

Land cover change in Queensland 2011–12

Statewide Landcover and Trees Study Report

Prepared by: Remote Sensing Centre, Science Delivery, Department of Science, Information Technology, Innovation and the Arts

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List of acronyms

AVHRR	Advanced Very High Resolution Radiometer
BA	Basal area (in m ² /ha)
AGO	Australian Greenhouse Office
BRDF	Bi-directional Reflectance Distribution Function
DEM	Digital Elevation Model
DERM	Department of Environment and Resource Management
DE	Department of the Environment
DNR	Department of Natural Resources
DNRM	Department of Natural Resources and Mines
DNRW	Department of Natural Resources and Water
DPIF	Department of Primary Industries and Fisheries
DSITIA	Department of Science, Information Technology, Innovation and the Arts
EPA	Environmental Protection Agency
ETM+	Enhanced Thematic Mapper Plus
FPC	Foliage Projective Cover
GA	Geoscience Australia
GCP	Ground Control Point
GIS	Geographic Information System
GPS	Global Positioning Systems
HVR	High-value regrowth
LGA	Local Government Area
MGA	Map Grid of Australia
Mt	Megatonnes
NCAS	National Carbon Accounting System
NFI	National Forest Inventory
NHT	Natural Heritage Trust
NRMR	Natural Resource Management Region
NRW	Department of Natural Resources and Water
RE	Regional Ecosystem
RMSE	Root Mean Square Error

QLUMP	Queensland Land Use Mapping Program
QMDC	Queensland Murray-Darling Committee
SEQ	South East Queensland
SLATS	Statewide Landcover and Trees Study
SRTM	Shuttle Radar Topographic Mission
TM	Thematic Mapper
TRAPS	Transect Recording and Processing System
UNFCCC	United Nations Framework Convention on Climate Change
USGS	United States Geological Survey
VMA	<i>Vegetation Management Act 1999</i>
VMOLA	<i>Vegetation Management and Other Legislation Amendment Act 2004</i>

Section 1 Summary of results

Statewide clearing

- The statewide average annual woody vegetation clearing rate for 2011–12 was 153 640 hectares per year (ha/year). This is 68% higher than the 2010–11 clearing rate of 91 690 ha/year, and the highest clearing rate since 2006–07 (Figure 1, page 1 below).
- Clearing of remnant woody vegetation for 2011–12 was 34 590 ha/year or 23% of total clearing. This is a lower percentage of remnant clearing than the 28% in 2010–11, although more remnant vegetation was cleared (Figure 1, this page and Table 7, page 35).
- The regulation of high-value regrowth (HVR) was in place for the entire 2011–12 era. Of the 119 050 ha/year of non-remnant woody vegetation clearing in 2011–12, 18 720 ha/year or 12% of total clearing was vegetation mapped as HVR (Figure 1, this page and Table 7, page 35).
- Of the 153 640 ha/year cleared in 2011–12, 57 650 ha/year (38%) had previously been detected as woody vegetation clearing in earlier land cover change eras. The percentage of repeat clearing incidences has increased considerably this era (Table 9, page 41).

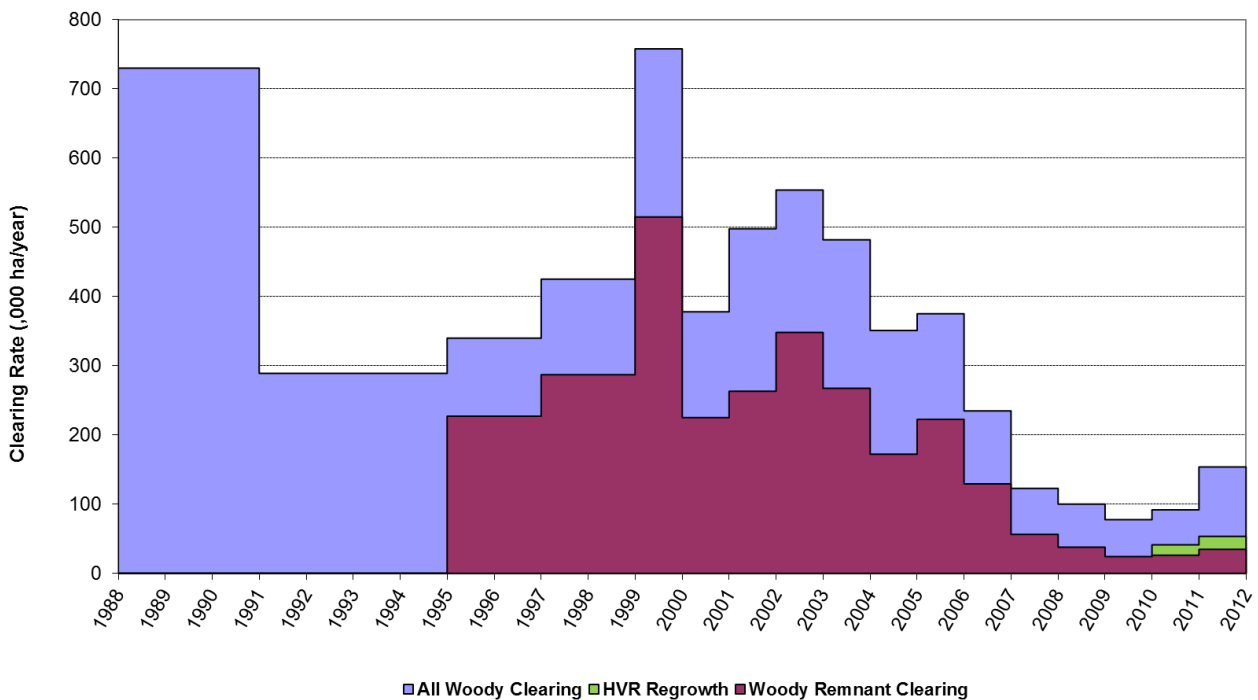


Figure 1: Annual woody vegetation clearing rate in Queensland (1988–2012)¹

¹ Regional Ecosystem remnant mapping is available from 1995 onwards

Clearing analysis

- The split of total clearing across tenures for 2011–12 was freehold (63%), leasehold (32%), other tenures (1%) and other reserves (4%) (Table 5, page 30).
- Clearing for pasture remained the single major replacement cover, making up 88% of total clearing for 2011–12, whilst clearing for forestry areas followed with approximately 5%, and 4% was cleared for mining purposes (Table 5, page 30).
- Medium trees (10–30m in height) accounted for 63% of total clearing detected in 2011–12 (Table 8, page 38).
- The Brigalow Belt biogeographic region, with 87 700 ha/year (57% of total clearing) for 2011–12, continued to contribute the highest woody vegetation clearing rate. This is nearly double the 45 000 ha/year clearing rate reported for the 2010–11 era (Table 10, page 46).
- The second highest clearing rate occurred in the Mulga Lands biogeographic region (29 360 ha/year), representing an increase of 49% from the previous era (Table 10, page 46).
- Within the Brigalow Belt biogeographic region, 18% of the total woody vegetation clearing was defined as remnant, whilst in the Mulga Lands the figure was 24% (Table 11, page 47).
- The clearing rate for drainage divisions was highest for North East Coast (78 060 ha/year), followed by Murray-Darling (60 890 ha/year). Combined, these two drainage divisions accounted for 89% of the state’s clearing (Table 12, page 48).
- The Reef catchments recorded a clearing rate of 73 720 ha/year. This is a 113% increase over the 34 550 ha/year reported in the 2010–11 (Table 12, page 48). Clearing in Reef catchments (3 330 ha/year) accounted for 57% of the state’s clearing for mining. The Reef catchments are a subset of the North East Coast drainage division, indicated by the blue outline in Figure 26 (page 50).
- The local government area of Isaac Regional Shire recorded the highest clearing rate of 20 550 ha/year in 2011–12, which is more than three times the amount identified in 2010–11 (Table 21, page 96).
- The Natural Resource Management region (NRMR) with the highest clearing rate was Fitzroy Basin with 41 610 ha/year, representing a 171% increase from 2010–11 (Tables 13 and 14, page 56).

Section 2 Background

The Statewide Landcover and Trees Study (SLATS) is a major vegetation monitoring initiative of the Queensland Department of Science, Information Technology, Innovation and the Arts (DSITIA). SLATS gathers accurate information on changes in wooded vegetation cover for vegetation management planning and compliance.

SLATS produces annual reports on land cover change. The following supplementary reports have also been produced:

- *1999–2000 clearing in the Murray-Darling (DNR&M, 2003b), Fitzroy (DNR&M, 2002), Burdekin (DNR&M, 2003c) catchments, and the Burnett/Mary National Action Plan (NAP) Region (DNR&M, 2003d) and the Western South-East National Action Plan (NAP) Region (DNR&M, 2003e).*
- *Clearing in each of the Natural Heritage Trust Natural Resource Management Regions for 2001–03, 2003–04, 2004–05, 2005–06, 2006–07, 2007–08, 2008–09, 2009–10 and 2010–11.*
- *Analysis of vegetation clearing rates in Queensland (Supplementary report to land cover change in Queensland 2007–08, 2008–09, and 2009–10).*

Scope

SLATS maps the extent of all woody vegetation across the state. SLATS only reports on woody vegetation change, rather than change for all vegetation. Refer to section 3.3 (page 9) for a definition of woody vegetation. To complement this assessment, the Queensland Herbarium reports on all woody and non-woody changes to remnant status as part of its Regional Ecosystem mapping program (Accad *et al.*, 2013 <http://www.ehp.qld.gov.au/ecosystems/remnant-vegetation/index.html>).

SLATS has previously completed detailed baseline land cover mapping for the entire state, using 1991 imagery to discriminate areas of woody vegetation from pasture, crop, water, settlement and other land cover types. This was the first medium resolution map of wooded vegetation cover for the entire state of Queensland. More recent land use mapping is now provided by the Queensland Land Use Mapping Program (QLUMP) <http://www.qld.gov.au/environment/land/vegetation/mapping/qlump/>.

Legislative framework

SLATS monitors Queensland's forests and woodlands to assess vegetation extent and clearing activities, in support of the *Vegetation Management Act 1999* (VMA) and regional planning initiatives. The VMA was introduced in 2000 to regulate the clearing of native vegetation in order to conserve remnant vegetation, prevent land degradation and loss of biodiversity, maintain ecological processes, and reduce greenhouse gas emissions. The Queensland Government monitors compliance with the vegetation management framework through analysis of SLATS data and other information.

This report reflects the vegetation management framework in place during the 2011–12 reporting period. In December 2013, the legislative framework was amended. These changes include how and when the legislation is applied, new vegetation mapping and altered definitions. This report does not capture nor reflect these changes.

SLATS Reference Group

The SLATS Reference Group (formerly SLATS Advisory Committee) was established to provide feedback on Queensland Government remote sensing research from a wide range of stakeholders and to assist with communicating results to industry, conservation groups and the wider community. The group has representatives from:

- Department of Science, Information Technology, Innovation and the Arts (DSITIA)
- Department of Natural Resources and Mines (DNRM)
- Meat and Livestock Australia
- Queensland Regional Natural Resource Management Groups Collective
- Queensland Farmers Federation
- Brisbane Region Environment Council
- Wildlife Preservation Society of Queensland
- AgForce
- University of Queensland

Section 3 Methods

The following section provides an overview of the methods used in this study. The SLATS website <http://www.qld.gov.au/environment/land/vegetation/mapping/slats/> has scientific papers that describe various aspects of the methods in greater detail.

3.1 SLATS analysis periods and spatial resolution

Spatial resolution

SLATS mapping provides a consistent dataset covering the entire state at medium spatial resolution. The mapping is based on analysis of Landsat Thematic Mapper (TM) and Enhanced Thematic Mapper Plus (ETM+) satellite imagery. Landsat imagery has a spatial resolution of 30m, so is typically used to produce maps at a scale of 1:100 000 or coarser. Since SLATS commenced Landsat analysis, the imagery has historically been resampled to 25m spatial resolution. This resampling was the convention used by Geoscience Australia (GA), who was the major supplier of imagery until 2008. From 2008 onwards, SLATS has used Landsat data provided by the United States Geological Survey (USGS) at no cost. However, for consistency SLATS has maintained the 25m resampling in the 2011–12 analysis period.

Landsat imagery can be used to reliably map areas of woody vegetation change of one hectare or greater. However, the image resolution may limit its suitability for mapping narrow vegetation corridors. SLATS mapping is not intended to be a substitute for high resolution studies of areas such as riparian vegetation or small patches of remnant bushland. These areas would conventionally be studied by using high resolution satellite imagery or aerial photography.

Statistics for 2003–12 in this report have been produced using 25m resolution data sets. Statistics from 1988–2003 in this report are based on the generalised 100 m resolution (previously 1000m for 1991–1999) as provided in previous reports (Table 1, page 6).

Table 1: Imagery source and data resolution of SLATS reports

Reporting period	Satellite and sensor source	Resolution (pixel size)	
		Imagery used	Statistics calculations
1988–91 (DNR&M, 2004)	Landsat 5 TM	30 m (resampled to 25 m)	100 m
1991–95 (DNR, 1999b)	”	”	1000 m
1995–97 (DNR, 1999c)	”	”	”
1997–99 (DNR, 2000)	Landsat 5 TM and Landsat 7 ETM+	”	”
1999–2001 (DNR&M, 2003a)	Landsat 7 ETM+	”	100 m
2001–03 (DNR&M, 2005)	Landsat 7 ETM+ and Landsat 5 TM	”	”
2003–04 (NRM, 2006)	Landsat 5 TM	”	25 m
2004–05 (NRW, 2007)	Landsat 5 TM	”	25 m
2005–06 (NRW, 2008b)	Landsat 5 TM	”	25 m
2006–07 (NRW, 2008a)	Landsat 5 TM	”	25 m
2007–08 (DERM, 2009)	Landsat 5 TM	”	25 m
2008–09 (DERM, 2010)	Landsat 5 TM	”	25 m
2009–10 (DSITIA, 2012)	Landsat 5 TM	”	25 m
2010–11 (DSITIA, 2014)	Landsat 5 TM	”	25 m
2011–12 (DSITIA, 2014)	Landsat 5 TM and Landsat 7 ETM+	”	25 m

Study period

SLATS acquires a range of satellite overpass dates in order to capture suitable cloud-free Landsat satellite images for the entire state each year. The images are typically obtained in the dry winter months between June and October. However, wet weather in 2011 meant images were acquired from a longer than usual period, from February–November 2011 to May–November 2012.

Due to the range of overpass dates, a SLATS analysis period is not a discrete 365-day period. SLATS thus reports on woody vegetation clearing rates rather than actual areas of clearing. Comparing areas of actual clearing is misleading, because variations in the satellite overpass dates means reporting periods may be significantly longer or shorter than a year.

Since 1999, SLATS has acquired and analysed imagery to derive yearly statistics. From 1988 to 1999, imagery was not acquired yearly, so SLATS reporting varied from two to four years (Table 1, page 6). However, the statistics have been calculated as annual clearing rates to provide consistency for comparison (Figure 1, page 1).

A total of 88 satellite scenes or footprints are incorporated in each SLATS analysis period (Figure 2, this page). Theoretically, in any one year, acquisition dates can differ for each of the 88 satellite scenes. However, every attempt is made to acquire consecutive sequences of images with the same overpass date (Figure 3, below). This assists in processing spatial and radiometric corrections for the data.

The “Satellite image footprints and dates for SLATS analysis” spatial dataset depicted in Figure 2 (below) is available for download online from QGIS (<http://dds.information.qld.gov.au/DDS/>). This layer contains all Landsat scene dates used in the SLATS analysis from 1988–2012.

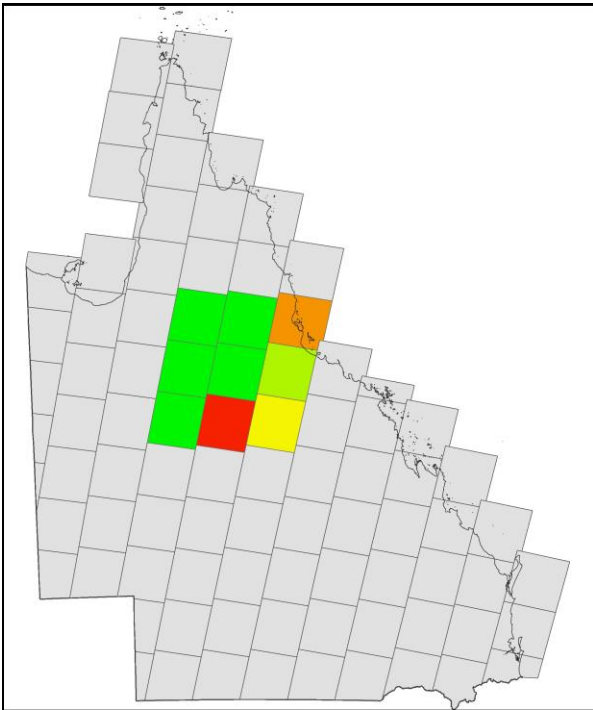


Figure 2: Landsat scene footprints

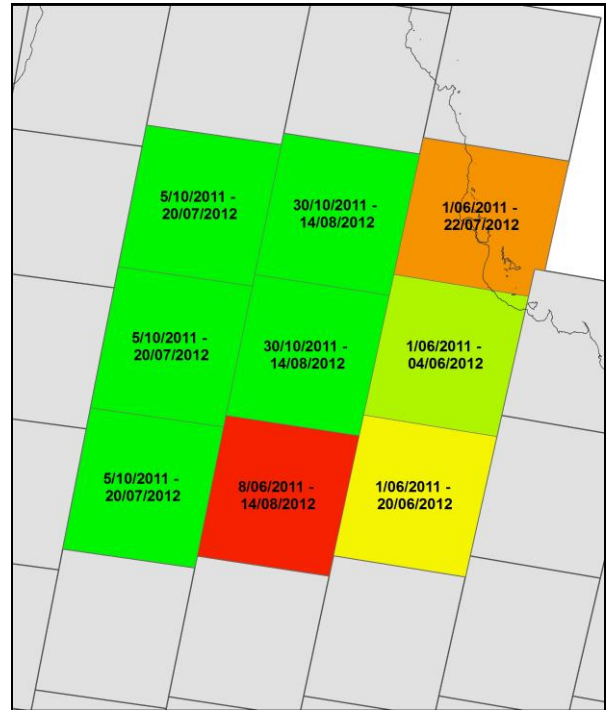


Figure 3: An example of SLATS 2011–12 scene dates

3.2 Calculation of clearing rates

SLATS calculates an annual clearing rate measured in thousands of ha/year. The following examples show how clearing rates are calculated for a scene with analysis periods less than or greater than a year.

Example 1: Analysis period is less than 365 days

SLATS annual woody vegetation clearing rate calculation example:

$$\begin{aligned}
 \text{Area of clearing (ha)} &= \text{number of pixels} \times 625 \text{ m}^2/10\,000 \text{ m}^2/\text{ha} \\
 &= 1704 \text{ pixels} \times 625 \text{ m}^2/10\,000 \text{ m}^2/\text{ha} \\
 &= 106.5 \text{ ha} \\
 \\
 \text{Analysis period (days)} &= \text{'After date'} - \text{'Before date'} \\
 &= 20/07/2012 - 05/10/2011 \\
 &= 289 \text{ days} \\
 \\
 \text{Rate per annum (ha/year)} &= \text{Area (ha)} \times 365.25(\text{days/year})/\text{Analysis period (days)} \\
 &= 106.5\text{ha} \times 365.25(\text{days/year})/289 \text{ days} \\
 &= 134.6 \text{ ha/year}
 \end{aligned}$$

The annual woody vegetation clearing rate within a reporting area is then aggregated in the SLATS report. In this example, SLATS would report an annual woody vegetation clearing rate of 134.6 ha/year for the 2011–12 analysis period.

Example 2: Analysis period is greater than 365 days

SLATS annual woody vegetation clearing rate calculation example:

$$\begin{aligned}
 \text{Area of clearing (ha)} &= \text{number of pixels} \times 625 \text{ m}^2/10\,000 \text{ m}^2/\text{ha} \\
 &= 2459 \times 625 \text{ m}^2/10\,000 \text{ m}^2/\text{ha} \\
 &= 153.7 \text{ ha} \\
 \\
 \text{Analysis period (days)} &= \text{'After date'} - \text{'Before date'} \\
 &= 22/07/2012 - 01/06/2011 \\
 &= 417 \text{ days} \\
 \\
 \text{Rate per annum (ha/year)} &= \text{Area (ha)} \times 365.25(\text{days/year})/\text{Analysis period (days)} \\
 &= 153.9 \text{ ha} \times 365.25(\text{days/year})/417 \text{ days} \\
 &= 134.6 \text{ ha/year}
 \end{aligned}$$

In this example, SLATS would report an annual woody vegetation clearing rate of 134.6 ha/year for the 2011–12 analysis period. Due to the different analysis period, this clearing rate is the same as example 1, despite the total area being different.

