unit of two hectares and a width of 50 metres for linear features.

The 1999 (or later where available) baseline land use dataset formed the basis for the updated land use dataset. The 1999 land use map was revised and improved in addition to compiling an updated land use map. This was achieved primarily by interpretation of SPOT5 satellite imagery, high-resolution orthophotography, scanned aerial photography and inclusion of expert local knowledge. An ESRI ArcSDE geodatabase replication environment was utilised to overlay land use datasets on imagery and digitise or modify areas previously omitted or incorrectly mapped in the 1999 mapping, as well as areas of actual land use change. A land use change mapping product was then derived (at the secondary level of the ALUM classification).

Some land uses are difficult to differentiate using satellite imagery and existing databases, for example, dryland and irrigated *agriculture*. To overcome this, local expert knowledge was an important component of the mapping methodology. This was provided by regional staff in state government agencies, natural resource management groups, shires, agricultural industries and landholders. Field survey is also undertaken to verify areas of uncertainty in the land use mapping.

The land use mapping methods used by QLUMP are described in full in the ABARES handbook: [Guidelines for land use mapping in Australia: principles, procedures & definitions – Edition 4](#)

1 Conservation and Natural Environments	2 Production from Relatively Natural Environments	3 Production from Dryland Agriculture and Plantations	4 Production from Irrigated Agriculture and Plantations	5 Intensive Uses	6 Water
<b>1.1.0 Nature conservation</b> 1.1.1 Strict nature reserves 1.1.2 Wilderness areas 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  <b>1.2.0 Managed resource protection</b> 1.2.1 Biodiversity 1.2.2 Surface water supply 1.2.3 Groundwater 1.2.4 Landscape 1.2.5 Traditional Indigenous uses  <b>1.3.0 Other minimal use</b> 1.3.1 Defence land-natural areas 1.3.2 Stock route 1.3.3 Residual native cover 1.3.4 Rehabilitation	<b>2.1.0 Grazing native vegetation</b>  <b>2.2.0 Production forestry</b> 2.2.1 Wood production 2.2.2 Other forest production	<b>3.1.0 Plantation forestry</b> 3.1.1 Hardwood production 3.1.2 Softwood production 3.1.3 Other forest production 3.1.4 Environmental forest plantation  <b>3.2.0 Grazing modified pastures</b> 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  <b>3.3.0 Cropping</b> 3.3.1 Cereals 3.3.2 Beverage and spice crops 3.3.3 Hay and silage 3.3.4 Oil seeds 3.3.5 Sugar 3.3.6 Cotton 3.3.7 Alkaloid poppies 3.3.8 Pulses  <b>3.4.0 Perennial horticulture</b> 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 and berries 3.4.6 Perennial flowers and bulbs 3.4.7 Perennial vegetables and herbs 3.4.8 Citrus 3.4.9 Grapes  <b>3.5.0 Seasonal horticulture</b> 3.5.1 Seasonal fruits 3.5.2 Seasonal nuts 3.5.3 Seasonal flowers and bulbs 3.5.4 Seasonal vegetables and herbs  <b>3.6.0 Land in transition</b> 3.6.1 Degraded land 3.6.2 Abandoned land 3.6.3 Land under rehabilitation 3.6.4 No defined use 3.6.5 Abandoned perennial horticulture	<b>4.1.0 Irrigated plantation forestry</b> 4.1.1 Irrigated hardwood production 4.1.2 Irrigated softwood production 4.1.4 Irrigated other forest production 4.1.4 Irrigated environmental forest plantation  <b>4.2.0 Grazing irrigated modified pastures</b> 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  <b>4.3.0 Irrigated cropping</b> 4.3.1 Irrigated cereals 4.3.2 Irrigated beverage and spice crops 4.3.3 Irrigated hay and silage 4.3.4 Irrigated oil seeds 4.3.5 Irrigated sugar 4.3.6 Irrigated cotton 4.3.7 Irrigated alkaloid poppies 4.3.8 Irrigated pulses 4.3.9 Irrigated rice  <b>4.4.0 Irrigated perennial horticulture</b> 4.4.1 Irrigated tree fruits 4.4.2 Irrigated oleaginous fruits 4.4.4 Irrigated tree nuts 4.4.4 Irrigated vine fruits 4.4.5 Irrigated shrub nuts fruits and berries 4.4.6 Irrigated flowers and bulbs 4.4.7 Irrigated vegetables and herbs 4.4.8 Irrigated citrus 4.4.9 Irrigated grapes  <b>4.5.0 Irrigated seasonal horticulture</b> 4.5.1 Irrigated fruits 4.5.2 Irrigated nuts 4.5.3 Irrigated flowers and bulbs 4.5.4 Irrigated vegetables and herbs 4.5.5 Irrigated turf farming  <b>4.6.0 Irrigated land in transition</b> 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) 4.6.5 Abandoned irrigated perennial horticulture	<b>5.1.0 Intensive horticulture</b> 5.1.1 Glasshouses 5.1.2 Glasshouses 5.1.3 Glasshouses (hydroponic) 5.1.4 Abandoned intensive horticulture  <b>5.2.0 Intensive animal husbandry</b> 5.2.1 Dairy sheds/yard 5.2.2 Cattle feedlots 5.2.3 Sheep feedlots 5.2.4 Poultry farms 5.2.5 Piggeries 5.2.6 Aquaculture 5.2.7 Horse studs 5.2.8 Stockyards/saleyards 5.2.9 Abandoned intensive animal husbandry  <b>5.3.0 Manufacturing and industrial</b> 5.3.1 General purpose factory 5.3.2 Food processing factory 5.3.3 Major industrial complex 5.3.4 Bulk grain storage 5.3.5 Abattoirs 5.3.6 Oil refinery 5.3.7 Sawmill 5.3.8 Abandoned manufacturing/industrial  <b>5.4.0 Residential and farm infrastructure</b> 5.4.1 Urban residential 5.4.2 Rural residential with agriculture 5.4.3 Rural residential without agriculture 5.4.4 Remote communities 5.4.5 Farm buildings/infrastructure  <b>5.5.0 Services</b> 5.5.1 Commercial services 5.5.2 Public services 5.5.3 Recreation and culture 5.5.4 Defence facilities-urban 5.5.5 Research facilities  <b>5.6.0 Utilities</b> 5.6.1 Fuel powered electricity generation 5.6.2 Hydro electricity generation 5.6.3 Wind farm electricity generation 5.6.4 Electricity substations and transmission 5.6.5 Gas treatment, storage and transmission 5.6.6 Water extraction and transmission  <b>5.7.0 Transport and communication</b> 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  <b>5.8.0 Mining</b> 5.8.1 Mines 5.8.2 Quarries 5.8.3 Tallings 5.8.4 Extractive industry not in use  <b>5.9.0 Waste treatment and disposal</b> 5.9.1 Effluent pond 5.9.2 Landfill 5.9.3 Solid garbage 5.9.4 Incinerators 5.9.5 Sewage/coverage	<b>6.1.0 Lake</b> 6.1.1 Lake-conservation 6.1.2 Lake-production 6.1.3 Lake-intensive use 6.1.4 Lake-saline  <b>6.2.0 Reservoir/dam</b> 6.2.1 Reservoir 6.2.2 Water storage-intensive use/ farm dams 6.2.3 Evaporation basin  <b>6.3.0 River</b> 6.3.1 River-conservation 6.3.2 River-production 6.3.3 River-intensive use  <b>6.4.0 Channel/aqueduct</b> 6.4.1 Supply channel/aqueduct 6.4.2 Drainage channel/aqueduct 6.4.3 Stormwater  <b>6.5.0 Marsh/wetland</b> 6.5.1 Marsh/wetland-conservation 6.5.2 Marsh/wetland-production 6.5.3 Marsh/wetland-intensive use 6.5.4 Marshland-saline  <b>6.6.0 Estuary/coastal waters</b> 6.6.1 Estuary/coastal waters-conservation 6.6.2 Estuary/coastal waters-production 6.6.3 Estuary/coastal waters-intensive use
Minimum level of attribution					