3.3 Definition of wooded vegetation and woody vegetation

Wooded vegetation

SLATS maps vegetation extent for all perennial wooded vegetation that can be distinguished using Landsat TM/ETM+ imagery. Wooded vegetation is mapped regardless of tree height or density. Wooded vegetation includes stands of native vegetation, disturbed areas of native vegetation, woody regrowth following clearing, plantations of native and exotic species, some woody weeds and urban woody vegetation.

The wooded vegetation extent for 2011 is compiled from the Foliage Projective Cover (FPC) index values, ranging from 1–100%. Only non-wooded pixels (0% FPC) are excluded from the wooded extent area. The method for calculating FPC is explained further in section 3.5 (page 10).

Woody vegetation

SLATS defines woody vegetation as the subset of wooded vegetation that has an FPC of over 10%. SLATS research suggests that 20% crown cover, where the vertically projected tree crown area is greater than 20% of the ground area equates to 11% FPC on average (Scarth *et al.*, 2008a). This aligns with the nationally agreed definition for forests and woodlands (Montreal Process Implementation Group for Australia and National Forest Inventory Steering Committee, 2013).

Forest

Under the Kyoto Protocol, ratified by the Australian Government in 2008, the accounting rules have strict definitions for forest and for the areas to be counted as ‘deforestation’ (direct human-induced conversion of forests to other non-forest land use). The definition of forest used in the National Carbon Accounting System (NCAS) is based on a minimum crown cover of 20%, a height of two metres and other constraints according to the Kyoto Protocol (AGO, 2003). The NCAS reports on the subset of the total SLATS reported area that meets the definitional and reporting rules for national greenhouse inventory reporting (AGO, 2006; Macintosh, 2007). The NCAS framework also uses complex modelling to estimate greenhouse gas emissions and sinks for the areas included as ‘Kyoto lands’.

3.4 Imagery selection and pre-processing for 2011–12

Imagery acquisition

For 2011 imagery, SLATS downloaded geometrically corrected Landsat 5 TM satellite imagery at no cost from the United States Geological Survey (USGS) website (www.glovis.usgs.gov). Landsat 5 TM imagery was the best available Landsat imagery for SLATS purposes since the partial failure of the ETM+ instrument on Landsat 7 (USGS, 2003).

Following the failure of Landsat 5 in late 2011, Landsat 7 was the only Landsat satellite to acquire imagery during 2012.

However, Landsat 7 has been capturing imagery in ‘SLC-off’ mode since 2003 when its scan line corrector failed resulting in strips of lost data along the eastern and western scene margins. While radiometric and geometric quality of the captured images is maintained, approximately 22% of each image is lost due to the SLC-off gaps, with only a 22km wide strip in the centre of the image being completely unaffected.

In order to ensure a complete 2012 image coverage for the 2011–12 change detection, a

composite 2012 image was created. A primary 2012 Landsat 7 image was selected, and missing pixels filled from other 2012 Landsat 7 images, to create a complete 2012 image for each scene. Infill dates used were chosen as close as possible to the primary date, but mostly within a month or two. As always, preference was given to cloud free, dry season images in the selection process where possible. The development of the compositing method also enabled the infill of pixels obscured by cloud and shadow, which would otherwise be masked.

The source image date for each pixel in the composite was recorded in a separate raster image, thus enabling the calculation of the era length and clearing rates on a per-pixel basis.

The downloaded imagery aligns well with the 2002 Landsat 7 ETM+ baseline previously used to rectify imagery purchased from GA. Where the spatial alignment was not sufficiently close, SLATS manually re-rectified the USGS-sourced imagery to match the existing SLATS baseline.

Radiometric standardisation

SLATS applied radiometric standardisation to the Landsat 2011–12 images. Radiometric standardisation allows scene-to-scene matching over space and time. This improves mosaicing and classification, and enables the use of statewide field data for time-series analysis. In turn, this improves the accuracy of the data and the certainty of change in rates of clearing. Radiometric standardisation included the removal of the on-board radiometric calibration and replacement with a vicarious calibration that removes time-based radiometric trends caused by sensor instability (de Vries *et al.*, 2007). Additionally, SLATS applied an empirical radiometric correction to correct for variation in solar incidence angle, solar azimuth, earth-sun distance, viewing angle, systematic atmospheric effects, and the effect of bi-directional reflectance distribution function (BRDF) of the surface measured (Danaher, 2002).

Further research has been conducted in this area, and it is planned that in the future, the SLATS processing chain will be able to make use of the standardised surface reflectance, as described in Flood *et al* (2013). This is expected to improve the image standardisation, and hence improve the ability to detect clearing.

Topographic corrections

SLATS also applied a simple topographic correction to the reflectance imagery to remove artefacts due to variation in illumination angle on sloping terrain (Dymond and Shepherd, 1999). This correction has the effect of ‘flattening’ the terrain, by estimating the reflectance as if the surface had been horizontal. This correction reduces the effect of hill slope to provide more uniform estimates of FPC. Classification based on this corrected imagery is therefore more accurate in areas of high slope. This increased accuracy reduces the amount of manual editing required to correct initial misclassifications.

Other corrections

Cloud, smoke and shadow contamination in the imagery was masked out, to avoid impacts on models for wooded extent, FPC index and woody vegetation change (Kitchen & Gillingham, 2006).

3.5 Estimating wooded vegetation extent and FPC

This report calculates wooded vegetation extent for 2011 using the methods outlined in Danaher *et al.* (2010). This information is included in the tabular statistics associated with woody vegetation clearing by region. SLATS developed a new method in 2010, leading to version 2.3 (V2.3) of the wooded vegetation extent and FPC index time series. In this report, estimates of wooded vegetation extent and FPC were provided based on an annual time-series of Landsat TM and

ETM+ imagery. Early SLATS reports calculated the wooded vegetation extent in Queensland based on the SLATS 1991 baseline land cover mapping, adjusted for subsequent clearing and regrowth. As regrowth is difficult to measure properly, this measure of wooded extent has become less accurate over time.

The wooded extent and FPC product, version 2.3

An FPC index was generated for each image date with separate indices developed for Landsat TM and ETM+ image sequences (Lucas *et al.*, 2006; Armston *et al.*, 2009). Compared to traditional vegetation indices, the FPC indices have reduced sensitivity to background reflectance variability caused by fire scars and soil colour. However, FPC indices are highly sensitive to spatial and temporal changes in green herbaceous ground cover. These FPC indices have been incorporated into the woody vegetation change detection procedure, and are the primary input data in the wooded vegetation extent and FPC index time series products.

The FPC index is an empirical model, based on an extensive field dataset of greater than 2000 observations. In order to predict FPC values across the state, the model relates the field observations to other data, consisting of a gridded climate variable, vapour pressure deficit (VPD), and data from transformed Landsat bands 2–7 and cross-products of these bands. The Landsat band cross-products are used to account for interactions between the Landsat bands and FPC, i.e. the relationship between one Landsat band and FPC depends on the value of a different Landsat band.

Model predictions of FPC have been compared to estimates of woody FPC from independent field and airborne lidar data captured at 47 sites across a range of regional ecosystems in Queensland between 2004 and 2005 (Armston *et al.*, 2009). Lidar measurements were calibrated to estimates of wooded FPC using direct field measurements (Root Mean Square Error (RMSE) 5.34%). The lidar estimates of FPC showed a strong correspondence with the Landsat FPC index estimates from images captured under dry season conditions (r^2 0.80; RMSE 8.95%) in Armston *et al.* (2009).

The wooded vegetation extent and FPC index time series product V2.3 was developed from an automated decision tree classification based on a time series of Landsat FPC index images (Kitchen *et al.*, 2010; Danaher *et al.*, 2010). All SLATS dry-season (May–October inclusive) image dates from 1986–2010 were used in the classification. A decision tree based on simple temporal indices was optimised with a genetic algorithm (a global optimisation technique) using a training dataset of wooded vegetation presence/absence derived from fieldwork and aerial photography. The wooded extent classification model had a Kappa statistic (a measure of the proportion of agreement obtained after removing that which could be expected to occur by chance) of 85%.

SLATS applies a number of corrections to the data:

- The water masking algorithm sometimes falsely detects water in shadowed areas of steep terrain. These commission errors have been removed utilising topographic shadow and incident angle image products.
- Areas with topographic slope greater than 25% and classified as non-woody due to low solar incidence angles were corrected with a time series predicted FPC value.
- In forestry plantations and areas initially classified as non-wooded and not cropping, a simple *t*-test algorithm was used to determine the most recent change-point in the annual time-series (e.g. due to fire or tree clearing). This algorithm significantly improved the wooded extent classification in areas that were regenerating following clearing or burning, however omission of early stage woody regrowth from the wooded extent classification is a

known limitation in some areas, leading to an overestimation of non-wooded (0% FPC) areas.

- Cropping areas were classified as non-wooded using crop masks sourced from the Queensland Land Use Mapping Project (QLUMP).
- Any pixels of persistent cloud that prevented pixels being classified successfully by the algorithms were filled in by the most recent non-contaminated pixels.

In order to overcome limitations of the wooded extent and FPC V2.3 product, SLATS scientists are currently assessing estimates of persistent green vegetation cover derived from the entire USGS Landsat-5 TM and Landsat-7 ETM+ archive. The 'persistent green' product could possibly be used for detecting long-term changes in woody vegetation, such as regrowth following clearing, encroachment of woody weeds, dieback, thickening and thinning.

3.6 Detecting change in woody vegetation

Automatic analysis

The SLATS method detects change in woody vegetation through automatic analysis to provide a 'probability of woody vegetation change' raster, which is then classified by an experienced analyst. This method was first developed for the 2003–04 period (DNR&M, 2006; Scarth *et al.*, 2008b). It uses data from the entire SLATS Landsat TM/ETM+ archive from 1987/88 to 2012, including spectral data, and the time series of wooded extent and FPC index values from 1988–2011. This method accounts for variation across wet and dry season imagery to enable consistent mapping of woody vegetation. Verified change from previous periods is used to train the model to detect change. This change detection method significantly improves efficiency when compared to earlier methods used by SLATS. Due to residual scene mis-registration (Armston *et al.*, 2002; Gill *et al.*, 2010a), a filter was applied to remove clumps of one or two pixels (0.125 ha or less) to reduce the 'speckle' effect in the classification.

The minimum level of vegetation that can be mapped as change depends on the conditions at the time of the 2011 and 2012 satellite imagery data capture. Imagery captured during the dry season typically has greatest contrast between woody vegetation and grass. Wet season imagery with green pasture has less contrast, as green grass is spectrally similar to woody areas. This makes separation of woody from non-woody cover more difficult in open woodland during the wet season. It may not be possible to detect change in vegetation with FPC less than 11% using automated processing. However, it may be possible to map it with additional visual interpretation and field work.

Image interpretation and independent checks

Image interpretation has been improved with the increasing availability of higher resolution satellite and aerial imagery which is available through Google Maps, Queensland Globe and other image services. Additionally, image interpretation has also been aided by DSITIA's archive of SPOT 4 and 5 imagery (2005–06 and 2009) and 2009 and 2012 2.5m pan sharpened SPOTmaps coverage of large parts of Queensland.

Extensive work has been undertaken to ensure the integrity of the change analysis. Procedures to analyse the data have been comprehensively documented and are available to SLATS scientists on the project's intranet to ensure consistency between operators. Many of the procedures have been scripted to avoid errors occurring. Log files are recorded, allowing errors to be traced. The SLATS change detection method offers the advantages of both automated and visual methods, with an independent check by an experienced operator to ensure a high level of accuracy and

consistency. All analytical methods have been subjected to independent peer review and published in relevant scientific literature and international conference proceedings.

Limitations

The main limitation of the current method lies not in misclassification of change, but in determining the extent (area) of change at a clearing location, particularly in areas of sparse (low FPC) wooded cover. The wooded vegetation extent is very important for determining the area of vegetation change, as it delineates how much woody vegetation existed before clearing. Considerable effort has gone into ensuring that the wooded extent and FPC index V2.3 is well-calibrated to ground vegetation measurements.

3.7 Woody vegetation clearing by biomass

Estimates of total biomass and carbon were modelled using the pre-clearing wooded vegetation extent and FPC product (V2.3) for 2011. Wooded percentage FPC estimates were converted to live stand basal area (m²/ha) by:

$$SBA = \frac{-38.6 \ln(1 - FPC/100)}{1 - 0.359 \ln(1 - FPC/100)}$$

This relationship is the inverse of Equation 2 in Armston *et al.* (2009), which was developed using a field dataset collected over a wide range of remnant vegetation communities in Queensland (RMSE = 7.26% FPC). It is important to note that this relationship does not account for differences in canopy structure and is not validated for woody regrowth following clearing. Due to the omission of early woody regrowth in the FPC V2.3, stand basal area of these areas are often not included in total biomass calculations.

These live stand basal area estimates were then converted to total biomass (above and below ground biomass) using equations developed by Henry *et al.* (2002) from a large number of eucalypt, acacia and rainforest sites in Australia including those from the Transect Recording and Processing System (TRAPS) program (Burrows *et al.*, 2002).

Above and below ground biomass were converted to the equivalent mass of CO₂, which is the conventional unit for greenhouse gas accounting. This is based on the established observation that 50% of tree biomass is carbon, which has been confirmed to within 2% for 19 eastern Australian tree species (Gifford, 2000). The corresponding CO₂ mass was then derived using a factor of 3.67, which simply adjusts for the mass of the attached oxygen atoms.

Some examples of basal area values of woody vegetation found throughout Queensland are displayed in Figure 4 (page 14).



A. Basal area of approximately 2 m²/ha



B. Basal area of approximately 4 m²/ha



C. Basal area of approximately 11 m²/ha



D. Basal area of approximately 17 m²/ha



E. Basal area of approximately 23 m²/ha



F. Basal area of approximately 29 m²/ha

Figure 4 (A–F): Examples of various basal areas (m²/ha) of woody vegetation

3.8 Regrowth

It is difficult to detect regrowth in relatively short timeframes, such as the annual SLATS reporting period. This is due to the relatively slow rate of woody vegetation growth and the low initial density of most regrowth stands. Therefore, an analysis of potential regrowth is not included in this report.

3.9 Fire

Areas affected directly by fire have not been mapped as woody vegetation change. While fires can remove a significant proportion of the foliage of woody vegetation, it is usually a temporary effect. In most cases, the foliage on mature trees recovers quickly. SLATS site data show that, on average, a fire removes less than 2 m²/ha basal area (John Carter, Remote Sensing Centre, DSITIA, pers. comm.). It is not common for fire to change land cover from woody to non-woody in a single event.

3.10 Natural tree death

Very little natural tree death was detected during 2011–12 (less than 0.01% of total woody vegetation change). The areas mapped as natural tree death were not included when calculating woody vegetation clearing rates in this report. Figure 5 (below) shows some examples of natural tree death.



Figure 5: Examples of natural tree death in the Desert Uplands

3.11 Missed clearing in previous era (2010–11)

Each year since 2004, SLATS has identified clearing missed in the previous era. Traditionally, missed clearing is not reported, as it is typically less than 2% of the total clearing rate in that era. During the 2011–12 analysis, the amount of missed previous era clearing for 2010–11 was approximately 5%. See Appendix F (page 99) for more detail.

3.12 Woody thinning

Under the VMA, thinning is defined as the selective clearing of vegetation at a locality to restore a regional ecosystem to the floristic composition and range of densities typical of the regional ecosystem surrounding that locality. It does not include clearing using a chain or cable linked between two tractors, bulldozers or other traction vehicles. For the purposes of this report, thinning is simply defined as the partial removal of woody vegetation. Thinning may be carried out for a range of purposes including property management to allow pasture to grow within woodlands, weed control, rural residential development, restoration of naturally sparse ecosystems, selective logging in plantations and native forests, and certain types of fodder harvesting. Examples of fodder harvesting and thinning are shown in Figures 6 and 7 (on page 16).

Thinning, as measured by SLATS, is defined as a decrease in FPC at the sub-pixel level. This is where a decrease in the FPC index has occurred, but the pixel is still classified as woody. Using the SLATS change detection method, thinning can be detected where part of the foliage cover is removed, particularly where there is also soil disturbance or changes in groundcover.

However, using Landsat imagery to map sub-pixel change has limitations. Although some of the thinned areas were verified in the field, thinned areas may not be as accurately mapped as other clearing categories. Hence, thinning has not been included as a separate class, but included in the total figure for clearing to pasture. For the 2011–12 era, 1 410 ha/year was identified as thinning (0.9% of total clearing).



Figure 6: Examples of harvesting for fodder in Mulga Lands



Figure 7: Examples of woody thinning (Mulga Lands, left and SEQ, right)

3.13 Replacement land cover

SLATS scientists assign each area of woody vegetation clearing to one of the replacement land cover classes in Table 2 (page 17). The assignment of these classes is primarily based on visual interpretation. In areas where there are many different forms of land use, it is sometimes difficult to interpret the final replacement class. For example, land cleared to pasture may later be converted to urban development. The accuracy for interpreting the replacement class is therefore lower than the accuracy for identification of woody vegetation change.

Table 2: Replacement land cover classes for woody vegetation change

Replacement land cover	Description
Pasture	Cleared for pasture includes: woody vegetation clearing for grazing, woody thinning, fodder clearing, rural residential, future urban land-use and privately owned plantations (i.e. not replanted as plantations).
Crops	Cleared for cropping or horticultural purposes.
Forest	Forestry clearing includes: all woody vegetation clearing within State forests, plantations and native forest, and cleared private plantations which are replanted.
Mining	Cleared for mining activities (including coal seam gas infrastructure).
Infrastructure	Cleared for roads, railways, water storage, etc.
Settlement	Cleared for imminent urban development. Clearing within the SEQ Regional Plan 'urban footprint' and other available regional planning 'urban footprints', was recoded to settlement (excluding infrastructure and mining).

3.14 Field verification

Field verification is an important part of the SLATS process, due to the difficulty of interpreting some types of change. Field inspection is often required in areas of black soil, fire, natural tree death and regrowth clearing, as well as trees killed by stem injection and thinning.

Between March and July 2013, SLATS officers undertook field verification of woody vegetation clearing on representative samples of 39 of the 88 scenes analysed. These 39 scenes accounted for more than 94% of the total detected woody vegetation clearing in the state. The primary purpose of the field checks was to verify the 2011–12 change analysis. At each site, analysts took a digital photograph and logged the following data:

- the accuracy of the classification
- the method of clearing used
- a visual estimate of the percentage of cleared timber removed or decayed
- the amount of coarse woody debris remaining after clearing
- the replacement land cover
- the maturity of timber cleared
- the presence of regrowth
- the original species
- the current species
- soil colour
- the presence of termites and fire.

As well as verifying new clearing, SLATS analysts revisited selected sites from previous years to gather data on timber decay rates, regrowth rates and regrowth clearing. An example of the change in coarse woody debris at a field revisit site is shown in Figure 8 (below). Figure 9 (page 19) shows the 80 new sites recorded and 168 revisited sites recorded during the field program undertaken in 2013. Each location may have been surveyed between one to six times in field studies since 1999 and will be periodically assessed in future field programs. At each site, a rating of coarse woody debris decline is recorded and a photo is taken. The rate of change of coarse woody debris is influenced by several factors including: the proposed land-use, type of vegetation cleared, rainfall, location and the economics of clearing.



Figure 8: Revisit site showing change in coarse woody debris between 2000 and 2004

Following field verification, SLATS analysts corrected the preliminary woody vegetation change classification. The analysts edited areas of uncertainty and misclassified change, and reclassified these areas to the field verified status. The edited classification was then thoroughly checked by an experienced image interpreter before finalising the analysis. This extensive field validation and checking ensures data consistency and quality across all scenes in the study. The change detection data are also utilised by the Queensland Herbarium for the development of Regional Ecosystem mapping (Queensland Herbarium 2012). Through this process, the Herbarium provides feedback to SLATS on accuracy and errors.

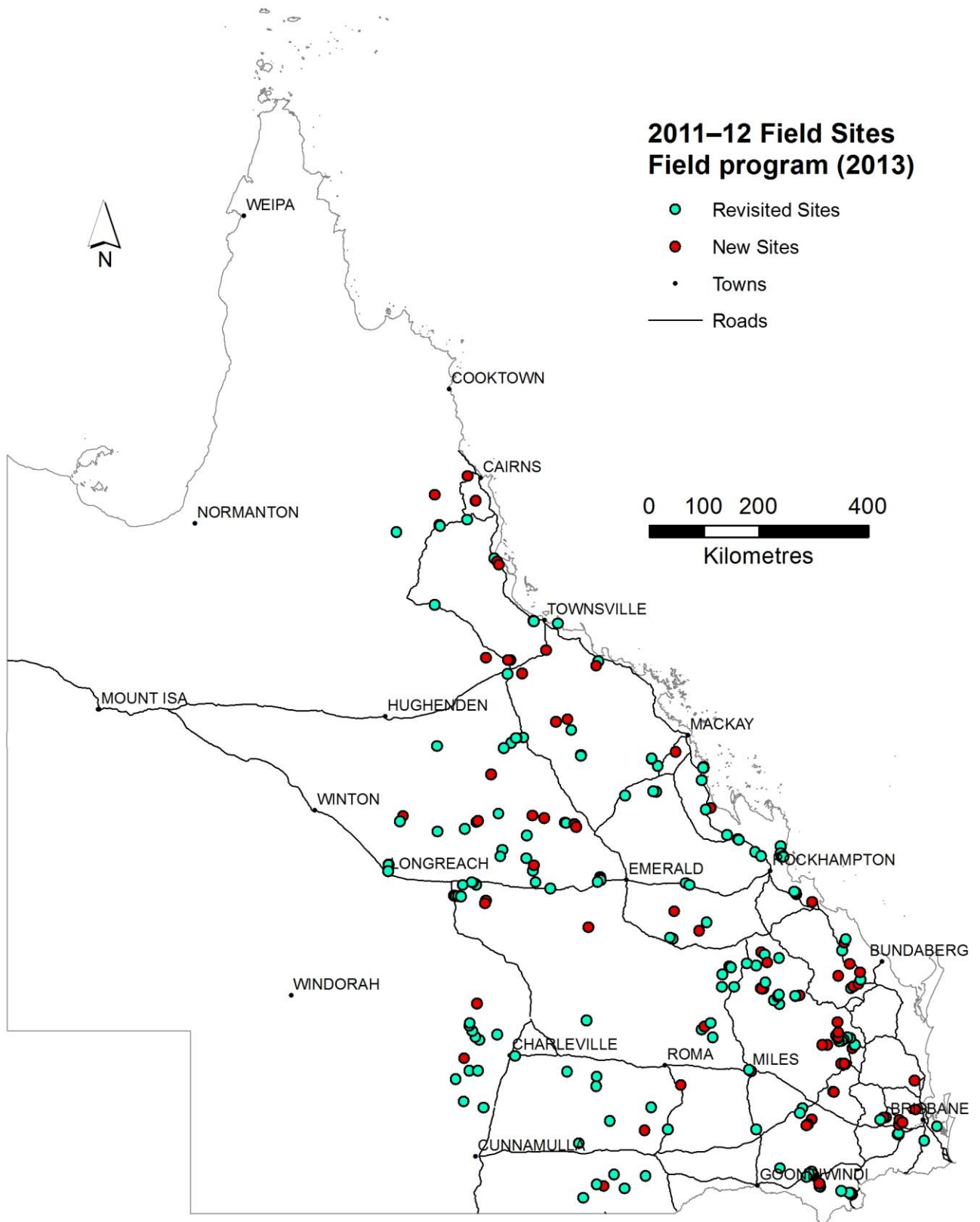


Figure 9: Location of sites revisited during the 2011–12 field program (undertaken in 2013)

3.15 Compilation of statewide data sets

SLATS created large, seamless mosaics of 2011–12 woody vegetation change, wooded extent, and the 2011 FPC index by joining the 88 scenes covering the state. Each scene was trimmed to a standard scene template to minimise overlap. When producing these mosaics, the scenes were overlapped in paths from south to north and paths were joined from west to east. In order to calculate annual woody vegetation clearing rates, a vector geographic information system (GIS) layer was created, with data on the extent and dates of each individual scene change raster in the mosaic.

The mosaic raster of cleared areas was intersected with GIS overlays, such as date, tenure type, 7'30" x 7'30" grid cell and catchments, to generate tabular statistics. For the 2011–12 analysis, revised GIS data sets were used as required, including updated tenure mapping, revised local government areas to reflect de-amalgamation from 1 January 2014, and Version 8.0. (Queensland Herbarium 2012) Regional Ecosystem mapping.

Woody vegetation clearing rate statistics for 2011–12 were calculated using full resolution data (25 m pixels), with GIS intersections using vector data rather than raster data to improve accuracy. It is important to note that the tabular statistics derived from the intersection of GIS layers generate slightly different clearing totals due to the different scales and accuracy of the various GIS overlays used.

All statistics are generated based on data transformed to an Albers equal-area projection, so woody vegetation clearing rates for different regions are comparable. All the vegetation change statistics in this report have been converted to annual rates to account for the variation in scene dates. The units of clearing rate used in the tables are thousands of ha/year (',000 ha/year) not km²/year as used in some of the earlier reports. One thousand ha/year is equal to 10 km²/year.

3.16 Accuracy assessment and limitations

The traditional form of accuracy assessment uses an independent data source of higher resolution, such as aerial photography. However, this is not always feasible at a statewide scale. The available aerial photography coverage does not usually align with the capture dates of the satellite imagery. Field validation is limited to a representative sample due to access, time and cost constraints. Therefore, statewide validation using aerial photography or field checking is not a viable option, and other alternatives need to be considered.

SPOT 5 accuracy assessment

Random point analysis using SPOT 5 imagery (10 m resolution) for the 2008–09 era found the amount of missed clearing was small (less than 0.05% of areas mapped as woody vegetation using the 2008 FPC Index), and that over 95% of the woody vegetation clearing mapped by SLATS was verified by the SPOT 5 analysis (Department of Environment and Resource Management [DERM] 2010).

3.17 Independent review of science quality

In 2004, an independent panel of academic, CSIRO and industry members reviewed the research and management of remote sensing science within the Queensland Government. The panel reviewed the quality of research, methods, relevance, and the quality and processes of remote sensing applications. SLATS change detection was a major focus of the review. The review panel praised the quality of SLATS science and suggested that SLATS research be published in refereed publications. This has now been done—for example, Lucas *et al.*, 2006; de Vries *et al.*, 2007;

Armston *et al.*, 2007; Armston *et al.*, 2009; Gill, 2009a; Gill *et al.*, 2010a; Gill *et al.*, 2010b; Flood *et al.*, 2013. Several more scientific papers are being prepared for publication.

Access to SLATS data including imagery is described on page 60. To ensure transparency, accountability and quality, SLATS methods are published at conferences and in peer-reviewed journals. A bibliography is on page 61.

3.18 Future SLATS reporting

The future availability of satellite imagery is one of the risks associated with continuity of the woody vegetation change analysis. Due to the failure of Landsat 5 in late 2011, Landsat 7 ETM+ was used as the source for 2012 winter imagery in order to complete the 2011–12 SLATS report. This will also be the case for the 2012–13 SLATS report. However, Landsat 8 is now operational, and will provide full winter coverage for 2013.

SLATS will also be moving from the Australian derived 25m Landsat scenes to the Landsat standard Worldwide Reference System 2 (WRS2) path/row footprint with 30m pixel resolution for the 2012–13 SLATS analysis and beyond.

Section 4 Statewide assessment of woody vegetation clearing

4.1 Wooded vegetation extent

The area of wooded vegetation extent in 2011, based on the V2.3 time series FPC index product, is shown in Table 3 (page 24). This table also shows the estimates of wooded vegetation extent for previous eras, based on previous versions of the FPC index product. For further details of these versions, see previous SLATS reports. The latest figures of wooded vegetation extent cannot be directly compared to estimates prior to 2004 because of methodology changes. For this reason, the woody vegetation clearing figures quoted in the SLATS reports should be used, rather than deriving clearing figures from the change in wooded vegetation extent across different time periods.

The changes between methods in wooded extent values for 2004–11 can be attributed mainly to a reduction in omissions, including:

- wooded areas on Cape York that were previously cloud affected and mapped as non-wooded or missing data
- wooded areas within fire scars
- wooded areas corresponding to plantation regrowth
- non-plantation wooded regrowth.

For 2004–11 products, it is often difficult to determine precise estimates of change in wooded vegetation extent for single Landsat scenes. This is due to the sensitivity of wooded vegetation extent estimates to different thresholds selected in the V2.3 method between years (Kitchen *et al.*, 2010).

The distribution of wooded vegetation extent in Queensland at 2011 is shown in Figure 10 (page 23). This map was created using the wooded extent and FPC index V2.3. Areas mapped as pasture in Figure 10 include both natural grasslands and areas cleared for pasture. There are significant areas of natural grassland in Queensland, such as the extensive Mitchell Grass Downs, which contain little woody vegetation.

Tabular data for percentages of wooded vegetation extent for Biogeographic regions, Biogeographic sub-regions, catchments, sub-catchments, local government areas and Natural Resource Management regions are contained further in the report and in Appendices C to E (pages 75 to 96).

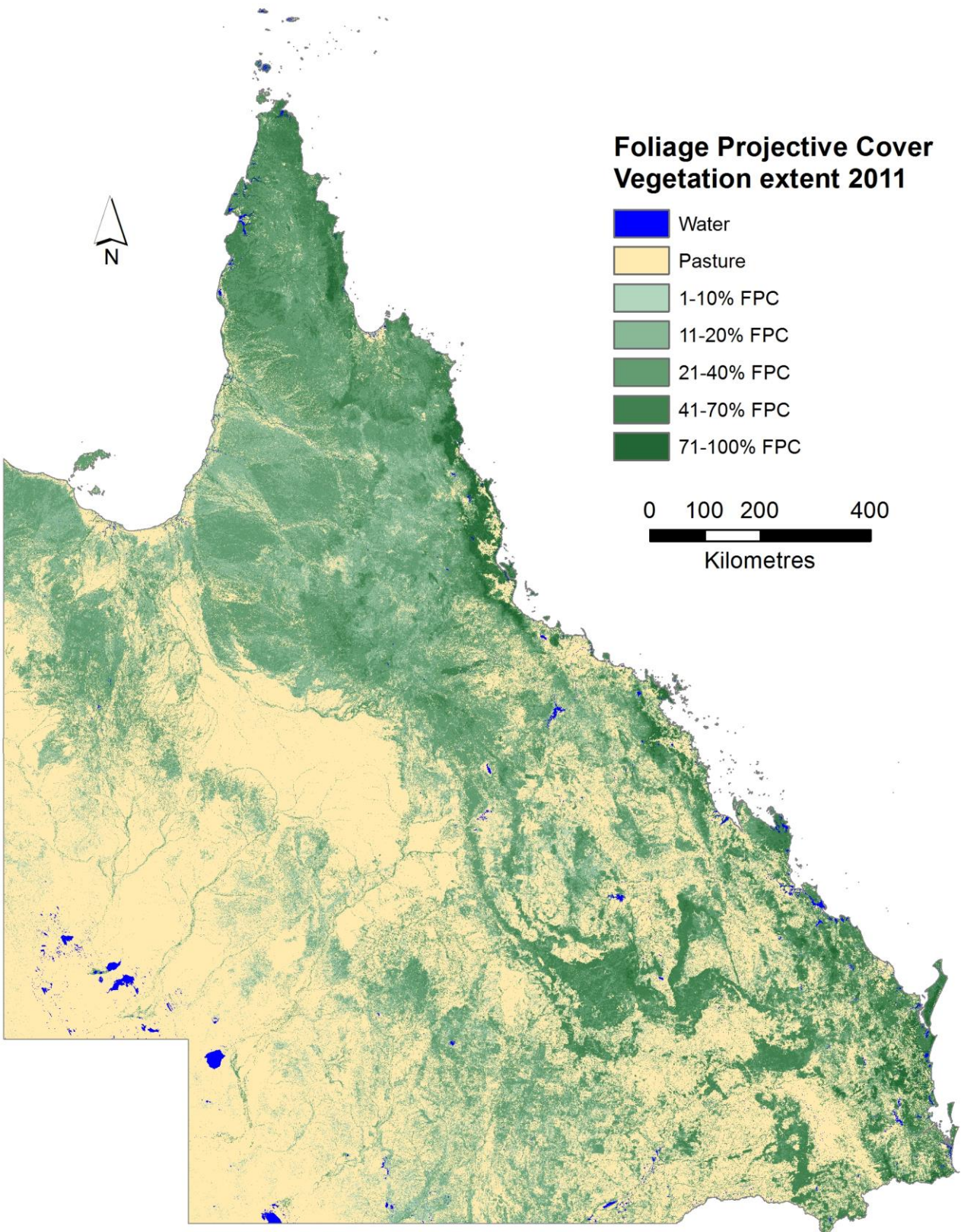


Figure 10: Wooded vegetation extent, FPC (2011)

Table 3: Wooded vegetation extent for Queensland (million ha)

SLATS Reports	Satellite and sensor	Resolution	Method (update in subsequent reports)	Year	Wooded extent mil ha (updated extent)	Wooded extent% of Qld (updated%)
1988-91	Landsat 5 TM	25m	3	1988	85.8	50
1991-95 1995-97 1997-99	AVHRR	1.1km	1	1991	76	44
1999-2001	Landsat 5 TM	25m	2	1999	81.4	47
2001-03	Landsat 5 TM	25m	2	2001	81.3	47
2001-03	Landsat 5 TM	25m	2	2003	80.2	46
2003-04 (2004-05, 2005-06)	Landsat 5 TM (and Landsat 7 ETM+)	25m	2 (4, 5)	2004*	79.8 (83.7, 89.4)	46 (48, 52)
2005-06 (2006-07)	Landsat 5 TM and Landsat 7 ETM+	25m	5 (6)	2005*	89.2 (90.0)	52 (52)
2005-06 (2006-07)	Landsat 5 TM and Landsat 7 ETM+	25m	5 (6)	2006*	89.0 (89.1)	51 (52)
2007-08	Landsat 5 TM and Landsat 7 ETM+	25m	6	2007	88.6	51
2008-09	Landsat 5 TM and Landsat 7 ETM+	25m	6	2008	88.1	51
2009-10	Landsat 5 TM and Landsat 7 ETM+	25m	6	2009	88.2	51
2010-11	Landsat 5 TM and Landsat 7 ETM+	25m	6	2010	87.3	51
2011-12	Landsat 5 TM and Landsat 7 ETM+	25m	6	2011	87.1	50

* Reported more than once with different methodology.

1. Time-series NDVI - AVHRR (Danaher *et al.* 1992)
2. Woody FPC Index 1991 - with clearing since 1991 removed from wooded extent (Kuhnell *et al.* 1998)
3. MRVI Wooded extent (Goulevitch *et al.* 2002)
4. Time-series wooded extent and FPC V2.0 (Kitchen *et al.* 2010)
5. Time-series wooded extent and FPC V2.1 (Kitchen *et al.* 2010)
6. Time-series wooded extent and FPC V2.3 (Kitchen *et al.* 2010)

4.2 Woody vegetation clearing by 7'30" x 7'30" Grid Cell (1:25 000 map sheet)

The average annual woody vegetation clearing rate over the period 2011–12 was 153 640 ha/year or 0.089% of the land area of Queensland. In total, this clearing rate represents an area of approximately 39 km x 39 km cleared per year.

A spatial view of the rate of clearing ('000 ha/year) within Queensland aggregated to 7'30" x 7'30" (latitude/longitude) grid cells is shown in Figure 11 (page 26) for 2011–12. These cells are the same size as a 1:25 000 map sheet, approximately 14 km x 14 km. Figure 12 (page 27) illustrates the mean annual clearing rate recorded across all previous SLATS eras. For a historic comparison, Appendix A (page 65) has a series of grid cell maps for each previous SLATS era.

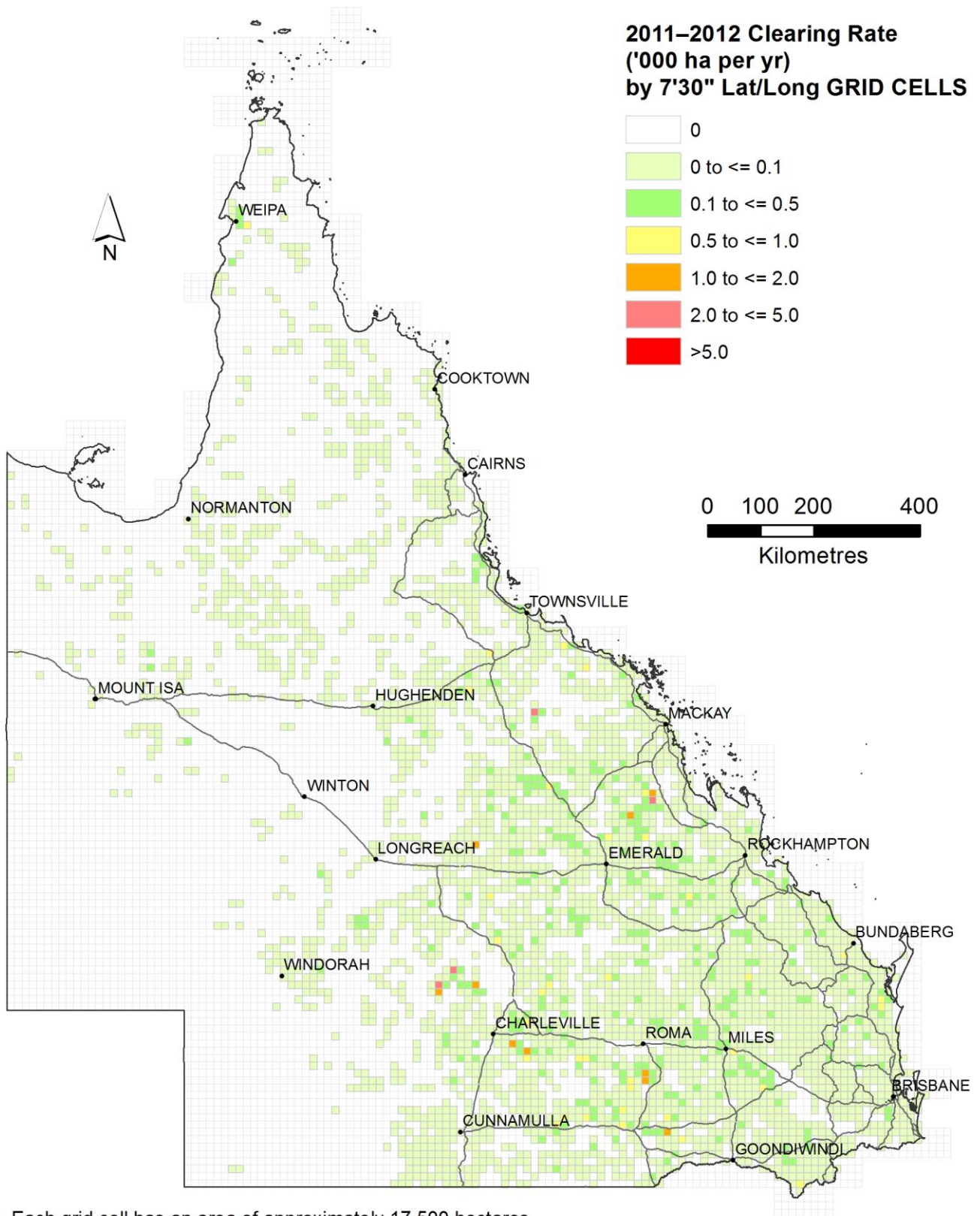
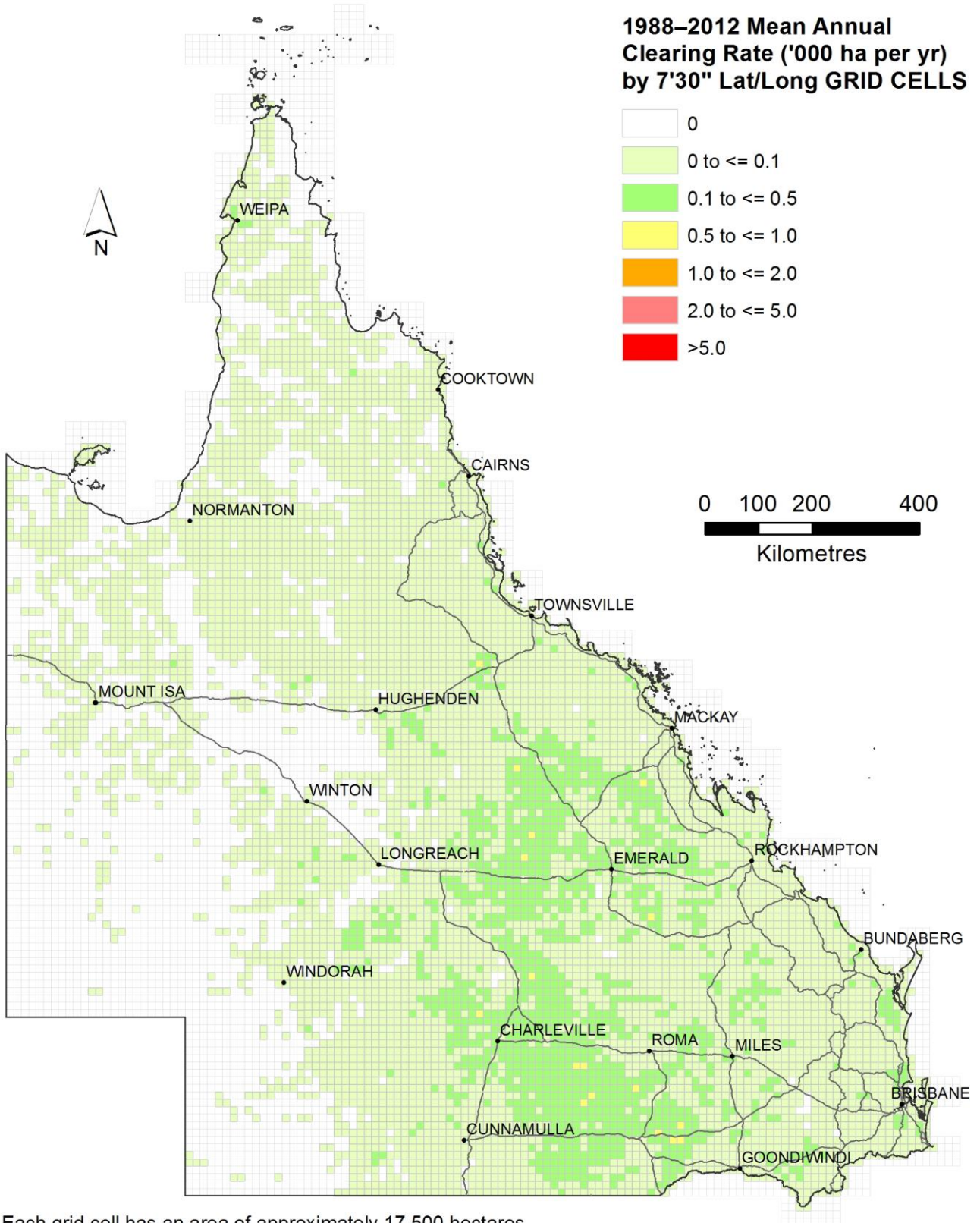


Figure 11: Average annual woody vegetation clearing rate (2011–12)



Each grid cell has an area of approximately 17,500 hectares.