Figure 1: Australian Land Use and Management (ALUM) classification, Version 7

## Data Limitations

Land use features that are linear, such as roads and railways, are not mappable at a scale of 1:50,000 with a specified minimum mapping width of 50 metres. As a result, the area estimates of these **linear features** represent only a small proportion of the actual area within this land use type in Queensland. This is of relevance to the following land use classes:

- *transport and communication*
- *utilities*
- *rivers*

Similarly, land uses that fall under the QLUMP minimum mapping area of two hectares are not explicitly mapped but aggregated into the surrounding land use class. This will have the effect of over-estimating the area of some land use classes, for example *other minimal use* and *grazing native vegetation*, whereby tracks and farm infrastructure, road reserves, drainage lines, cleared and uncleared land adjacent to rivers as well as land immediately adjacent to or between cropped paddocks, are included.

Livestock grazing occurs on a range of pasture types including native and exotic as well as mixtures of both. Identifying and separating these using imagery, aerial photography and field observation is difficult and unreliable. Therefore, the ALUM secondary classes of *grazing modified pastures* and *irrigated grazing modified pastures* have not been mapped explicitly by QLUMP. Where possible (for example, with the benefit of field verification), these classes can be mapped (for example, dairy pastures and fodder crops). Areas of pasture which appeared to be harvested for fodder or grazed off were mapped as *cropping*. This may contribute an over-estimation of cropping in the region. The appearance of these can be highly variable and classification may therefore not be consistent.

The distinction between (dryland) *cropping* and *irrigated cropping* was not always evident and it is likely there is some misclassification in these classes. Proximity to water sources (watercourse or dam) as well as information from water entitlements (irrigation licences), field survey and local knowledge were used to confirm areas of irrigation as much as possible. Areas mapped as *irrigated cropping* are potentially irrigated on a supplementary basis and may not have actually been irrigated in 1999, 2011, 2012 or 2013.

The *rural residential* land use class is a source of possible thematic error. Properties on the fringes of suburban settlements, hobby farms and subdivisions in isolated localities with comparatively small lot sizes were mapped to this class. The use of Queensland Valuation System (QVAS) (valuation information) was helpful in mapping this class, based on whether or not the land owner was classified as a primary producer. Residential features greater than 0.2 hectares and less than 16 hectares were mapped as *rural residential*. This class may be misclassified with *grazing native vegetation* and *other minimal use*, especially on larger properties.

A combination of the Queensland Herbarium's [wetlands](#) and [regional ecosystem](#) datasets provided the basis for mapping *marsh/wetlands*, *lakes*, *rivers* and *reservoir/dams*. The ephemeral nature of many of these water features can lead to confusion insofar as they may be present in imagery of one date and either absent or of differing extent in imagery of subsequent or previous dates. As a result, there may be errors, omissions and disagreement in the mapping of features such as farm dams, reservoirs, lakes, wetlands and other water features. Many water features, whilst exceeding the minimum mappable area requirements, do not meet the criteria for linear or uniform features.