Figure 12: Mean annual clearing rate (1988–2012)

4.3 Woody vegetation clearing by replacement

Woody vegetation clearing for all of the periods mapped between 1988 and 2012 is categorised by replacement land cover in Table 4 (below), and the time sequence presented in Figure 13 (page 29). The majority of woody vegetation clearing was for conversion to pasture for grazing purposes, while forestry was the second largest replacement land cover by area.

Table 4: Woody vegetation clearing by replacement land cover (1988–2012)

Period	Clearing	Pasture	Crop	Forest	Mining	Infra-structure	Settlement	Total
1988–1991	Rate (,000ha/yr)	649.12	55.79	3.27	2.43	16.01	3.05	729.66
	% of state clearing	88.96	7.65	0.45	0.33	2.19	0.42	100.00
1991–1995	Rate (,000ha/yr)	266.12	12.59	4.78	1.56	2.45	2.34	289.84
	% of state clearing	91.81	4.34	1.65	0.54	0.85	0.81	100.00
1995–1997	Rate (,000ha/yr)	292.74	29.40	4.70	2.68	8.25	2.51	340.28
	% of state clearing	86.03	8.64	1.38	0.79	2.42	0.74	100.00
1997–1999	Rate (,000ha/yr)	363.75	40.77	7.37	2.08	9.90	1.48	425.35
	% of state clearing	85.52	9.58	1.73	0.49	2.33	0.35	100.00
1999–2000	Rate (,000ha/yr)	716.40	19.98	6.50	1.44	11.49	1.98	757.79
	% of state clearing	94.54	2.64	0.86	0.19	1.52	0.26	100.00
2000–2001	Rate (,000ha/yr)	355.31	4.36	8.24	1.93	8.84	1.48	380.16
	% of state clearing	93.46	1.15	2.17	0.51	2.33	0.39	100.00
2001–2002	Rate (,000ha/yr)	481.49	0.73	5.70	1.69	6.66	1.63	497.90
	% of state clearing	96.70	0.15	1.14	0.34	1.34	0.33	100.00
2002–2003	Rate (,000ha/yr)	538.14	0.67	5.73	1.53	4.27	3.57	553.91
	% of state clearing	97.15	0.12	1.04	0.28	0.77	0.64	100.00
2003–2004	Rate (,000ha/yr)	464.47	0.37	3.58	3.42	6.99	3.53	482.36
	% of state clearing	96.29	0.08	0.74	0.71	1.45	0.73	100.00
2004–2005	Rate (,000ha/yr)	329.69	1.60	9.36	3.01	5.50	1.73	350.88
	% of state clearing	93.96	0.45	2.67	0.86	1.57	0.49	100.00
2005–2006	Rate (,000ha/yr)	356.99	0.26	10.27	3.56	2.26	1.80	375.13
	% of state clearing	95.17	0.07	2.74	0.95	0.60	0.48	100.00
2006–2007	Rate (,000ha/yr)	218.33	0.20	6.60	4.23	2.80	2.67	234.83
	% of state clearing	92.97	0.08	2.81	1.80	1.19	1.14	100.00
2007–2008	Rate (,000ha/yr)	103.50	0.15	10.06	3.81	2.47	2.77	122.78
	% of state clearing	84.30	0.12	8.20	3.10	2.02	2.26	100.00
2008–2009	Rate (,000ha/yr)	88.92	0.07	4.73	1.98	2.39	1.85	99.94
	% of state clearing	88.97	0.07	4.73	1.98	2.40	1.85	100.00
2009–2010	Rate (,000ha/yr)	64.58	0.09	6.94	2.99	1.66	1.33	77.59
	% of state clearing	83.23	0.12	8.94	3.85	2.14	1.72	100.00
2010–2011	Rate (,000ha/yr)	72.62	0.46	6.94	2.80	7.46	1.40	91.69
	% of state clearing	79.21	0.50	7.57	3.05	8.14	1.53	100.00
2011–2012	Rate (,000ha/yr)	134.45	0.39	7.11	5.84	4.53	1.33	153.64
	% of state clearing	87.50	0.25	4.63	3.80	2.95	0.87	100.00

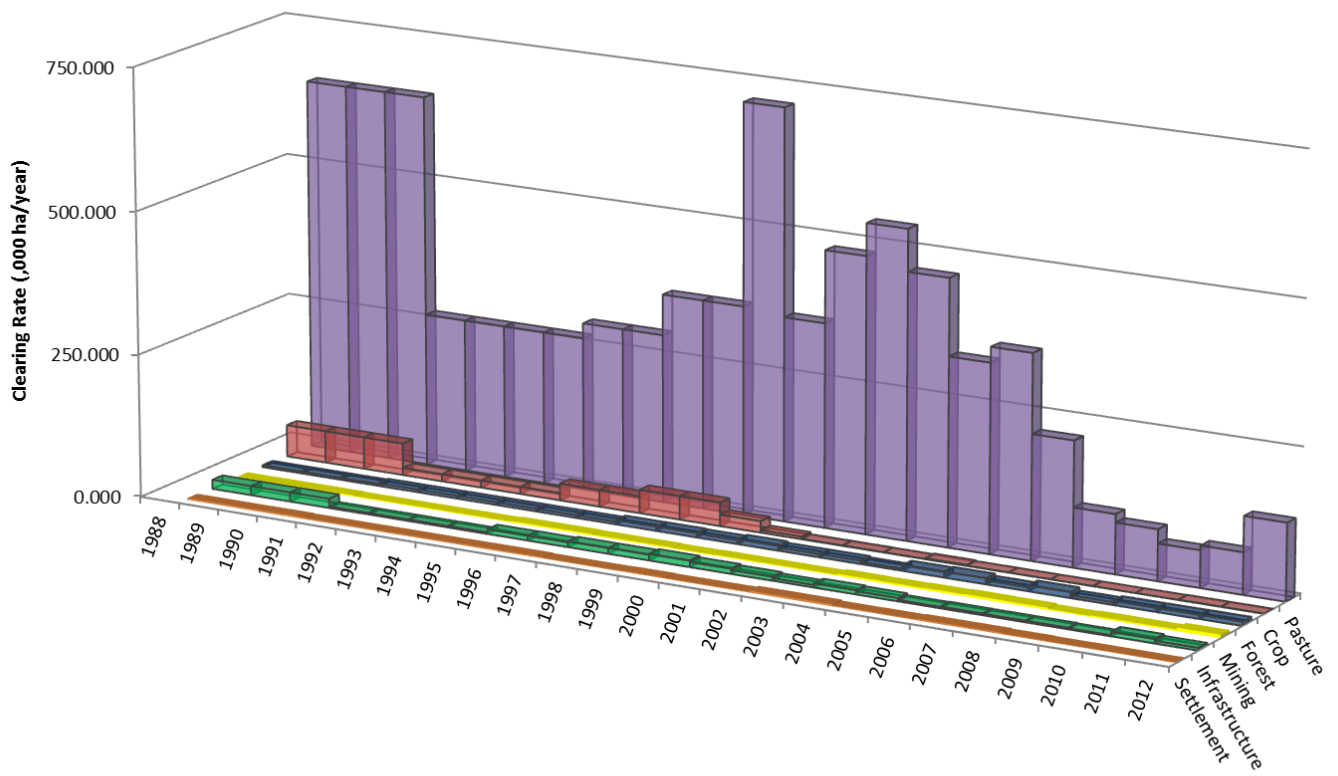


Figure 13: Trend in woody vegetation clearing rate by replacement land cover (1988–2012)

4.4 Woody vegetation clearing by tenure

Tenure data source

The tenure classes are derived from a 2010 extraction of the State's Digital Cadastral Database (DCDB) to give the best representation of the tenure prior to a clearing event in 2011–12. Leasehold tenure is the dominant tenure by area in Queensland. Figure 14 (page 31) is a map of the four broad tenure classes used in tables throughout this report.

Clearing by replacement cover class and tenure

The 2011–12 woody vegetation clearing rates have been grouped by replacement land cover and tenure in Table 5 (below), while Table 6 (page 32) and Figure 15 (page 33) show the woody vegetation clearing rate by tenure for the periods mapped between 1988 and 2012.

Table 5: Woody vegetation clearing by tenure type and replacement land cover (2011–12)

Tenure	Area (,000ha)	Clearing rate (,000ha/yr)							2011 Wooded vegetation cover ¹ (,000ha)	% of total clearing in QLD
		Pasture	Crop	Forestry	Mining	Infra- structure	Settle- ment	Total		
Freehold	45626	89.68	0.37	0.51	2.52	2.07	1.21	96.35	19899	62.71
Leasehold ²	115211	44.52	0.02	0.06	1.86	2.22	0.12	48.80	57308	31.76
Other tenures ³	441	0.14	0.00	0.00	1.37	0.01	0.00	1.52	406	0.99
Other reserves ⁴	11749	0.10	0.00	6.54	0.09	0.23	0.00	6.96	9448	4.53
Totals	173027	134.44	0.38	7.11	5.84	4.53	1.33	153.64	87061	100.00

¹ Based on the wooded extent and FPC index V2.3.

² Includes roads and rivers

³ Includes Commonwealth lands, mining, main roads, railways, ports, action pending etc.

⁴ State forest, timber reserves and national parks

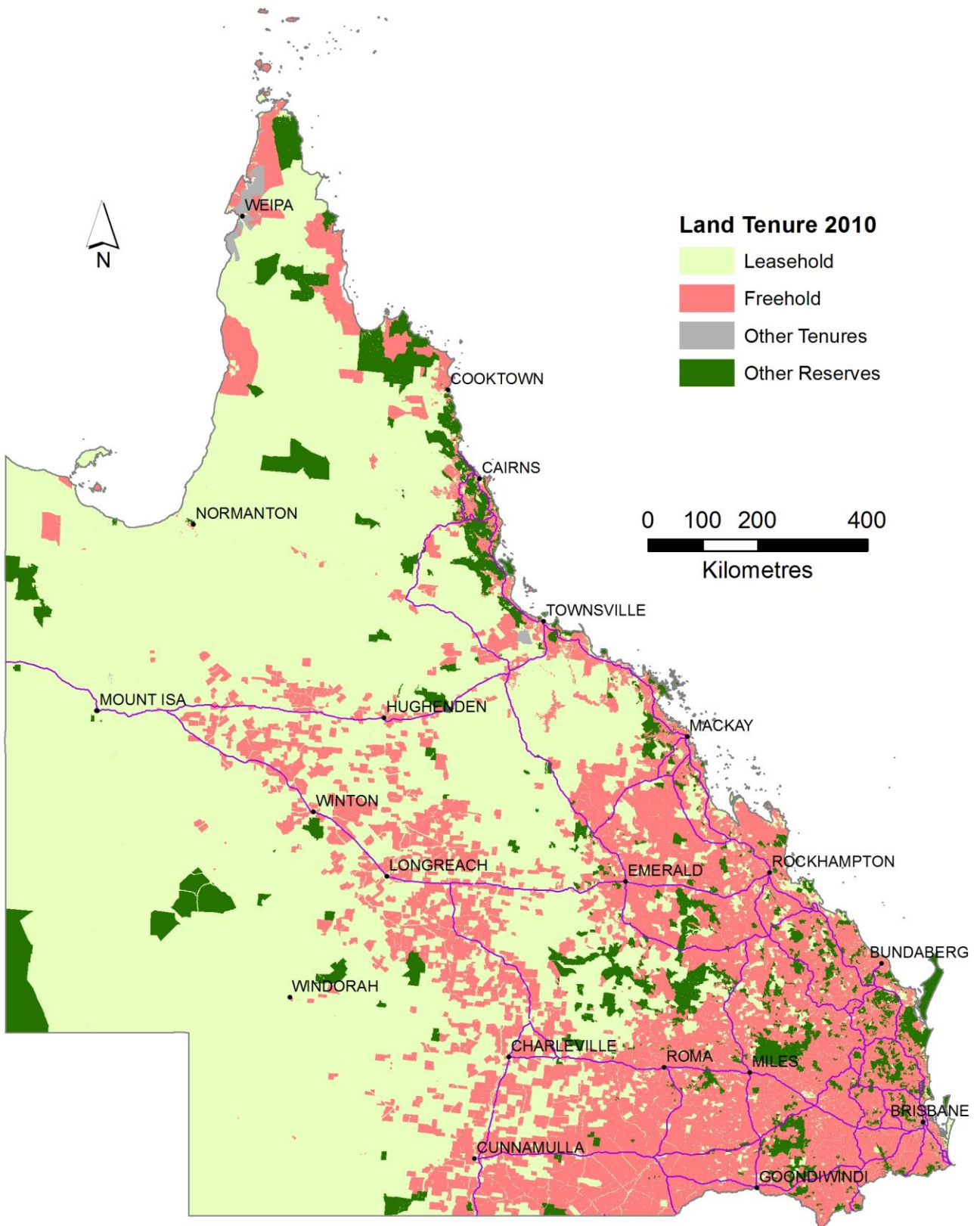


Figure 14: Land tenures in Queensland (2010)

Table 6: Woody vegetation clearing by land tenure (1988–2012)

Period	Clearing	Freehold	Leasehold	Other tenures	Other reserves	Total
1988–91	Rate (,000ha/yr)	333.25	384.22	5.74	6.46	729.66
	% of state clearing	45.67	52.66	0.79	0.88	100.00
1991–95	Rate (,000ha/yr)	127.72	155.72	1.57	4.83	289.84
	% of state clearing	44.07	53.73	0.54	1.67	100.00
1995–97	Rate (,000ha/yr)	197.97	134.03	3.10	5.18	340.28
	% of state clearing	58.04	39.53	0.91	1.52	100.00
1997–99	Rate (,000ha/yr)	254.39	161.40	3.06	6.50	425.35
	% of state clearing	59.81	37.95	0.72	1.53	100.00
1999–2000	Rate (,000ha/yr)	497.29	254.00	0.78	5.71	757.79
	% of state clearing	65.62	33.52	0.10	0.75	100.00
2000–01	Rate (,000ha/yr)	169.95	202.65	0.74	6.82	380.16
	% of state clearing	44.70	53.31	0.20	1.79	100.00
2001–02	Rate (,000ha/yr)	247.18	239.62	4.86	6.23	497.90
	% of state clearing	49.65	48.13	0.98	1.25	100.00
2002–03	Rate (,000ha/yr)	323.50	224.02	0.28	6.11	553.91
	% of state clearing	58.40	40.44	0.05	1.10	100.00
2003–04	Rate (,000ha/yr)	267.63	206.28	1.25	7.20	482.36
	% of state clearing	55.48	42.77	0.26	1.49	100.00
2004–05	Rate (,000ha/yr)	191.68	150.11	0.97	8.12	350.88
	% of state clearing	54.63	42.78	0.28	2.31	100.00
2005–06	Rate (,000ha/yr)	198.01	168.47	1.55	7.06	375.09
	% of state clearing	52.79	44.91	0.41	1.88	100.00
2006–07	Rate (,000ha/yr)	112.63	112.46	1.97	7.77	234.83
	% of state clearing	47.96	47.89	0.84	3.31	100.00
2007–08	Rate (,000ha/yr)	63.88	47.58	1.98	9.34	122.78
	% of state clearing	52.03	38.75	1.61	7.61	100.00
2008–09	Rate (,000ha/yr)	45.09	48.92	1.02	4.90	99.94
	% of state clearing	45.12	48.95	1.02	4.90	100.00
2009–10	Rate (,000ha/yr)	42.50	27.42	0.62	7.05	77.59
	% of state clearing	54.78	35.34	0.80	9.08	100.00
2010–11	Rate (,000ha/yr)	55.21	29.17	0.33	6.98	91.69
	% of state clearing	60.22	31.81	0.36	7.61	100.00
2011–12	Rate (,000ha/yr)	96.35	48.80	1.52	6.96	153.64
	% of state clearing	62.71	31.76	0.99	4.53	100.00

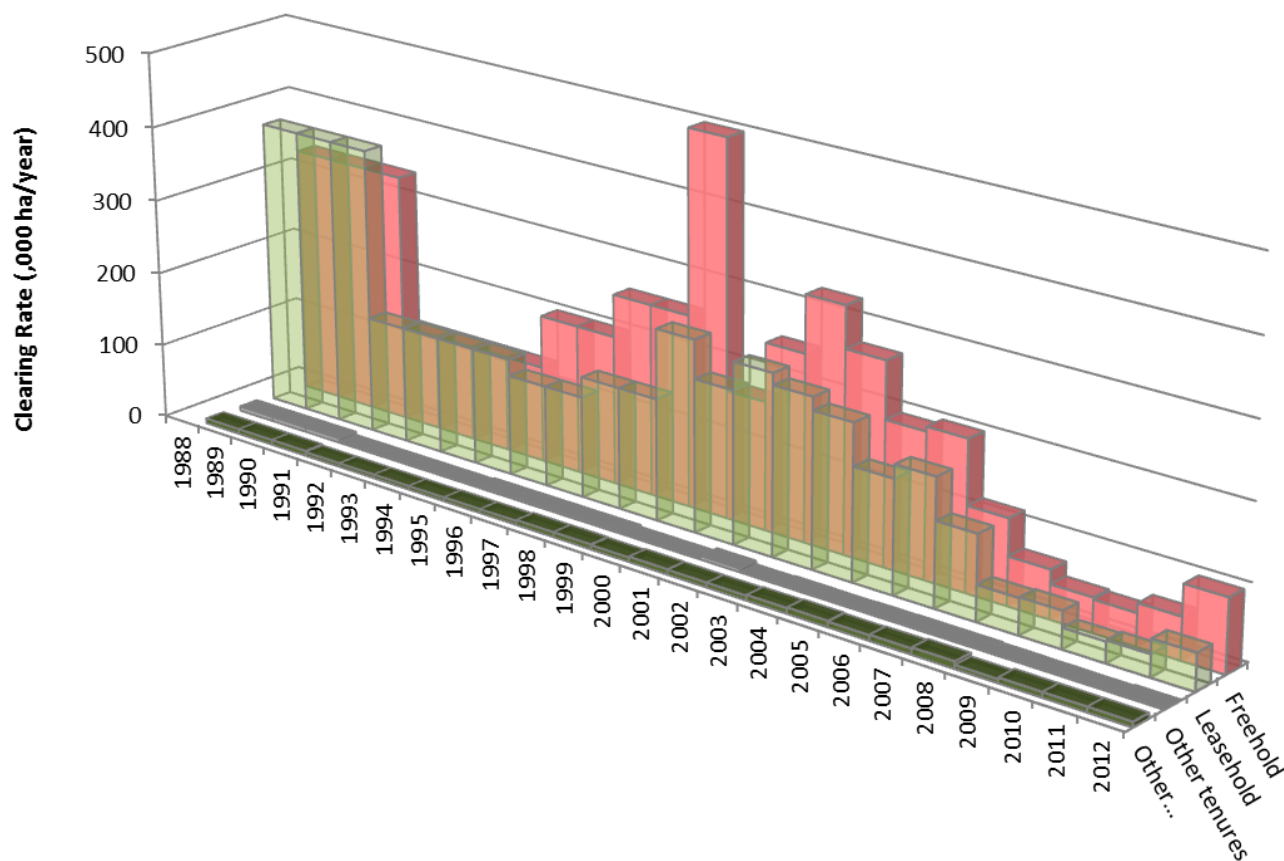


Figure 15: Woody vegetation clearing trend by tenure (1988–2012)

4.5 Woody vegetation clearing by remnant status

Definition of remnant vegetation

Remnant vegetation is defined by the VMA as vegetation forming the predominant canopy of the vegetation:

- Covering more than 50% of the undisturbed predominant cover, and averaging more than 70% of the vegetation's undisturbed height and;
- is dominated by species characteristic of the vegetation's undisturbed canopy.

Remnant vegetation is shown as category B areas on the regulated vegetation management map.

An undisturbed stratum (or layer) is defined as one that shows no evidence of extensive mechanical or chemical disturbance, such as logging, clearing or poisoning, during field inspections or on the available historical aerial photographic record. This definition of remnant vegetation includes woody vegetation, non-woody vegetation such as grasses, and areas of remnant vegetation as defined by the RE mapping (Queensland Herbarium 2012). Accad *et al.*, (2013) provides a comprehensive report for regional ecosystems (woody and non-woody remnant vegetation) from 1997 to 2011.

Definition of high-value regrowth

Under the VMA, HVR was shown on the now repealed Regrowth Vegetation Map and included mature regrowth not cleared since 31 December 1989, and vegetation within 50m of certain watercourses in the priority Great Barrier Reef catchments of the Burdekin, Mackay – Whitsundays and Wet Tropics. HVR regulations applied to freehold, indigenous and agricultural and grazing leasehold land. Amendments to the VMA in 2013 removed the regulation of HVR clearing from freehold and indigenous land.

Clearing by remnant and regulated regrowth status

To define remnant status of woody vegetation clearing, SLATS 2011–12 clearing data were intersected with Version 8.0 (Queensland Herbarium 2012) remnant vegetation data. A similar intersection with remnant status has previously been done for the periods from 1995–2011. With the introduction of HVR mapping, 2011–12 woody vegetation clearing was also intersected with the HVR data to identify HVR amongst the non-remnant clearing.

Figure 16 (below) shows the clearing rate for vegetation mapped as remnant, HVR and non-remnant for each tenure class.

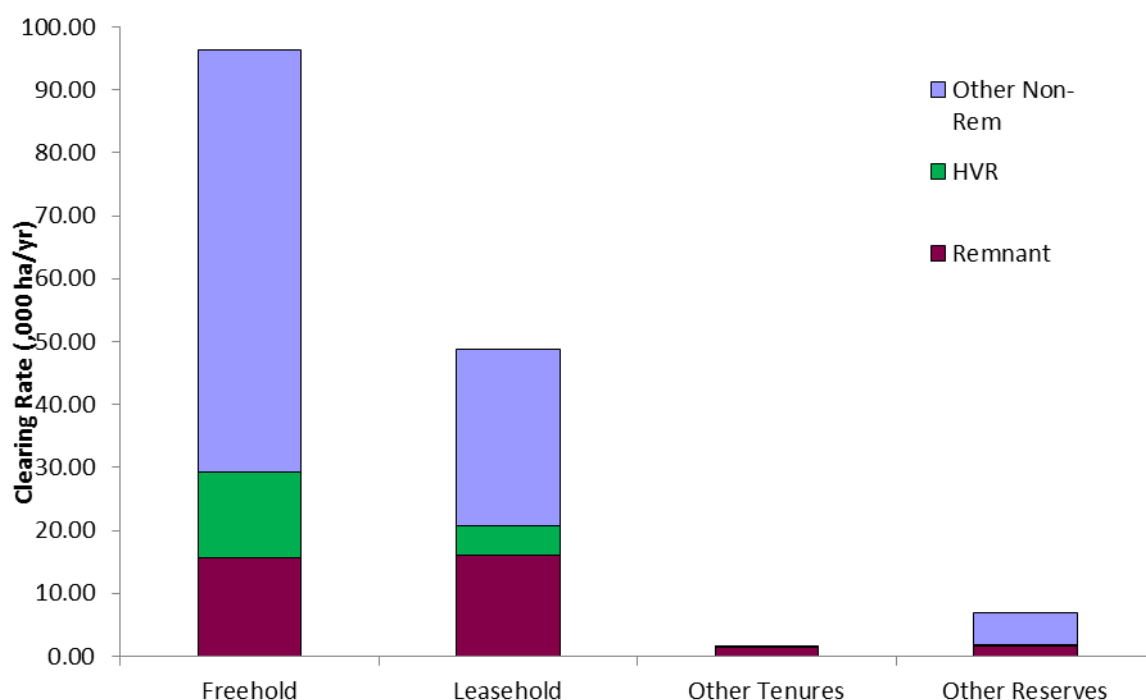


Figure 16: Clearing woody vegetation by tenure split by vegetation status (2011–2012)

The following SLATS figures (Table 7, page 35) refer to the clearing of remnant, HVR and non-remnant woody vegetation. For periods prior to 2011–12, remnant and non-remnant figures are copied from previous SLATS reports, and not updated using more recent RE data. The 1988–95 change data was not included in the analysis because 1995 is the earliest year for which RE maps were available. Also, RE mapping was incomplete at the time of the 1995–97 and 1997–99 SLATS change reporting. Hence, the remnant clearing rates for these periods were based on an extrapolation of a sample of clearing for which RE mapping was available. The sample contained greater than 90% of the total state clearing area.

Table 7: Area cleared of remnant and non-remnant woody vegetation by tenure (1995–2012)

Period	Remnant Status	Clearing rate (,000ha/yr)				
		Freehold	Leasehold ¹	Other tenures ²	Other reserves ³	Total
1995–97	Remnant	125.2	95.9	2.6	3.5	227.2
	Non-remnant	72.8	38.1	0.5	1.7	113.1
1997–99	Remnant	168.2	113.6	2.6	1.9	286.3
	Non-remnant	86.1	47.8	0.4	4.6	138.9
1999–2000	Remnant	322.63	179.90	0.73	1.50	504.75
	Non-remnant	174.66	74.11	0.05	4.21	253.04
2000–01	Remnant	76.21	134.13	0.71	1.96	213.01
	Non-remnant	93.74	68.52	0.03	4.86	167.16
2001–02	Remnant	121.07	152.86	0.01	1.54	275.48
	Non-remnant	126.12	91.51	0.11	4.69	222.42
2002–03	Remnant	181.15	183.41	0.21	1.14	365.91
	Non-remnant	142.35	40.61	0.07	4.97	188.00
2003–04	Remnant	133.85	130.82	0.96	1.63	267.25
	Non-remnant	133.78	75.46	0.29	5.57	215.10
2004–05	Remnant	59.96	108.78	0.79	2.60	172.13
	Non-remnant	131.72	41.33	0.18	5.52	178.75
2005–06	Remnant	85.08	134.89	0.90	1.48	222.35
	Non-remnant	112.93	33.57	0.65	5.59	152.74
2006–07	Remnant	46.24	79.58	1.86	1.49	129.17
	Non-remnant	66.40	32.87	0.11	6.28	105.66
2007–08	Remnant	23.97	27.11	1.74	3.43	56.25
	Non-remnant	39.91	20.47	0.24	5.92	66.53
2008–09	Remnant	15.40	19.77	0.93	1.58	37.68
	Non-remnant	29.70	29.15	0.09	3.32	62.26
2009–10	Remnant	11.96	10.54	0.57	0.99	24.06
	Non-remnant	30.54	16.88	0.05	6.06	53.53
2010–11	Remnant	12.69	11.51	0.32	1.53	26.05
	HVR Regrowth	11.91	3.23	0.00	0.04	15.18
	Non-remnant	30.61	14.43	0.01	5.41	50.46
2011–12	Remnant	15.62	16.00	1.39	1.57	34.58
	HVR Regrowth	13.66	4.79	0.02	0.25	18.72
	Non-remnant	67.07	28.01	0.11	5.14	100.34

¹ Includes roads and rivers² Includes Commonwealth lands, mining, main roads, railways, ports, action pending etc.³ State forest, timber reserves and national parks

4.6 Woody vegetation clearing by foliage projective cover and basal area

Woody vegetation clearing related to the Wooded Extent and FPC product V2.3

Recent methods for mapping FPC have enabled more accurate mapping of woody vegetation cover, particularly in areas of regrowth. The time series model was used to compute the wooded vegetation extent and FPC (V2.3) for 2005–11. This was then intersected with the 2005–12 woody vegetation clearing to produce the frequency distribution graph in Figure 17 (below) for FPC of 1% or more. The corresponding intersection with basal area produces the graph in Figure 18 (page 37).

The two graphs have a very similar shape – including the same peak FPC value – when compared. The highest frequency of woody vegetation clearing occurs at 21% FPC or 8.4 m²/ha basal area for 2011–12, using the wooded vegetation extent and FPC V2.3 (Figures 17 and 18). This is similar to the 1991 baseline FPC intersection shown in previous SLATS reports. The main difference is that the area under the curve (amount of woody vegetation clearing) is higher with the wooded vegetation extent and FPC V2.3, due primarily to the relatively lower omission of woody regrowth in the FPC analysis. Previously, regrowth was given a low FPC or zero FPC if not identified and mapped as regrowth. It should be noted that when interpreting Figure 18 (clearing by basal area), the relationship between FPC and basal area has only been validated for mature forests (Armston *et al.*, 2009). The basal area of regrowth may be overestimated.

Furthermore, woody regrowth is often omitted in the wooded extent classification and mapped as 0% FPC, despite being mapped as woody change. For 2011-12 this was 31.5% of the total cleared area, which is higher than the previous era's proportion of 24.2% due to the relatively higher proportion of woody regrowth clearing occurring this era. This is evident in both figures 19 and 20 (on page 39 and on page 40 respectively).

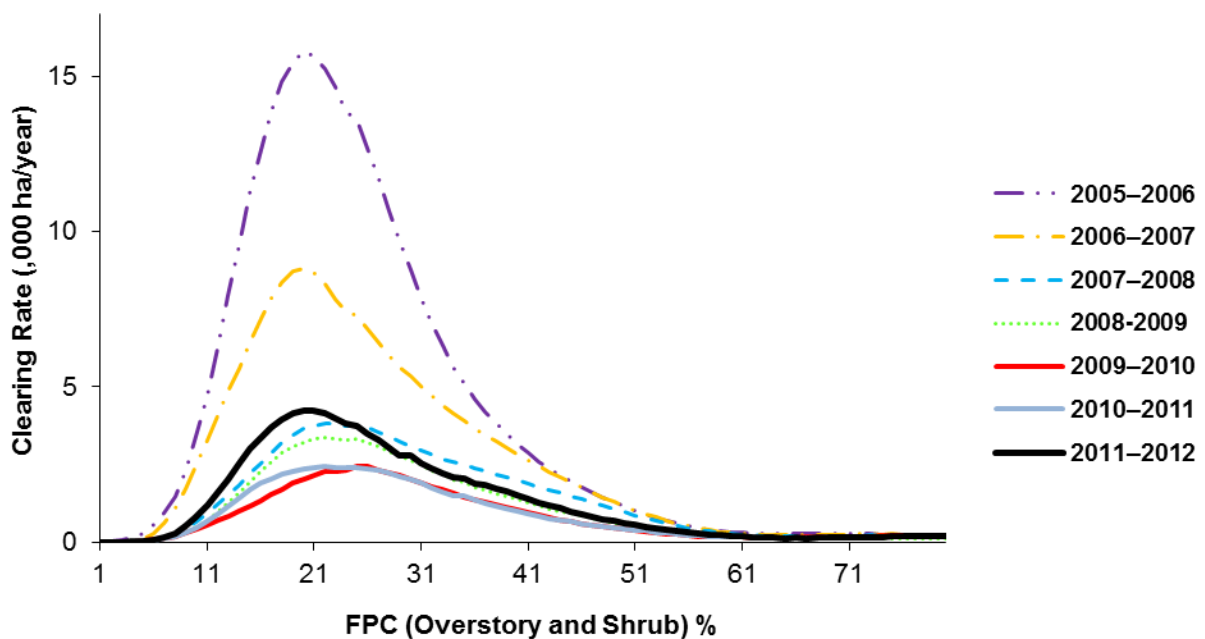


Figure 17: Frequency distributions of woody vegetation clearing using the FPC Index V2.3

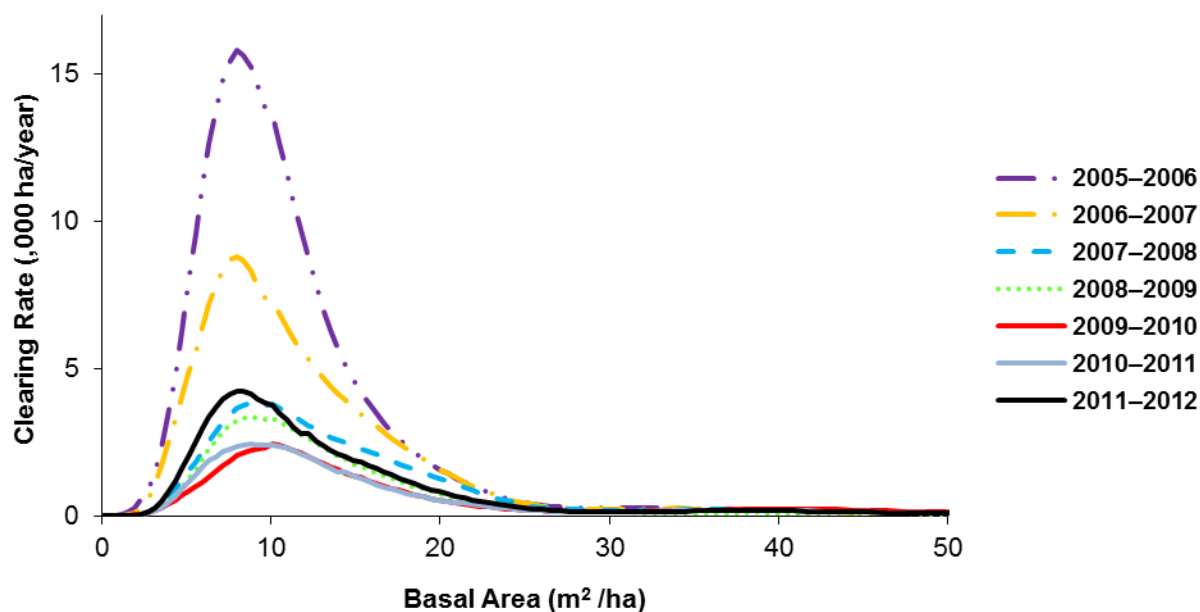


Figure 18: Frequency distributions of woody vegetation clearing using basal area derived from the FPC Index V2.3

Woody vegetation clearing by Carnahan cover class and mapping

The state woody vegetation clearing data for each SLATS era were intersected with the vegetation cover classes from the 1:5 000 000 Carnahan present vegetation map (Carnahan, 1988). The results are shown in Appendix B (page 69). The 2011–12 clearing across Carnahan vegetation classes is shown in Table 8 (page 38). Not all vegetation classes in which woody vegetation clearing occurred have been included in Table 8.

In the previous national and state greenhouse gas inventories, woody vegetation clearing was grouped into three vegetation types that are combinations of Carnahan classes. The three groups are tropical and temperate closed forests (T4, M4, L4, T3), dense woodlands and open forests (M3, L3), and open woodlands (M2, L2). In Queensland, additional classes with extensive clearing were added to the open woodland class.

The Carnahan classes are geographically large and represent the dominant vegetation formation, but may also include significant areas of other vegetation types. Apparent anomalies, such as no clearing in T4 (trees > 30 m height and 70% foliage cover) in Queensland, may be attributed to this aggregation of woodland classes. A small area of the state does not have a Carnahan mapping class, and therefore totals in Table 8 can differ slightly to other totals shown in the report.

Table 8: Woody vegetation clearing by Carnahan present vegetation map class (2011–2012)

Carnahan vegetation class	Description	Clearing 2011–12	
		Rate (,000ha/yr)	% of State clearing total
M1	Medium trees (10–30 m) <10% foliage cover	35.42	23.29
M2	Medium trees (10–30 m) 10–30% foliage cover	49.48	32.54
M3	Medium trees (10–30 m) 30–70% foliage cover	10.19	6.70
M4	Medium trees (10–30 m) >70% foliage cover	0.63	0.42
L1	Low trees (<10 m) <10% foliage cover	13.07	8.60
L2	Low trees (<10 m) 10–30% foliage cover	11.80	7.76
L3	Low trees (<10 m) 30–70% foliage cover	0.09	0.06
L4	Low trees (<10 m) >70% foliage cover	0.02	0.01
S1	Tall shrubs (>2 m) <10% foliage cover	0.77	0.50
S2	Tall shrubs (>2 m) 10–30% foliage cover	0.01	0.01
Z1	Low shrubs (<2 m) <10% foliage cover	0.00	0.00
Z3	Low shrubs (<2 m) 30–70% foliage cover	0.01	0.01
F3	Other herbaceous plants 30–70% foliage cover	0.00	0.00
F4	Other herbaceous plants >70% foliage cover	1.87	1.23
G2	Tussocky or tufted grasses 10–30% foliage cover	2.06	1.35
G3	Tussocky or tufted grasses 30–70% foliage cover	25.85	17.00
G4	Tussocky or tufted grasses 70% foliage cover	0.78	0.51
H2	Hummock grasses 10–30% foliage cover	0.00	0.00
Total		152.06	100.00

4.7 Woody vegetation clearing by biomass

It is estimated that approximately 11.72 Mt of dry biomass or 5.86 Mt of carbon were cleared during the 2011–12 era. This is up 35.7% from 8.63 Mt of biomass and 4.32 Mt of carbon in 2010–11. The estimated eventual emission of CO₂ from all clearing (above and below ground live woody biomass) for 2011–12 is 21.50 Mt. This represents an increase of 5.66 Mt relative to the previous era (2010–11).

At this stage no account is made for cleared and dead woody debris or low biomass found in regrowth communities. While the biomass cleared will eventually decay, the rate of release of CO₂ depends on the clearing method, post clearing management of woody debris and climate factors (Henry *et al.*, 2002).

4.8 Clearing trends 1988–2012

SLATS has produced estimates of annual clearing rates from winter 1988 to winter 2012. Figure 19 (below) illustrates the clearing rate for all woody vegetation, and the proportion with a FPC value greater than or equal to 11%. The greatest difference between the two estimates will be in years with a high proportion of young regrowth clearing or high amounts of clearing in western areas, where FPC is generally lower. There is less difference between the two estimates in terms of carbon loss, as areas with less than 20% canopy cover have low biomass.