The 1999 and updated land use datasets are a snapshot of what was interpreted as the primary land use in these years. However, effort was given to distinguishing between an actual land use change and a rotation. For example, an area that is usually cropped, but is not used for that particular purpose in the year of interest, was still mapped as *cropping* in the updated dataset even though no crop was present in that year. This was not considered an actual land use change, but rather a rotation, as the primary land use for that paddock would still be *cropping*.

Refer to metadata for details on the mapping of specific classes.

## Products

### 1999 and updated land use datasets

Figure 2 (page 8) and Figure 3 (page 9) show the 1999 and updated land use datasets respectively, for the SEQ NRM region, presented at the secondary level of the ALUM classification (Figure 1, page 5). Note that Figure 3 also shows an inset map which presents the currency (mapping year) of the updated land use datasets. Table 1 (page 10) and Table 2 (page 11) provide the summary statistics for each. All statistics presenting the area of land use classes are reported in hectares (ha).

Table 2 (page 11) shows that *grazing native vegetation* (48%) followed by *nature conservation* (12%) and *residential and farm infrastructure* (12%) are the major secondary land use classes for the updated land use in SEQ.

Analysis of the overall change between land use classes shows that at the primary level of the ALUM classification, the *conservation and natural environments* and *intensive uses* land use classes have increased by 23% or 97,044ha and 9% or 32,527ha respectively. All other primary land use classes have decreased since 1999.

As a result of the SEQ Forest Agreement, (whereby state forests have been progressively added to the conservation reserves estates), the secondary class of *nature conservation* increased by 64% or 115,024ha, whilst *managed resource protection* increased by 90% or 15,895ha.

The *other minimal use* secondary land use class decreased by 15% or 33,874ha, the majority of which at the tertiary level was *residual native vegetation* (30,182ha). *Grazing native vegetation* decreased by 3% or 34,340ha.

Since 1999, the *intensive uses* primary land use class has increased by 9% or 32,527ha. The majority of the growth (74%) was observed in the *residential and farm infrastructure* secondary land use class, which increased by 9% or 23,921ha.

Analysis of the specific land use changes from one secondary class to another is presented in the section on page 12.