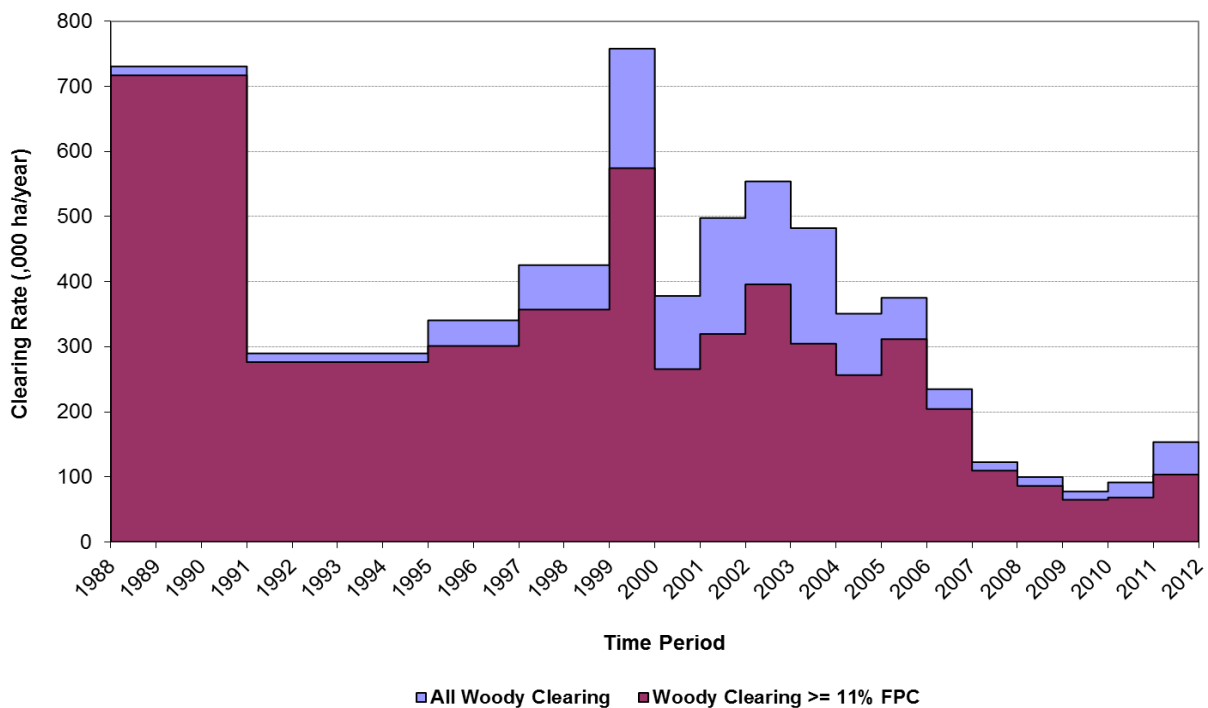


Figure 19: Clearing trends 1988–2012.¹

¹ Do not aggregate clearing rates from individual years to give an overall estimate of rate of clearing. Clearing of regrowth, following earlier failed clearing, can contribute significantly to the total.

Through analysis of the annual clearing rates from 1988 to 2012, SLATS has compiled statistics showing the number of repeat clearing events within each era. Figure 20 (below) illustrates the woody vegetation clearing rate for all woody vegetation clearing, and the proportion which has been previously detected in earlier land cover change eras.

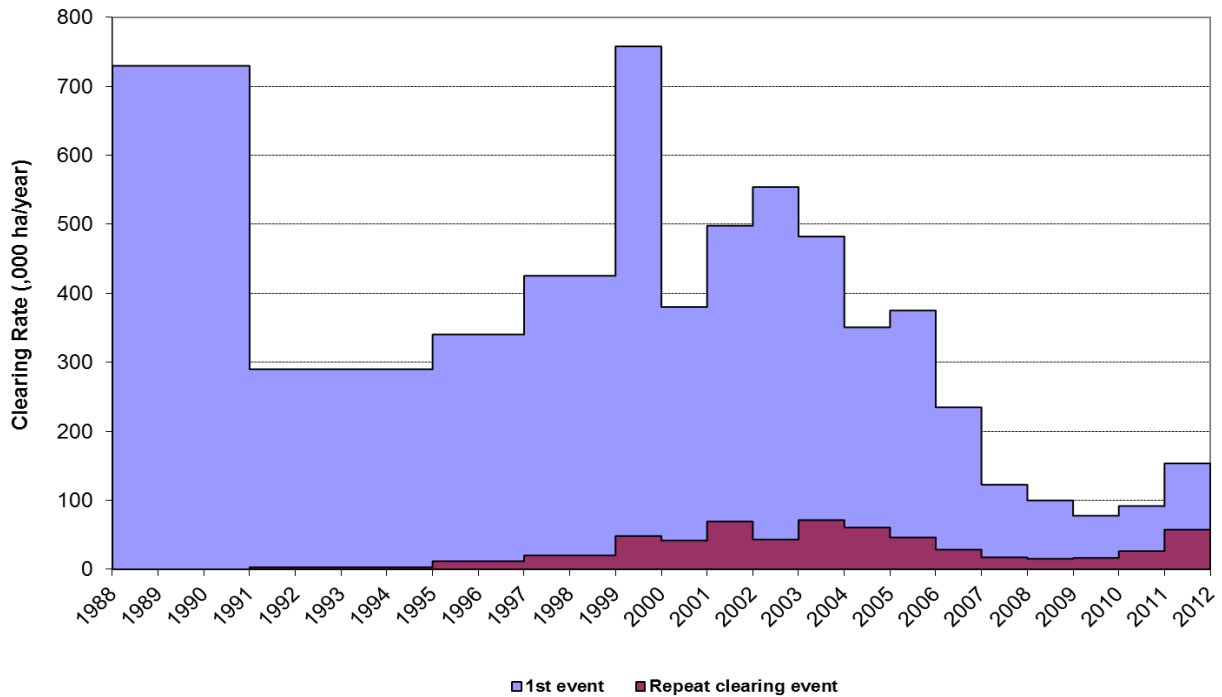


Figure 20: Time series for clearing rates for initial and repeat clearing events (1988–2012).

For the 2011–12 era, of the 153 640 ha/year cleared, 57 650 ha/year (38%) has previously been detected as woody vegetation clearing. Table 9 (on page 41) shows the rates of woody vegetation change for repeat clearing events for each era.

Table 9: Woody vegetation clearing by repeat incidence (1988–2012)

Period	Rate of woody vegetation change (,000ha/yr) for repeated clearing events					
	1 st event	2 nd event	3 rd event	4 th event	Total	% of repeat clearing
1988–91	729.70	0.00	0.00	0.00	729.70	0.00
1991–95	286.71	3.09	0.00	0.00	289.80	1.07
1995–97	328.49	11.80	0.00	0.00	340.30	3.47
1997–99	405.04	20.20	0.07	0.00	425.30	4.76
1999–2000	709.56	47.93	0.30	0.00	757.78	6.36
2000–01	338.45	41.45	0.30	0.00	380.20	10.98
2001–02	428.61	67.95	1.34	0.00	497.90	13.92
2002–03	510.72	42.40	0.79	0.00	553.91	7.80
2003–04	410.88	69.21	2.25	0.01	482.36	14.82
2004–05	290.16	58.50	2.20	0.02	350.88	17.30
2005–06	328.77	44.47	1.87	0.03	375.13	12.36
2006–07	206.30	26.96	1.55	0.02	234.83	12.15
2007–08	105.44	16.19	1.11	0.03	122.78	14.11
2008–09	84.70	14.41	0.81	0.01	99.94	15.25
2009–10	61.14	15.44	0.99	0.02	77.59	21.21
2010–11	65.37	23.75	2.49	0.08	91.69	28.71
2011–12	95.99	52.01	5.16	0.48	153.64	37.52

Section 5 Regional assessment of woody vegetation clearing

SLATS analysed woody vegetation change by using Geographic Information System (GIS) overlays to calculate the rate of woody vegetation clearing as a percentage of the area of 2011 wooded vegetation extent. SLATS also calculated the remaining wooded vegetation cover in 2011, by different regions.

The following GIS layers were used:

1. Biogeographic regions and sub-regions version 5.0 (section 5.1, page 42)
2. Catchments (section 5.2, page 48)
3. Local government areas (section 5.3, page 52)
4. Natural Resource Management regions (section 5.4, page 54)
5. Queensland native pasture communities (section 5.5, page 57).

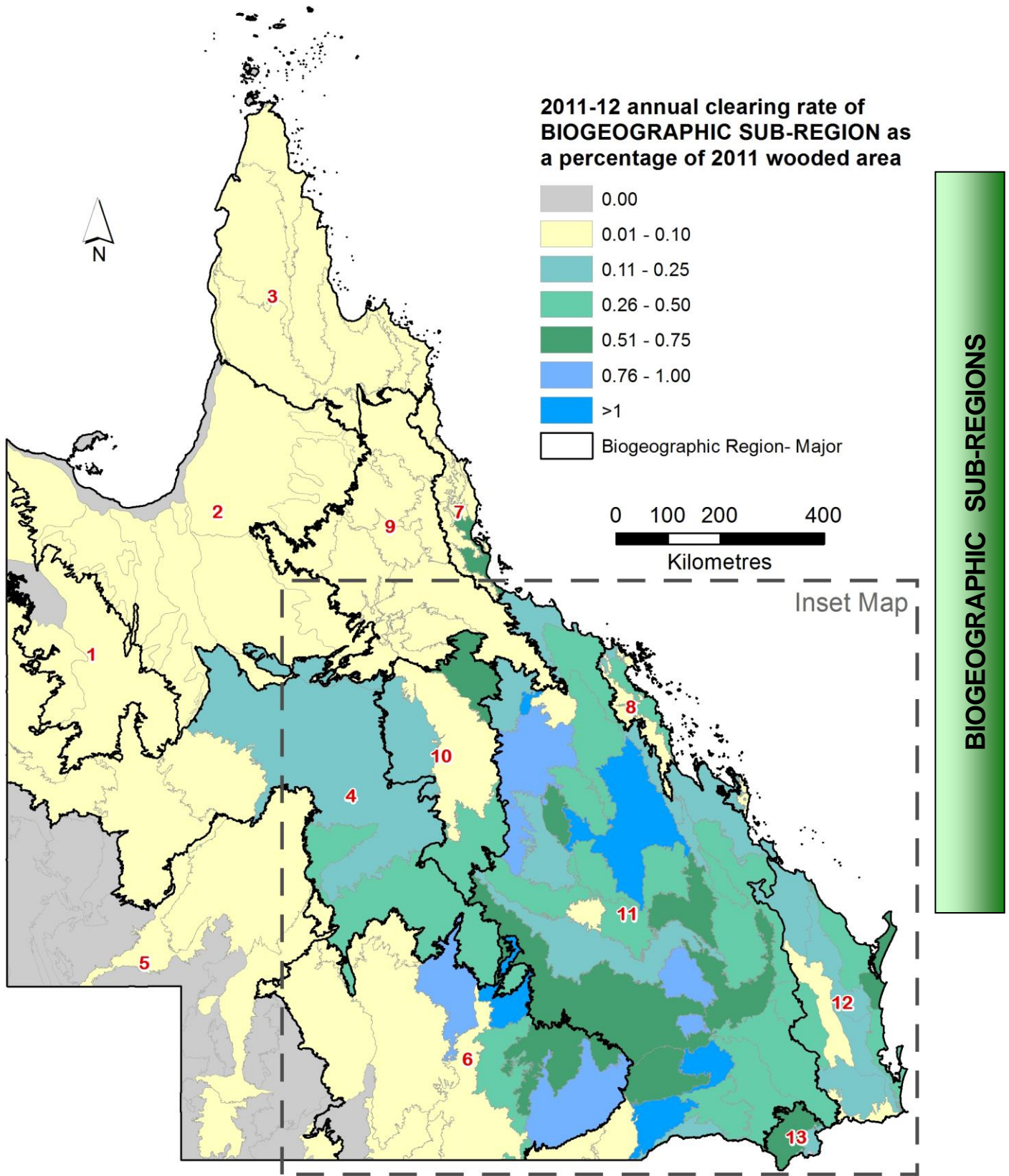
Woody vegetation clearing totals were compiled for each of the GIS layers (1–4 above) and statistics for each are provided in map and tabular forms. A similar analysis was completed for native pasture communities, but these statistics are presented in tabular form only (Table 15, page 58). The extent of native pasture communities in Queensland is displayed in Figure 29 (page 57). Note that in the catchment GIS layer, some of the small coastal catchments have been amalgamated and named after one of the rivers—for example, the amalgamated Sunshine Coast catchments are called Maroochy. This report contains only a selection of possible data tables. Spreadsheets containing additional data are available on request. See page 60 for contact details.

5.1 Woody vegetation clearing by biogeographic region and sub-region

The clearing rate for the biogeographic regions is shown in Table 10 (page 46). Appendix C (page 75) has a full analysis of clearing rates for the sub-regions, broken down by tenure and replacement cover. The maps shown in Figure 21 (page 43) and Figure 22 (page 44) show the percentage of woody vegetation cleared for each biogeographic sub-region.

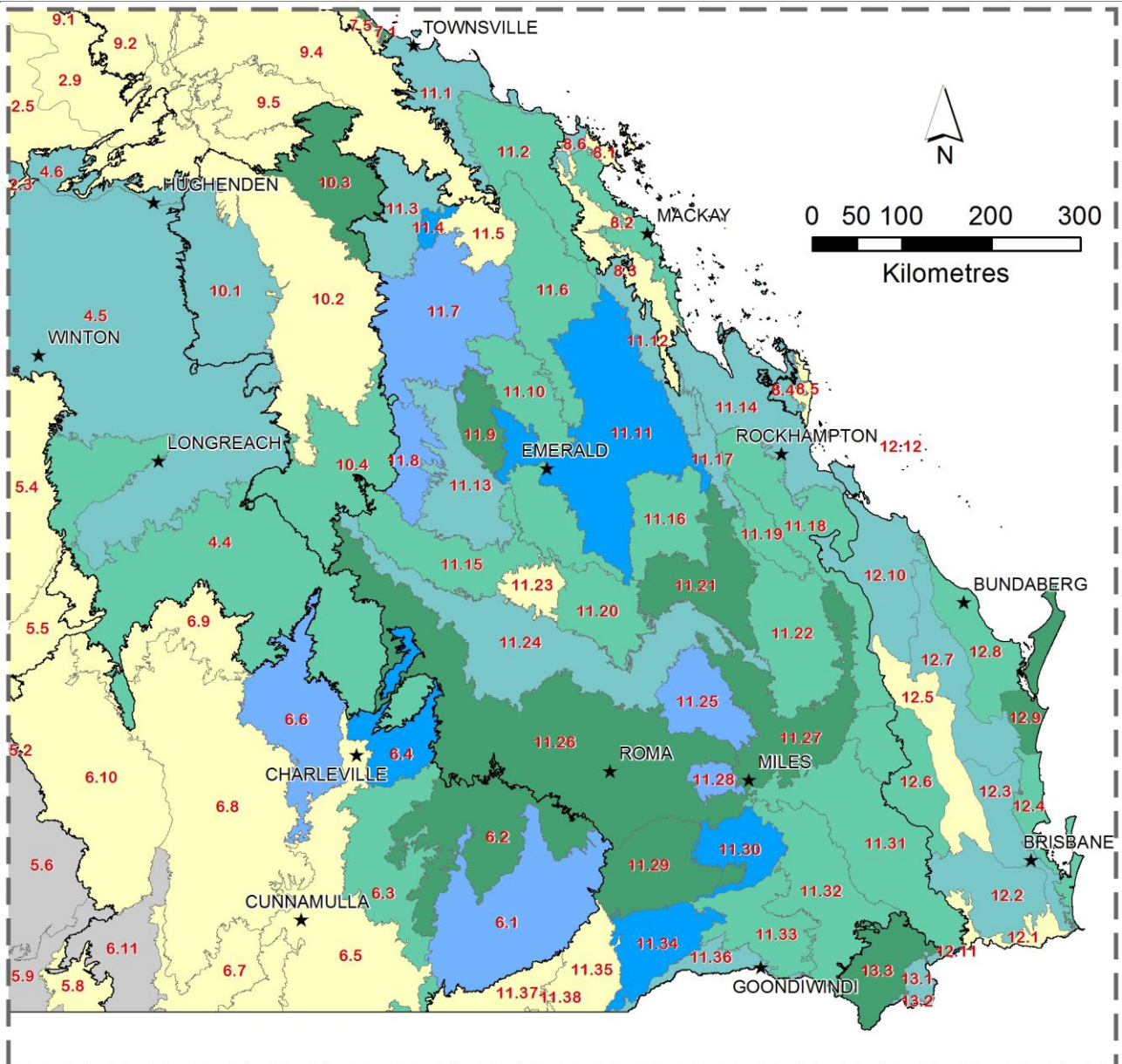
Results

- The Brigalow Belt biogeographic region, with 87 700 ha/year (57% of total clearing) for 2011–12, continued to represent the highest woody vegetation clearing rate. This is nearly double the 45 000 ha/year clearing rate reported for the 2010–11 era (Table 11, page 47).
- The second highest clearing rate occurred in the Mulga Lands biogeographic region (29 360 ha/year), representing an increase of 49% from the previous era (Table 11, page 47).
- Within the Brigalow Belt biogeographic region, 18% of the total woody vegetation clearing was defined as remnant, while in the Mulga Lands the figure was 24% (Table 11, page 47).

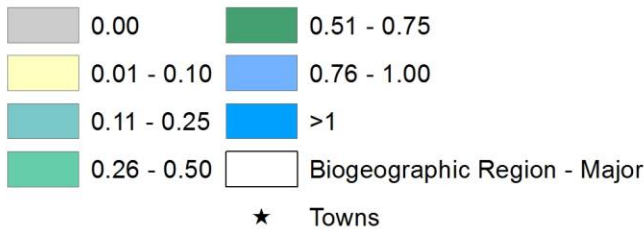


NOTE: Numbers on the face of the map refer to the biogeographic region, Colours indicate the overall coverage for sub-regions and do not indicate the location of specific wooded areas within them.

Figure 21: Average annual woody vegetation clearing rate as a percentage of 2011 wooded area by biogeographic sub-region (2011–12)



INSET: 2011-12 annual clearing rate of BIOGEOGRAPHIC SUB-REGIONS as a percentage of 2011 wooded area



NOTE: Numbers on the face of the map refer to the sub-region reference number in the accompanying table.

The first number represents the bioreographic region, The second number identifies the sub-region

Colours indicate the overall coverage for sub-regions and do not indicate the location of specific wooded areas within them.