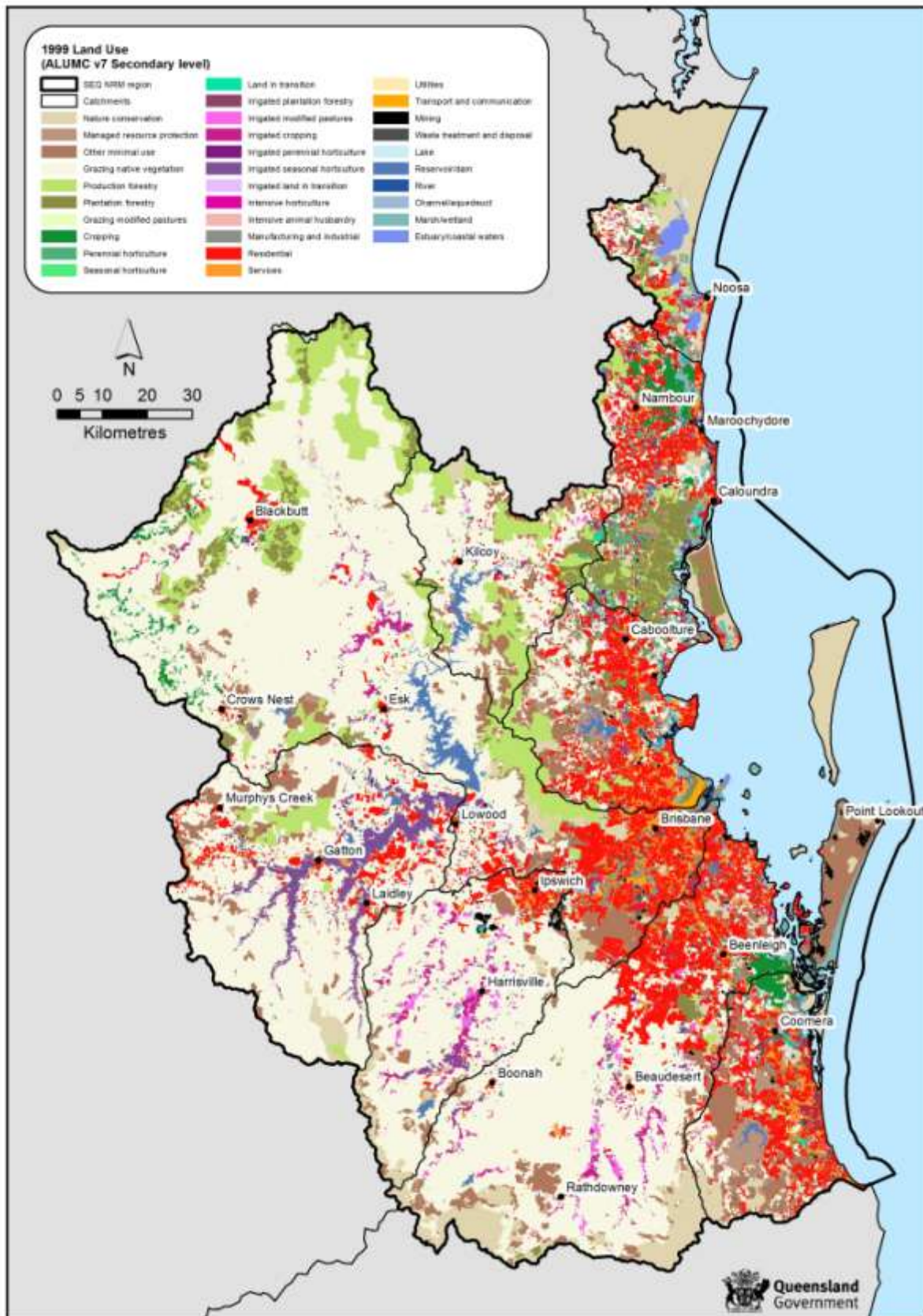


Figure 2: 1999 land use map for the SEQ NRM region



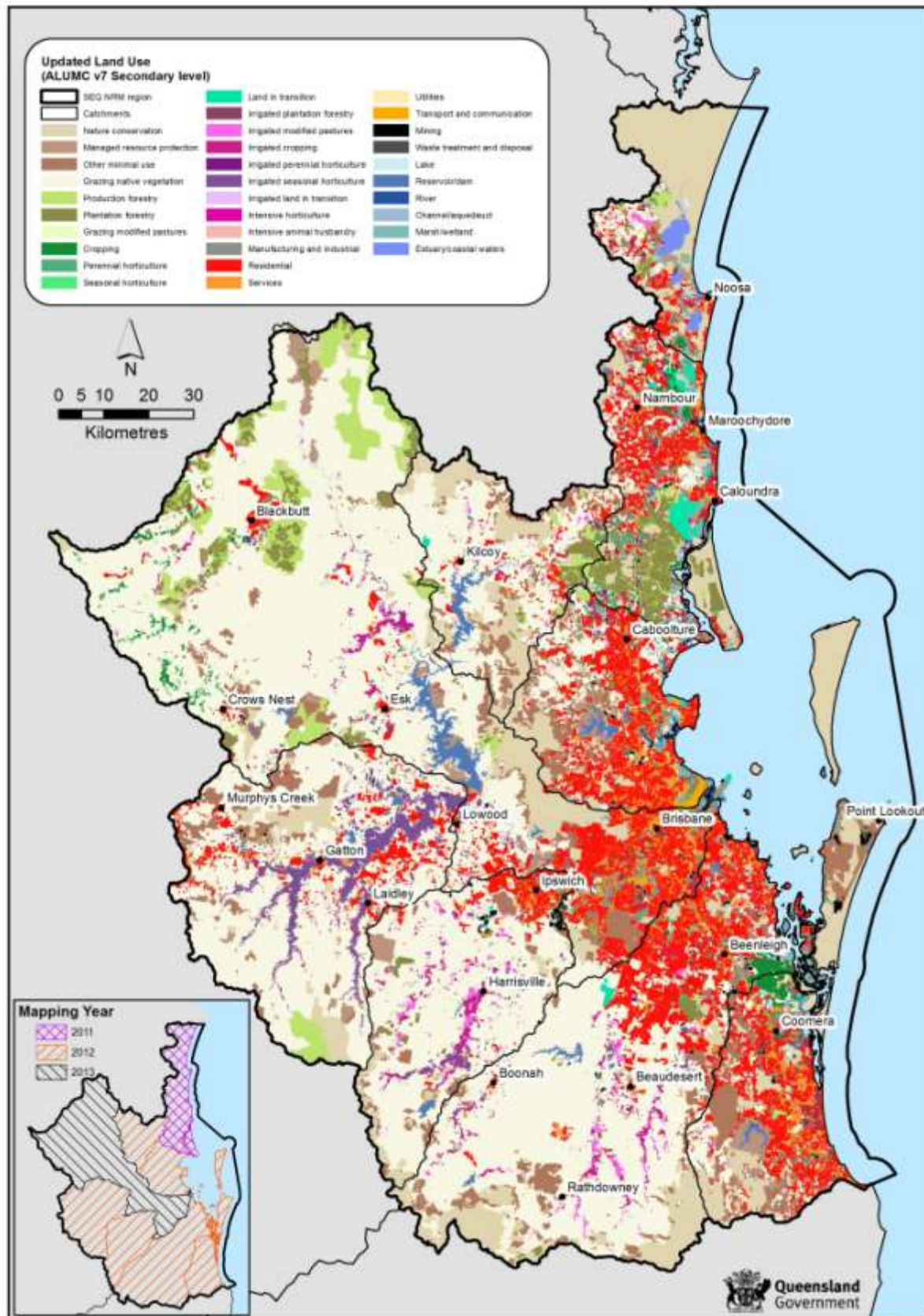


Figure 3: Updated (2011, 2012, 2013) land use map for the SEQ NRM region

**Table 1: Summary statistics of land use in 1999 in the SEQ NRM region**

Land use code	Land use class	Area (ha)	Area %
1	Conservation and natural environments	422,833	17.93
1.1	Nature conservation	178,712	7.58
1.2	Managed resource protection	17,685	0.75
1.3	Other minimal use	226,436	9.60
2	Production from relatively natural environments	1,314,237	55.73
2.1	Grazing native vegetation <sup>1</sup>	1,160,378	49.21
2.2	Production forestry	153,860	6.52
3	Production from dryland agriculture and plantations	109,859	4.66
3.1	Plantation forestry	59,907	2.54
3.2	Grazing modified pastures <sup>2</sup>	7,453	0.32
3.3	Cropping	28,606	1.21
3.3.5	Cropping – sugar <sup>3</sup>	17,652	0.75
3.4	Perennial horticulture	10,587	0.45
3.5	Seasonal horticulture	104	<0.01
3.6	Land in transition	3,202	0.14
4	Production from irrigated agriculture and plantations	78,029	3.31
4.1	Irrigated plantation forestry	144	0.01
4.2	Irrigated grazing modified pastures <sup>2</sup>	11,647	0.49
4.3	Irrigated cropping	26,836	1.14
4.3.5	Irrigated cropping – sugar <sup>3</sup>	19	<0.01
4.4	Irrigated perennial horticulture	4,830	0.20
4.5	Irrigated seasonal horticulture	34,562	1.47
4.6	Irrigated land in transition	8	<0.01
5	Intensive uses	347,006	14.72
5.1	Intensive horticulture	1,107	0.05
5.2	Intensive animal husbandry	3,767	0.16
5.3	Manufacturing and industrial	8,817	0.37
5.4	Residential and farm infrastructure	265,109	11.24
5.5	Services	47,150	2.00
5.6	Utilities	1,237	0.05
5.7	Transport and communication	10,046	0.43
5.8	Mining	8,088	0.34
5.9	Waste treatment and disposal	1,686	0.07
6	Water	86,182	3.65
6.1	Lake	984	0.04
6.2	Reservoir/dam	28,970	1.23
6.3	River	11,400	0.48
6.4	Channel/aqueduct	217	0.01
6.5	Marsh/wetland	36,958	1.57
6.6	Estuary/coastal waters	7,654	0.32
<b>Grand Total</b>		<b>2,358,148</b>	<b>100.00</b>

<sup>1</sup>grazing native vegetation includes all pastures (modified and unmodified). No distinction is made in respect of tree cover.

<sup>2</sup>grazing modified pastures and irrigated grazing modified pastures are not mapped explicitly. In this case the areas mapped are generally dairy pastures.

<sup>3</sup>the area of cropping – sugar and irrigated cropping – sugar is a subset of the total area of cropping and irrigated cropping respectively.

**Table 2: Summary statistics of updated (2011, 2012, 2013) land use in the SEQ NRM region**

Land use code	Land use class	Area (ha)	Area %
1	Conservation and natural environments	519,877	22.05
1.1	Nature conservation	293,736	12.46
1.2	Managed resource protection	33,579	1.42
1.3	Other minimal use	192,562	8.17
2	Production from relatively natural environments	1,197,275	50.77
2.1	Grazing native vegetation <sup>1</sup>	1,126,037	47.75
2.2	Production forestry	71,238	3.02
3	Production from dryland agriculture and plantations	107,228	4.55
3.1	Plantation forestry	57,973	2.46
3.2	Grazing modified pastures <sup>2</sup>	8,451	0.36
3.3	Cropping	18,351	0.78
3.3.5	Cropping – sugar <sup>3</sup>	10,285	0.44
3.4	Perennial horticulture	8,608	0.37
3.5	Seasonal horticulture	72	<0.01
3.6	Land in transition	13,773	0.58
4	Production from irrigated agriculture and plantations	72,750	3.09
4.1	Irrigated plantation forestry	241	0.01
4.2	Irrigated grazing modified pastures <sup>2</sup>	10,485	0.44
4.3	Irrigated cropping	22,256	0.94
4.3.5	Irrigated cropping – sugar <sup>3</sup>	23	<0.01
4.4	Irrigated perennial horticulture	5,380	0.23
4.5	Irrigated seasonal horticulture	34,340	1.46
4.6	Irrigated land in transition	49	<0.01
5	Intensive uses	379,533	16.09
5.1	Intensive horticulture	1,397	0.06
5.2	Intensive animal husbandry	4,894	0.21
5.3	Manufacturing and industrial	10,668	0.45
5.4	Residential and farm infrastructure	289,030	12.26
5.5	Services	52,450	2.22
5.6	Utilities	1,439	0.06
5.7	Transport and communication	10,712	0.45
5.8	Mining	6,937	0.29
5.9	Waste treatment and disposal	2,006	0.09
6	Water	81,485	3.46
6.1	Lake	1,092	0.05
6.2	Reservoir/dam	30,841	1.31
6.3	River	11,544	0.49
6.4	Channel/aqueduct	221	0.01
6.5	Marsh/wetland	30,368	1.29
6.6	Estuary/coastal waters	7,419	0.31
<b>Grand Total</b>		<b>2,358,148</b>	<b>100.00</b>

<sup>1</sup>grazing native vegetation includes all pastures (modified and unmodified). No distinction is made in respect of tree cover.

<sup>2</sup>grazing modified pastures and irrigated grazing modified pastures are not mapped explicitly. In this case the areas mapped are generally dairy pastures.

<sup>3</sup>the area of cropping – sugar and irrigated cropping – sugar is a subset of the total area of cropping and irrigated cropping respectively.

## Land use change dataset

Figure 4 (page 14), shows the land use change dataset for the SEQ NRM region. The data has been presented relative to the **change in intensity** of the land use at the secondary level of the ALUM classification.

For example, change from 2.1.0 (*grazing native vegetation*) to 2.2.0 (*production forestry*) is an increase in land use intensity, whilst change from 2.1.0 (*grazing native vegetation*) to 1.1.0 (*nature conservation*) is a decrease. This is highlighted in the ALUM classification (Figure 1, page 5). Moving down and from left to right through the classification, the level of intervention or potential impact of land use increases.

The total area of land use change at the secondary level from 1999 is 243,923ha. This is equivalent to 10.3% of the region. Of this, 74,366ha (30% of the total change) is an increase in land use intensity, whilst 169,557ha (70%) is a decrease.