Figure 22: Inset: Average annual woody vegetation clearing rate as a percentage of 2011 wooded area by biogeographic sub-region (2011–12)

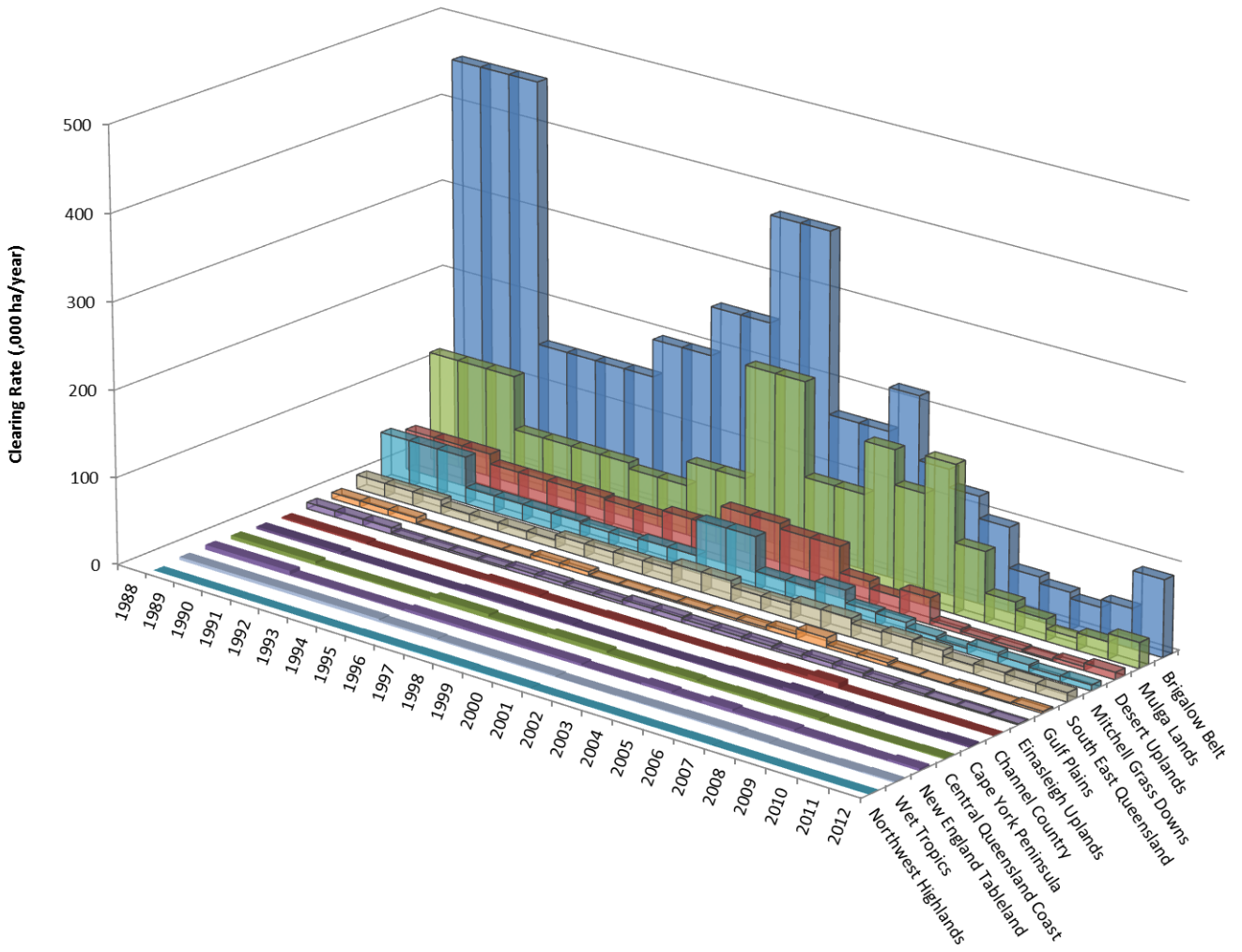


Figure 23: Trend in bioregions woody vegetation clearing rates (1988–2012)

Table 10: Woody vegetation clearing by replacement land cover by biogeographic region (2011–12)

Biogeographic region			Rate of woody vegetation change (,000ha/yr) for							% wooded vegetation cover 2011 ¹	% total clearing in Qld
Name	Map Ref	Area (,000ha)	Pasture	Crops	Forest	Mining	Infra-structure	Settle-ment	Total		
Northwest Highlands	1	7344	0.061	0.000	0.000	0.190	0.008	0.001	0.259	60.57	0.17
Gulf Plains	2	21911	2.103	0.000	0.000	0.000	0.193	0.000	2.296	71.19	1.49
Cape York Peninsula	3	12305	0.396	0.000	0.000	1.394	0.242	0.002	2.034	93.18	1.32
Mitchell Grass Downs	4	24162	6.441	0.000	0.000	0.002	0.071	0.000	6.514	13.54	4.24
Channel Country	5	23217	0.096	0.000	0.000	0.000	0.027	0.000	0.123	11.04	0.08
Mulga Lands	6	18606	28.791	0.000	0.014	0.000	0.547	0.003	29.355	48.01	19.11
Wet Tropics	7	1993	0.248	0.020	1.108	0.025	0.021	0.003	1.426	83.87	0.93
Central Queensland Coast	8	1484	0.892	0.051	0.317	0.009	0.019	0.016	1.303	77.40	0.85
Einasleigh Uplands	9	11626	0.911	0.055	0.000	0.021	0.094	0.000	1.081	86.50	0.70
Desert Uplands	10	6941	7.881	0.000	0.000	0.064	0.380	0.001	8.325	64.74	5.42
Brigalow Belt	11	36528	79.598	0.182	1.623	3.897	2.143	0.258	87.702	51.00	57.08
Southeast Queensland	12	6248	4.367	0.076	3.969	0.232	0.756	1.042	10.442	70.51	6.80
New England Tableland	13	775	2.661	0.004	0.078	0.007	0.026	0.004	2.780	61.82	1.81

¹ Based on the wooded extent and FPC index V2.3

Table 11: Woody vegetation clearing by tenure by biogeographic region, showing HVR and remnant status (2011–12)

Biogeographic region				Rate of woody vegetation change (,000ha/yr) on					
Name	Map Ref.	Area (,000ha)	Remnant Status	Freehold	Leasehold	Other Tenures	Other Reserves	Total	% Remnant clearing
Northwest Highlands	1	7344	Remnant	0.004	0.234	0.000	0.000	0.238	92
			HVR	0.000	0.000	0.000	0.000	0.000	
			Non-remnant	0.001	0.021	0.000	0.000	0.021	
Gulf Plains	2	21911	Remnant	0.089	1.476	0.000	0.000	1.565	68
			HVR	0.007	0.015	0.000	0.000	0.023	
			Non-remnant	0.363	0.345	0.000	0.000	0.708	
Cape York Peninsula	3	12305	Remnant	0.087	0.294	1.389	0.052	1.822	90
			HVR	0.011	0.020	0.017	0.000	0.047	
			Non-remnant	0.039	0.013	0.112	0.000	0.165	
Mitchell Grass Downs	4	24162	Remnant	0.547	1.022	0.000	0.000	1.568	24
			HVR	0.832	0.021	0.000	0.000	0.853	
			Non-remnant	3.066	1.027	0.000	0.000	4.093	
Channel Country	5	23217	Remnant	0.000	0.103	0.000	0.000	0.103	84
			HVR	0.000	0.000	0.000	0.000	0.000	
			Non-remnant	0.000	0.020	0.000	0.000	0.020	
Mulga Lands	6	18606	Remnant	4.410	2.677	0.000	0.049	7.136	24
			HVR	2.154	0.633	0.000	0.000	2.787	
			Non-remnant	13.915	5.507	0.000	0.010	19.432	
Wet Tropics	7	1993	Remnant	0.098	0.096	0.000	0.099	0.294	21
			HVR	0.034	0.005	0.000	0.002	0.041	
			Non-remnant	0.068	0.019	0.000	1.004	1.092	
Central Queensland Coast	8	1484	Remnant	0.218	0.075	0.000	0.024	0.317	24
			HVR	0.214	0.012	0.000	0.015	0.241	
			Non-remnant	0.447	0.018	0.000	0.278	0.743	
Einasleigh Uplands	9	11626	Remnant	0.088	0.844	0.001	0.003	0.936	87
			HVR	0.005	0.010	0.000	0.000	0.014	
			Non-remnant	0.074	0.056	0.000	0.000	0.131	
Desert Uplands	10	6941	Remnant	0.412	1.991	0.000	0.004	2.407	29
			HVR	0.089	0.710	0.000	0.000	0.798	
			Non-remnant	1.039	4.080	0.000	0.000	5.119	
Brigalow Belt	11	36528	Remnant	7.409	6.844	0.003	1.169	15.425	18
			HVR	8.242	3.119	0.000	0.224	11.585	
			Non-remnant	43.893	16.620	0.000	0.178	60.691	
Southeast Queensland	12	6248	Remnant	1.660	0.334	0.000	0.158	2.153	21
			HVR	1.736	0.236	0.000	0.011	1.984	
			Non-remnant	2.433	0.273	0.001	3.598	6.305	
New England Tableland	13	775	Remnant	0.603	0.011	0.000	0.000	0.614	22
			HVR	0.334	0.007	0.000	0.000	0.341	
			Non-remnant	1.735	0.011	0.000	0.069	1.815	

5.2 Woody vegetation clearing by catchments

The clearing rates for the major drainage divisions are shown in Table 12 on this page and historically in Figure 24 (page 49). Appendix D (page 85) has a full analysis of clearing rates for each catchment, broken down by tenure and replacement cover. The maps shown in Figure 25 (page 50) and Figure 26 (page 51) show the percentage of woody vegetation cleared for each catchment.

Results

- The clearing rates for North East Coast and Murray-Darling drainage divisions were the highest, with 78 060 ha/year and 60 900 ha/year respectively. Combined, these two drainage divisions accounted for 90% of the state's clearing (Table 12, below).
- The reef catchments are a subset of the North East Coast drainage division indicated by the blue outline in Figure 25 (page 50). These catchments recorded a clearing rate of 73 720 ha/year. This is more than double the 34 550 ha/year reported in the 2010–11 era.

Table 12: Woody vegetation clearing by land cover by drainage division (2011–12)

Drainage division		Rate of woody vegetation clearing (.000ha/yr)							% wooded vegetation cover 2011 ¹	% total clearing in QLD
Name	Total area (.000ha)	Pasture	Crops	Forest	Mining	Infra-structure	Settle-ment	Total		
Bulloo	5185	0.668	0.000	0.000	0.000	0.002	0.000	0.670	29.04	0.44
Gulf Rivers	45307	3.225	0.030	0.000	1.594	0.359	0.001	5.209	72.30	3.39
Lake Eyre	51014	8.631	0.000	0.000	0.010	0.172	0.001	8.814	20.19	5.74
Murray-Darling	26253	57.427	0.164	0.642	0.767	1.869	0.023	60.893	48.31	39.63
North East Coast	45026	64.495	0.193	6.467	3.469	2.128	1.304	78.057	66.10	50.80
Reef Catchments ²	42311	63.067	0.193	4.962	3.333	1.681	0.480	73.716	73.08	47.98

¹ Based on the wooded extent and FPC index V2.3

² Reef catchments are a large component of the North East Coast drainage division, not a separate division

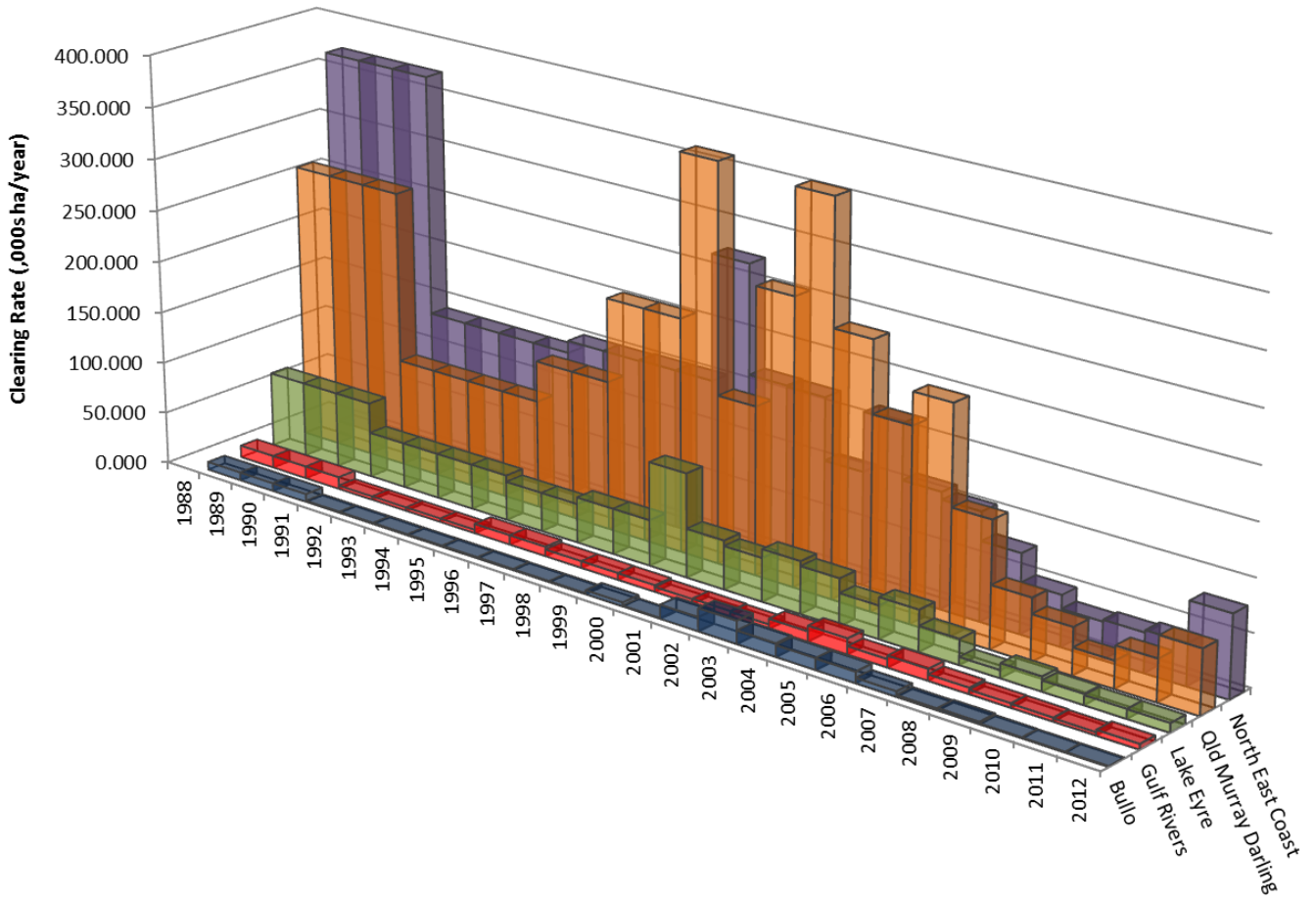
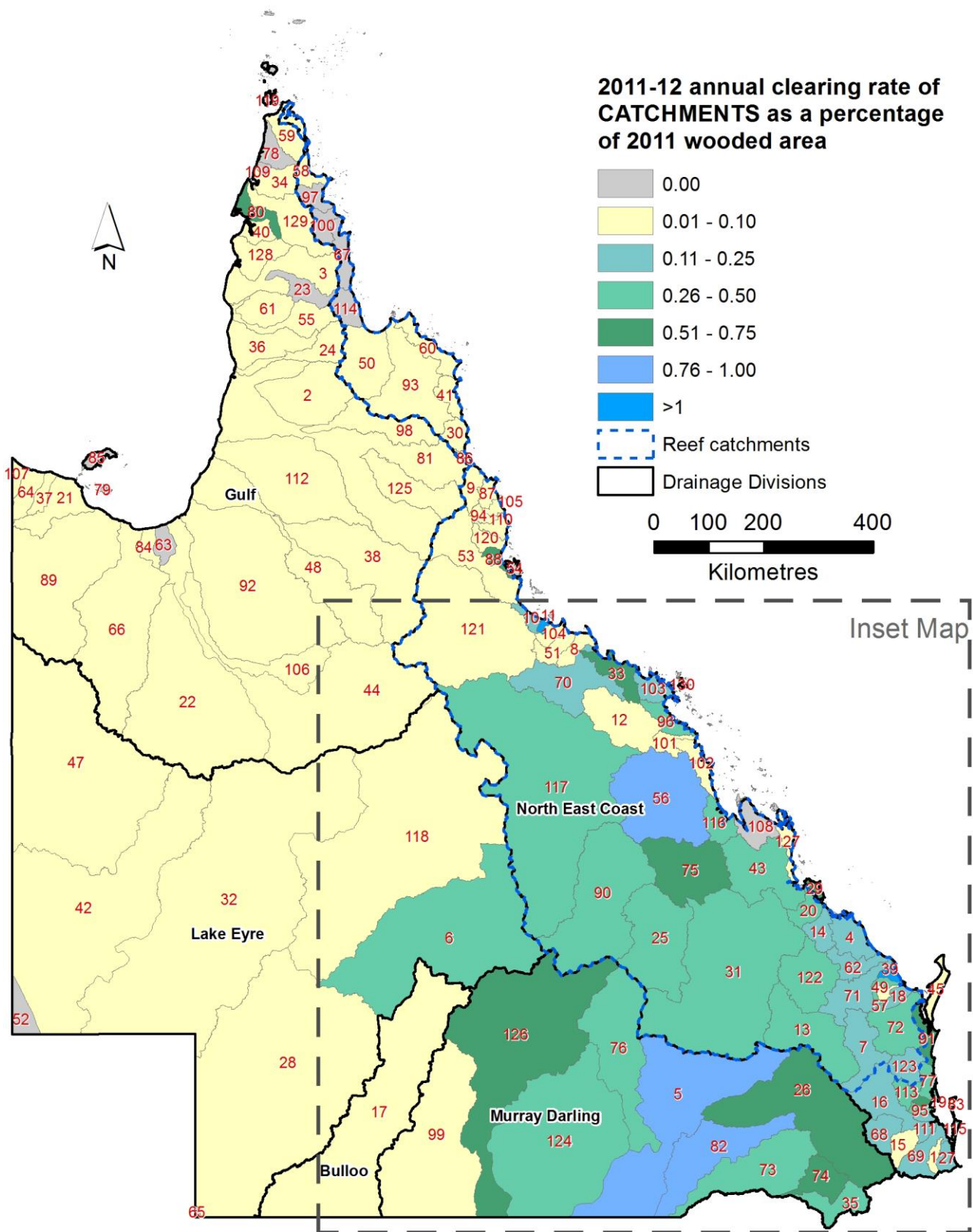
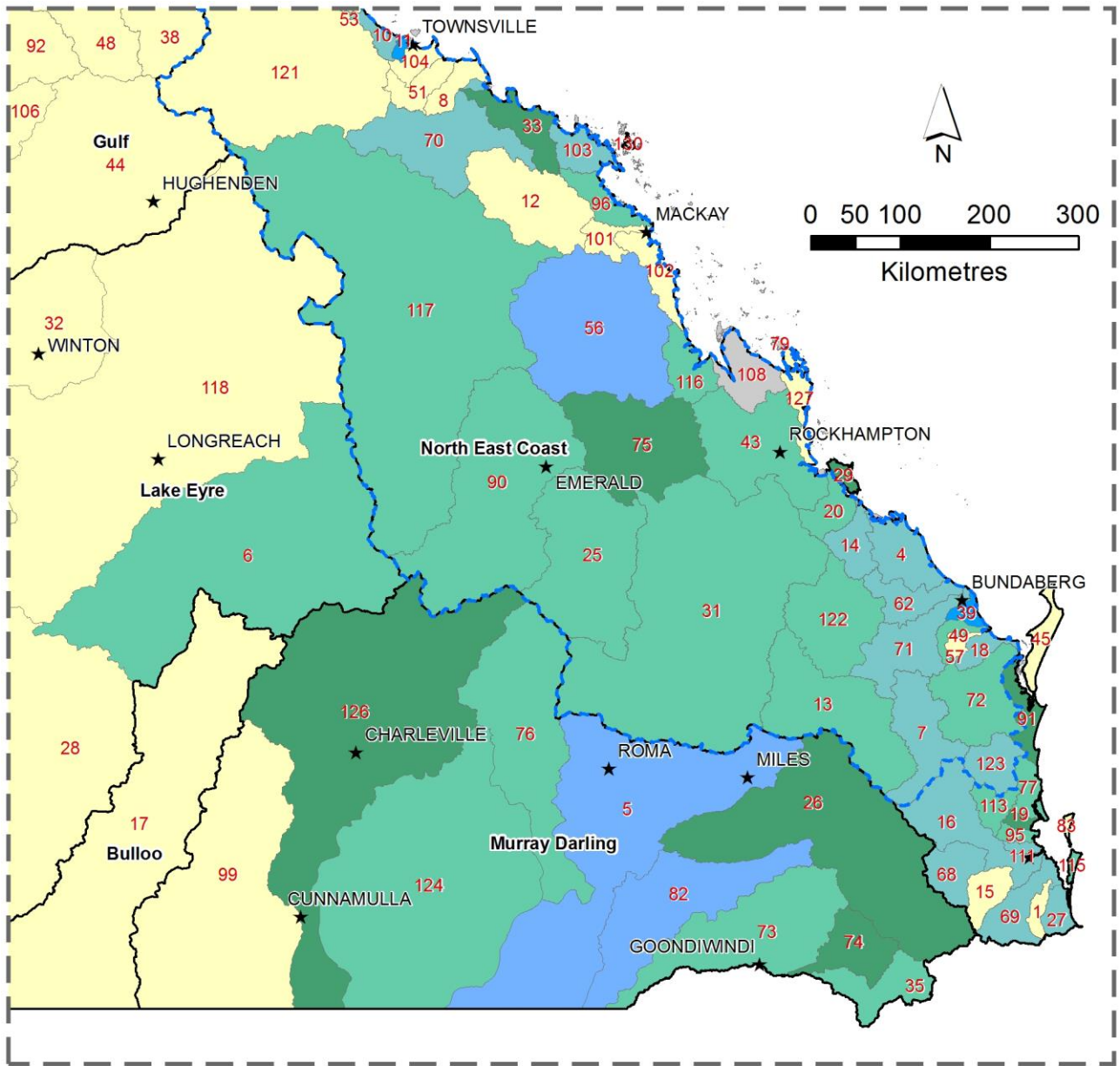


Figure 24: Trend in drainage divisions with the woody vegetation clearing rates (1988–2012)



NOTE: Numbers on the face of the map refer to the catchment reference number in the accompanying table. Colours indicate the overall coverage for catchments and do not indicate the location of specific wooded areas within them.