The land use changes at secondary level of the ALUM classification are summarised in Table 3 (page 13). This table illustrates the land use change between 1999 and the updated land use mapping, summarised by primary land use class. For example, 17,449ha of *production from relative natural environments* changes to *intensive uses* (more intense), whilst 103,344ha changed to the *conservation and natural environments* (less intense) land use class. Also presented are the land use changes at secondary level within each primary class, for example 2,415ha of land use change occurred within the *intensive uses* primary land use class.

Summary statistics presenting the land use change at the secondary level are shown in Table 4 (page 15). The significant land use change from *production forestry* to *nature conservation* (82,267ha or 34% of total change) can be attributed to the SEQ Forest Agreement, as State forests in SEQ have been progressively added to the conservation reserves estates.

Other significant land use changes were from *grazing native vegetation* (13,301ha) and *other minimal use* (8,369ha) to *residential and farm infrastructure*. Collectively, expansion of the intensive land use classes including *manufacturing and industrial, residential and farm infrastructure, services, utilities, transport and communications* and *waste treatment and disposal* accounted for 35,624ha or 15% of the land use change in SEQ. Of this, 11,801ha or 33% was from the *other minimal use* class (which at the tertiary level is predominately (87%) *residual native vegetation*), whilst 15,876ha (45%) came from *grazing native vegetation*.

Land use changes to the *land in transition* class, in which the land use is identified as transitioning from one land use class to another, can largely be accounted for in the residential property development—Caloundra South. This area was mapped in 1999 as *plantation forestry* and *cropping – sugar*. It is no longer being managed in respect of either of these former land uses, as it awaits residential development. Interestingly, some 233ha of *estuary/coastal waters* in 1999 has changed to *land in transition* in the updated land use mapping. This is due to the expansion of the port infrastructure at the Port of Brisbane, where land reclamation works are in progress.

The 1,675ha of *grazing native vegetation* which has changed to *reservoir/dam* in the updated land use map is a result of the Wyaralong dam in the Logan-Albert catchment, which was completed in 2011.

**Table 3: Summary statistics for land use change at secondary level within SEQ, summarised by primary land use class**

Primary Land use		Updated (2011, 2012, 2013) Land use						Grand Total
		Conservation and natural environments	Production from relatively natural environments	Production from dryland agriculture and plantations	Production from irrigated agriculture and plantations	Intensive uses	Water	
1999 Land use	Conservation and natural environments	29,912	806	1,763	70	13,035	268	<b>45,853</b>
	Production from relatively natural environments	103,344	6,381	10,454	4,612	17,449	1,727	<b>143,967</b>
	Production from dryland agriculture and plantations	1,170	10,677	8,004	1,458	4,911	42	<b>26,262</b>
	Production from irrigated agriculture and plantations	177	8,264	1,779	1,948	1,466	65	<b>13,699</b>
	Intensive uses	1,822	870	1,322	320	2,415	248	<b>6,997</b>
	Water	6,474	8	309	16	239	96	<b>7,142</b>
	<b>Grand Total</b>	<b>142,899</b>	<b>27,006</b>	<b>23,631</b>	<b>8,423</b>	<b>39,517</b>	<b>2,445</b>	<b>243,920</b>

The figures shown in the diagonal represent the land use change at secondary level of the ALUM classification for each primary land use class. For example 2,415ha of land use change occurred within the *intensive uses* primary land use class. Refer to the ALUM classification (Figure 1, page 5) for secondary land use classes.

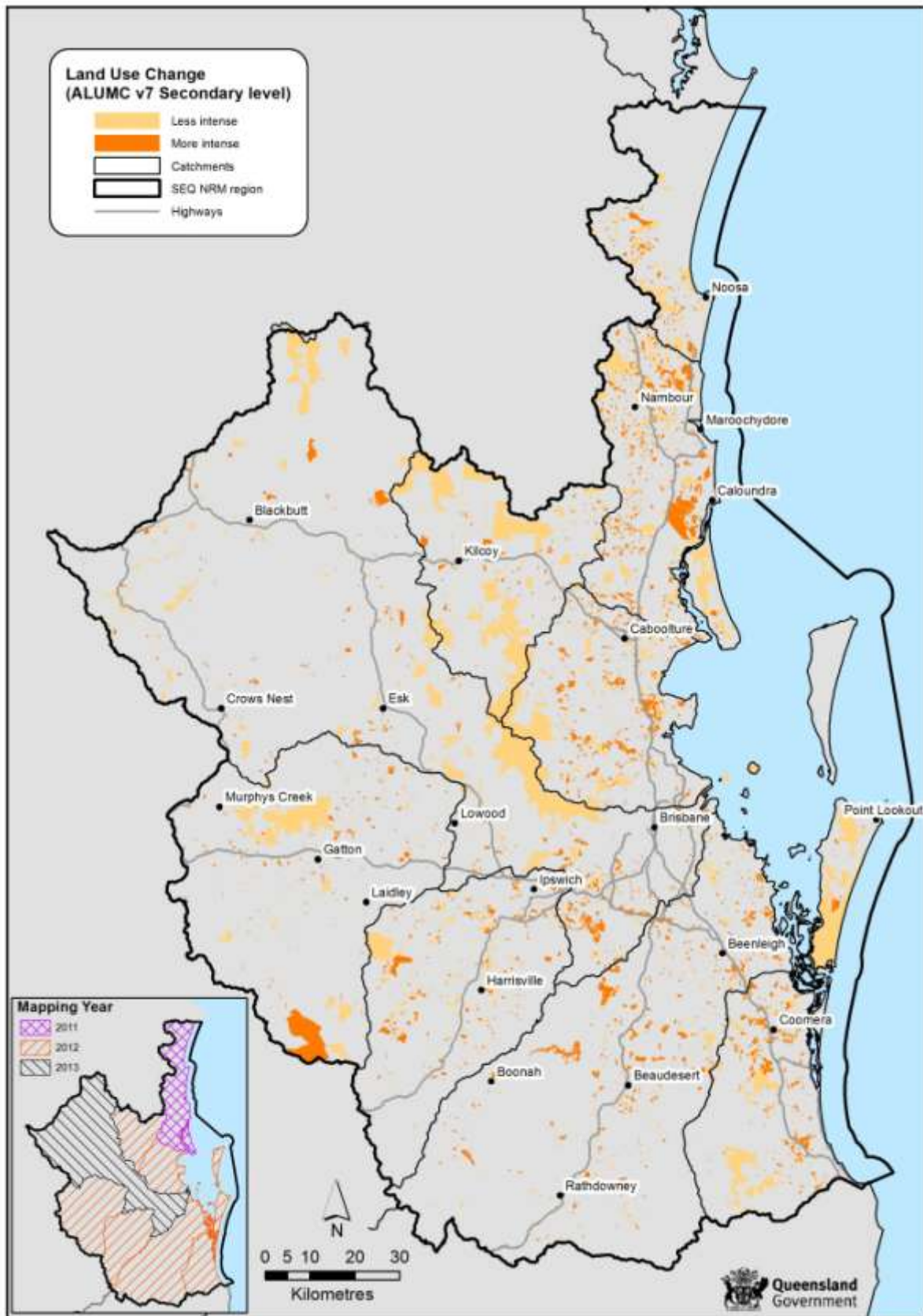


Figure 4: Land use change map from 1999 at secondary level for the SEQ NRM region

**Table 4: Summary statistics for land use change from 1999 at secondary level in the SEQ NRM region (showing only the land use changes > 700ha)**

Land use code 1999	Land use class 1999	Land use code updated	Land use class updated	Area (ha)	Area Change (%)	Total change (%)
2.2.0	Production forestry	1.1.0	Nature conservation	82,267	3.49	33.73
1.3.0	Other minimal use	1.1.0	Nature conservation	17,881	0.76	7.33
2.1.0	Grazing native vegetation	5.4.0	Residential & farm infrastructure	13,301	0.56	5.45
2.1.0	Grazing native vegetation	1.2.0	Managed resource protection	10,956	0.46	4.49
1.3.0	Other minimal use	5.4.0	Residential & farm infrastructure	8,369	0.35	3.43
1.2.0	Managed resource protection	1.1.0	Nature conservation	6,934	0.29	2.84
2.2.0	Production forestry	1.2.0	Managed resource protection	6,652	0.28	2.73
2.1.0	Grazing native vegetation	2.2.0	Production forestry	6,381	0.27	2.62
6.5.0	Marsh/wetland	1.1.0	Nature conservation	6,228	0.26	2.55
2.1.0	Grazing native vegetation	3.1.0	Plantation forestry	4,603	0.20	1.89
4.3.0	Irrigation cropping	2.1.0	Grazing native vegetation	4,485	0.19	1.84
1.3.0	Other minimal use	1.2.0	Managed resource protection	4,428	0.19	1.82
3.1.0	Plantation forestry	3.6.0	Land in transition	3,999	0.17	1.64
2.1.0	Grazing native vegetation	3.6.0	Land in transition	3,346	0.14	1.37
3.3.0	Cropping	2.1.0	Grazing native vegetation	3,156	0.13	1.29
3.3.5	Cropping – sugar	2.1.0	Grazing native vegetation	2,806	0.12	1.15
3.3.5	Cropping – sugar	3.6.0	Land in transition	2,210	0.09	0.91
4.2.0	Irrigated modified pastures	2.1.0	Grazing native vegetation	2,200	0.09	0.90
2.1.0	Grazing native vegetation	1.3.0	Other minimal use	2,160	0.09	0.89
2.1.0	Grazing native vegetation	5.5.0	Services	1,992	0.08	0.82
1.3.0	Other minimal use	5.5.0	Services	1,876	0.08	0.77
3.4.0	Perennial horticulture	2.1.0	Grazing native vegetation	1,784	0.08	0.73
2.1.0	Grazing native vegetation	6.2.0	Reservoir/dam	1,675	0.07	0.69
3.1.0	Plantation forestry	2.1.0	Grazing native vegetation	1,669	0.07	0.68
2.1.0	Grazing native vegetation	4.3.0	Irrigated cropping	1,580	0.07	0.65
1.3.0	Other minimal use	3.6.0	Land in transition	1,432	0.06	0.59
4.5.0	Irrigated seasonal horticulture	2.1.0	Grazing native vegetation	1,278	0.05	0.52
3.6.0	Land in transition	5.4.0	Residential & farm infrastructure	1,228	0.05	0.50
2.1.0	Grazing native vegetation	4.2.0	Irrigated modified pastures	1,208	0.05	0.50
1.3.0	Other minimal use	5.3.0	Manufacturing and industrial	1,116	0.05	0.46
2.1.0	Grazing native vegetation	1.1.0	Nature conservation	1,056	0.04	0.43
2.1.0	Grazing native vegetation	4.5.0	Irrigated seasonal horticulture	1,038	0.04	0.43
2.1.0	Grazing native vegetation	3.4.0	Perennial horticulture	1,005	0.04	0.41
3.4.0	Perennial horticulture	5.4.0	Residential & farm infrastructure	974	0.04	0.40
1.3.0	Other minimal use	5.8.0	Mining	908	0.04	0.37
2.1.0	Grazing modified pastures	2.1.0	Grazing native vegetation	838	0.04	0.34
1.3.0	Other minimal use	2.1.0	Grazing native vegetation	806	0.03	0.33
5.8.0	Mining	1.1.0	Nature conservation	774	0.03	0.32
2.1.0	Grazing native vegetation	3.2.0	Grazing modified pastures	746	0.03	0.31
4.3.0	Irrigated cropping	4.2.0	Irrigated modified pastures	735	0.03	0.30
2.1.0	Grazing native vegetation	5.2.0	Intensive animal husbandry	729	0.03	0.30
<b>Total</b>				<b>243,923</b>	<b>10.34</b>	<b>100</b>

## Data format and availability

### Download land use datasets

To access land use datasets it is recommended that the [Queensland Government Information Service](#) (QGIS) be used. Search for "**land use mapping**" in the type of data search after restricting your search to "**cadastral and land planning**" in the topic category field. Metadata is also available from QGIS.

The dataset comprises an ESRI vector geodatabase at a nominal scale of 1:50,000. Within this are three feature classes: 1999 improved land use, 2012 updated land use and 1999–2012 land use change layer. The feature classes are polygon datasets with attributes describing land use. Land use is classified according to the Australian Land Use and Management Classification (ALUMC) Version 7, May 2010. Note that a representation showing land use at secondary level is available when working within a geodatabase.

Digital Data is supplied with a licence and by using the data you confirm that you have read the licence conditions included with the data and that you agree to be bound by its terms.

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### Request a land use map

Available from the [QLUMP](#) website, it is possible to [request a land use map](#) based upon a specific location (Lot on Plan, Street address or Central latitude/longitude coordinates) in Queensland. The land use maps are emailed upon request in portable document format (PDF). The maps present the most recent land use information available at the secondary level of the Australian Land Use and Management (ALUM) Classification.

### View land use on the Queensland Globe

The most recent land use information available state-wide in Queensland is available for viewing on the [Queensland Globe](#). This application allows browsing of Queensland spatial data including land use, maps and up-to-date satellite imagery.

Land use is available for viewing within the Planning and Cadastre category globe.



## Appendix A Accuracy assessment

The accuracy assessment provided reference data suitable for assessing the updated land use map. For each of the sample points, the true land use class was independently determined (this provided the reference data) based on desktop interpretation of the same imagery and ancillary datasets available to the mapper. These points were then compared to the mapped class (map data) and the information summarised in the error matrix. The accuracy is summarised in terms of total accuracy, Kappa and user's and producer's accuracies. Each accuracy parameter is reported using a point estimate and a 95% posterior interval. Accuracy figures are provided as probabilities between 0 and 1.

Total accuracy provides an estimate of the overall accuracy of the map, and can be expressed as the probability that a point is mapped correctly. However, it should be kept in mind that total accuracy can be misleading, particularly when a dominant class exists. The Kappa statistic attempts to overcome this problem by adjusting for chance agreement. A common rule of thumb suggests a value of Kappa between 0.6 and 0.8 represents moderate agreement between the map and the ground truth, a value greater than 0.8 suggests strong agreement. Values less than 0.2 suggest the map is only marginally improved compared to a map produced by random allocation.

Points that differ between the map and the reference data may be due to positional or spatial errors. Inaccurate registration of datasets is an example of spatial error. Thematic errors are the incorrect labelling of an area due to difficulties in determining the true land use in that area, or by oversight or other operational errors. Spatial errors influence thematic accuracy. The purpose here is to assess the thematic accuracy of land use data. However, as described above, the separation of spatial and thematic errors can be difficult and was not undertaken. As a result, the accuracy assessment reflects properties of the land use data as a whole.

Note that the revised 1999 land use and the land use change datasets were not accuracy assessed.

### Updated land use dataset

The updated land use dataset was accuracy assessed for each catchment within the SEQ NRM region, based on a random sampling strategy, using the map classes (area and frequency) as the strata. The stratified estimate of total accuracy and the Kappa parameters are presented for each catchment in Table 5 below. As the lower bound of the confidence interval for total accuracy is greater than 0.8, the mapping meets ACLUMP specification.

A more detailed assessment and discussion of each catchment, including the user's and producer's accuracies for each land use class may be viewed in the individual catchment reports.

**Table 5: Summary of accuracy parameters by catchment for updated land use in the SEQ NRM region**

Catchment	Total accuracy	95 % interval		Kappa	95% interval	
Maroochy and Noosa	0.89	0.84	0.92	0.88	0.81	0.91
Stanley River	0.92	0.83	0.96	0.88	0.76	0.94
Pine	0.87	0.81	0.91	0.84	0.77	0.89
Brisbane River	0.94	0.89	0.97	0.91	0.83	0.95
Lockyer Creek	0.89	0.80	0.94	0.82	0.69	0.90
Bremer River	0.95	0.88	0.98	0.92	0.80	0.96
Logan-Albert	0.91	0.84	0.94	0.86	0.76	0.91
Moreton Bay Islands	0.92	0.81	0.96	0.86	0.70	0.93
South Coast	0.90	0.84	0.94	0.88	0.81	0.93