Figure 25: Average annual woody vegetation clearing rate as a percentage of 2011 wooded area by catchment (2011–12)



CATCHMENTS

INSET: 2011-12 annual clearing rate of CATCHMENTS as a percentage of 2011 wooded area

- Reef catchments
- Drainage division
- 0.00
- 0.01 - 0.10
- 0.11 - 0.25
- 0.26 - 0.50
- 0.51 - 0.75
- 0.76 - 1.00
- >1
- ★ Towns

NOTE: Numbers on the face of the map refer to the catchment reference number in the accompanying table.

Colours indicate the overall coverage for catchment and do not indicate the location of specific wooded areas within them.

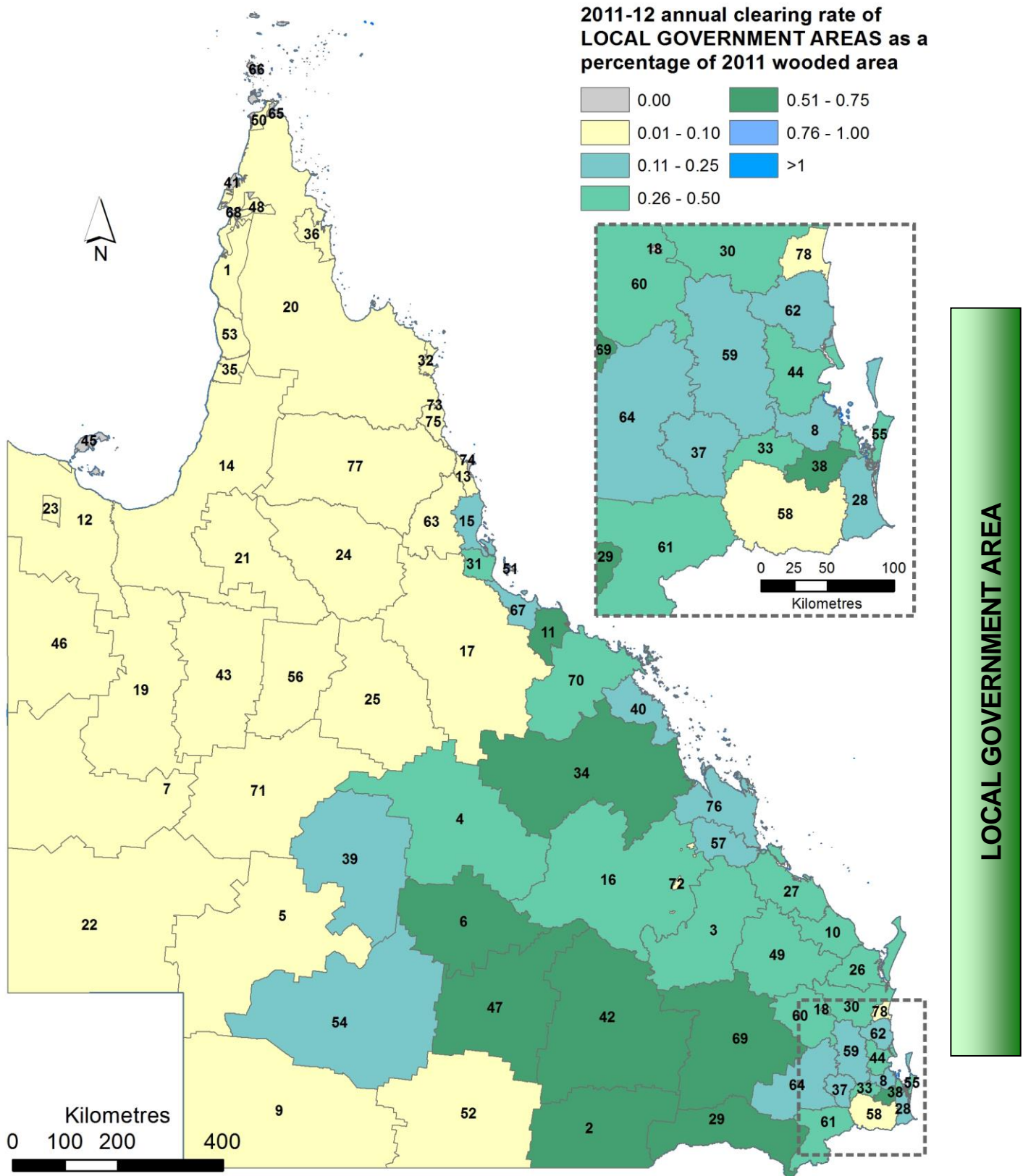
Figure 26: Average annual woody vegetation clearing rate as a percentage of 2011 wooded area by catchment (2011–12)

5.3 Woody vegetation clearing by local government area

The clearing rates for local government areas are shown in Figure 27 (page 53) as a percentage of woody vegetation cleared for each catchment. A full breakdown of clearing in local government areas can be found in Table 21 in Appendix E (on page 95).

Results

- The local government area of Isaac Regional Shire recorded the highest clearing rate of 20 550 ha/year. This is more than three times the amount identified in 2010–11.



NOTE: Numbers on the face of the map refer to the LGA reference number in the accompanying table. Colours indicate the overall coverage for LGA's and do not indicate the location of specific wooded areas within them.

Figure 27: Average annual woody vegetation clearing rate as a percentage of 2011 wooded area by local government area (2011–12)

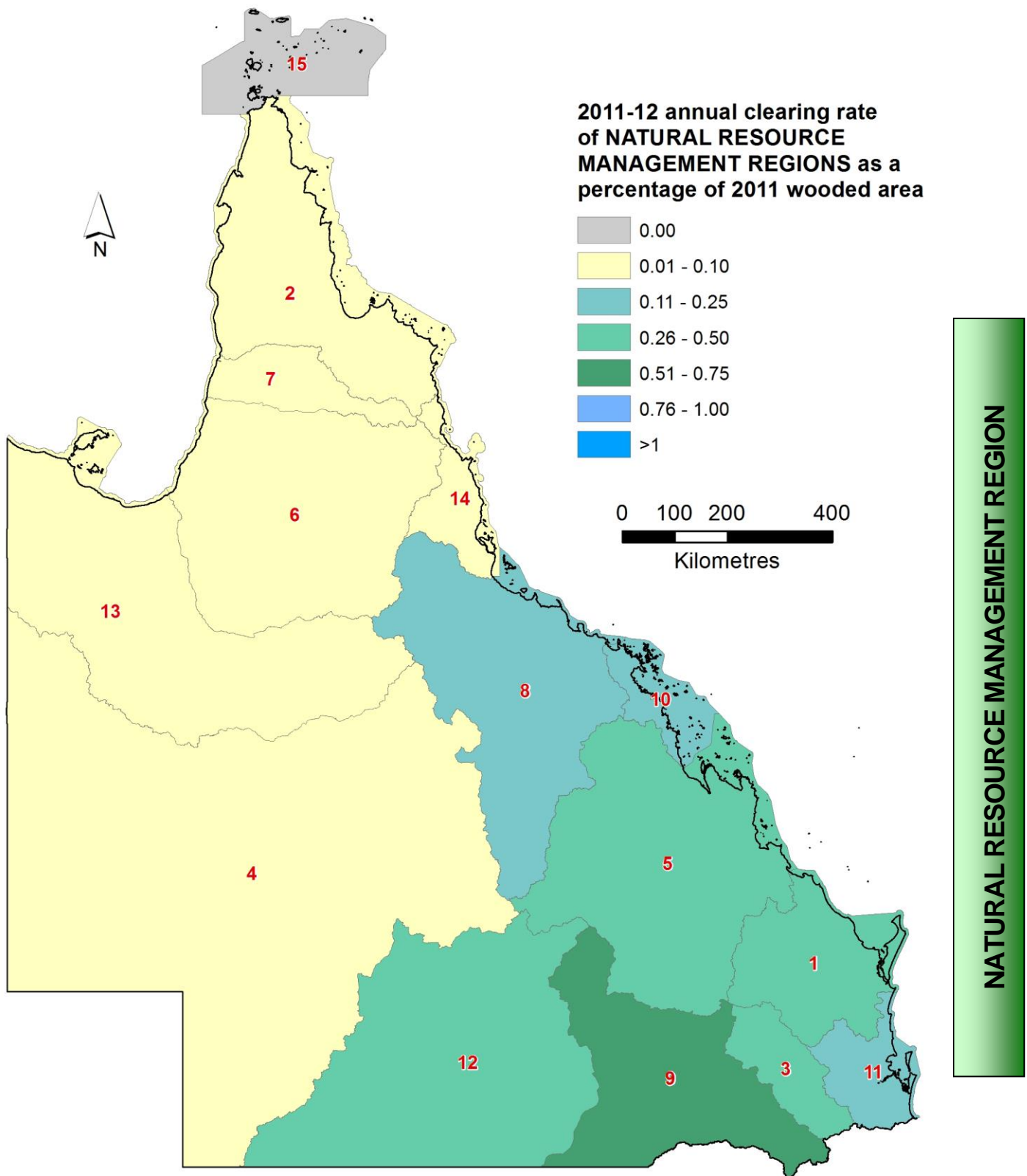
5.4 Woody vegetation clearing by Natural Resource Management region

The clearing rates for the Natural Resource Management regions (NRMR) are shown in Figure 28 (page 55) as a percentage of woody vegetation cleared for each region. A breakdown of clearing rates by replacement land cover and tenure are displayed in Tables 13 and 14 (page 56) respectively.

A more detailed analysis of clearing in each NRMR can be found in the Addenda Reports on the SLATS website <http://www.qld.gov.au/environment/land/vegetation/mapping/slats/>.

Results

- The NRMR with the highest clearing rate was Fitzroy Basin with 41 610 ha/year, representing a 171% increase from 2010–11 (Tables 13 and 14, page 56).
- The South West Queensland NRMR recorded the next highest clearing rate of 29 050 ha/year – an 80% increase from 2010–11 (Tables 13 and 14, page 56).



NOTE: Numbers on the face of the map refer to the NRMR reference number in the accompanying table. Colours indicate the overall coverage for NRMR and do not indicate the location of specific wooded areas within them.

Figure 28: Average annual woody vegetation clearing as a percentage of 2011 wooded area by Natural Resource Management region (2011–12)

Table 13: Woody vegetation clearing by land cover by Natural Resource Management region (2011-12)

NRM region			Rate of woody vegetation clearing (,000ha/yr)							% wooded vegetation cover 2011 ¹	% total clearing in QLD
Name	Ref.	Total area (,000ha)	Pasture	Crops	Forest	Mining	Infra-structure	Settle-ment	Total		
Burnett Mary	1	5595	7.712	0.076	3.637	0.090	0.203	0.076	11.794	69.175	7.671
Cape York ³	2, 7	13685	0.469	0.000	0.000	1.394	0.250	0.002	2.115	92.219	1.376
Condamine	3	2544	3.656	0.017	0.212	0.225	0.823	0.003	4.935	39.182	3.210
Desert Channels	4	51000	8.631	0.000	0.000	0.010	0.172	0.001	8.814	20.216	5.733
Fitzroy	5	15725	36.595	0.016	0.825	2.862	1.112	0.195	41.605	55.594	27.061
Northern Gulf ²	6, 7	19410	1.420	0.030	0.000	0.033	0.192	0.000	1.675	88.107	1.090
Burdekin	8	14090	17.684	0.007	0.209	0.361	0.451	0.188	18.900	64.821	12.293
Border Rivers/ Maranoa Balonne ⁴	9	10176	25.956	0.147	0.407	0.542	0.501	0.017	27.570	42.550	17.932
Mackay Whitsunday	10	934	0.751	0.051	0.122	0.003	0.019	0.016	0.961	67.706	0.625
South East Queensland	11	2368	1.403	0.000	0.566	0.136	0.189	0.825	3.120	66.740	2.029
South West Queensland	12	18711	28.483	0.000	0.024	0.000	0.541	0.003	29.051	47.334	18.895
Southern Gulf	13	19460	1.547	0.000	0.000	0.181	0.073	0.001	1.801	49.179	1.171
Wet Tropics	14	2224	0.238	0.044	1.108	0.002	0.010	0.003	1.406	84.337	0.914
Torres Strait	15	85	0.000	0.000	0.000	0.000	0.000	0.000	0.000	70.113	0.000

¹ Based on the wooded extent and FPC index V2.3

² Statistics for entire region, including overlap with Northern Gulf region

³ Statistics for entire region, including overlap with Cape York region

⁴ Queensland Murray–Darling Committee manages Border Rivers and Maranoa–Balonne regions

Table 14: Woody vegetation clearing by tenure by Natural Resource Management region (2011–12)

NRM region			Rate of woody vegetation clearing (,000ha/yr)					% wooded vegetation cover 2011 ¹	% total clearing in QLD
Name	Ref.	Total area (,000ha)	Freehold	Leasehold	Other	Reserves	Total		
Burnett Mary	1	5595	7.258	1.173	0.000	3.364	11.794	69.18	7.67
Cape York ³	2, 7	13685	0.142	0.399	1.518	0.057	2.115	92.22	1.38
Condamine	3	2544	4.504	0.146	0.000	0.285	4.935	39.18	3.21
Desert Channels	4	51000	4.092	4.721	0.000	0.001	8.814	20.22	5.73
Fitzroy	5	15725	30.010	10.800	0.001	0.794	41.605	55.59	27.06
Northern Gulf ²	6, 7	19410	0.090	1.583	0.000	0.003	1.675	88.11	1.09
Burdekin	8	14090	4.155	14.526	0.001	0.217	18.900	64.82	12.29
Border Rivers/ Maranoa Balonne ⁴	9	10176	24.369	2.788	0.003	0.411	27.570	42.55	17.93
Mackay Whitsunday	10	934	0.781	0.058	0.000	0.122	0.960	67.71	0.62
South East Queensland	11	2368	2.203	0.380	0.000	0.537	3.120	66.74	2.03
South West Queensland	12	18711	17.940	11.039	0.000	0.071	29.051	47.33	18.90
Southern Gulf	13	19460	0.603	1.198	0.000	0.000	1.801	49.18	1.17
Wet Tropics	14	2224	0.213	0.092	0.000	1.101	1.406	84.34	0.91
Torres Strait	15	85	0.000	0.000	0.000	0.000	0.000	70.11	0.00

¹ Based on the wooded extent and FPC index V2.3

² Statistics for entire region, including overlap with Northern Gulf region

³ Statistics for entire region, including overlap with Cape York region

⁴ Queensland Murray–Darling Committee manages Border Rivers and Maranoa–Balonne regions

5.5 Woody vegetation clearing by native pasture community

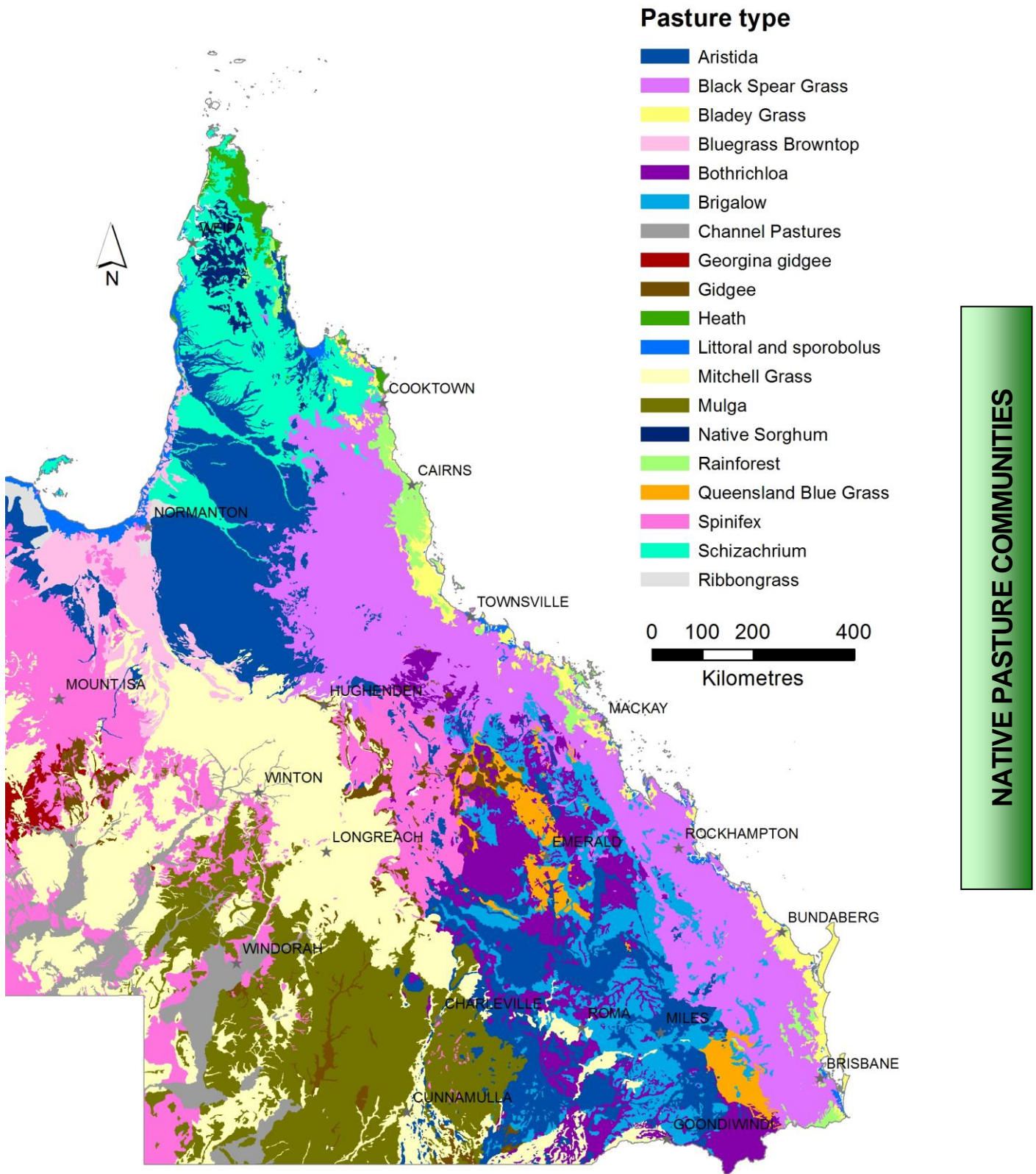


Figure 29: Queensland native pasture communities (Weston et al., 1981)

Table 15: Woody vegetation clearing by land cover by native pasture community (2011–12)

Native pasture community		Rate of woody vegetation clearing (,000ha/yr)							% wooded vegetation cover 2011 ¹	% total clearing in QLD
Name	Total area (,000ha)	Pasture	Crops	Forest	Mining	Infra-structure	Settle-ment	Total		
Aristida-Chrysopogon (tea tree)	9215	1.059	0.000	0.000	0.000	0.178	0.000	1.237	87.79	0.81
Aristida-Chrysopogon (W. Einasleigh)	2535	0.060	0.000	0.000	0.000	0.052	0.000	0.112	89.51	0.07
Aristida-Cleistochloa (sandstone hills)	3627	5.666	0.000	0.058	0.220	0.280	0.000	6.223	85.10	4.05
Aristida-Eragrostis (cypress pine)	1074	1.473	0.000	0.189	0.009	0.057	0.002	1.729	76.20	1.13
Aristida-Eragrostis (southern sandstone)	1726	4.877	0.000	0.387	0.703	1.116	0.012	7.096	75.17	4.62
Aristida-Thyridolepis (poplar box)	2585	11.992	0.000	0.013	0.000	0.024	0.000	12.030	49.49	7.84
Aristida-Triodia (lancewood)	2425	0.362	0.000	0.000	0.000	0.008	0.000	0.370	91.09	0.24
Black Spear Grass (central)	5935	8.796	0.005	0.454	0.839	0.441	0.182	10.718	67.42	6.98
Black Spear Grass (northern)	13175	2.470	0.055	0.000	0.091	0.112	0.181	2.909	84.97	1.90
Black Spear Grass (southern)	6052	7.490	0.008	2.053	0.111	0.230	0.702	10.594	68.45	6.90
Bladey Grass (central)	578	0.345	0.056	0.122	0.003	0.010	0.005	0.541	48.12	0.35
Bladey Grass (northern)	1029	0.119	0.008	1.049	0.004	0.042	0.011	1.234	72.28	0.80
Bladey Grass (southern)	987	0.795	0.058	1.862	0.094	0.055	0.147	3.012	78.58	1.96
Bluegrass Browntop	4775	0.431	0.000	0.000	0.000	0.009	0.000	0.440	36.46	0.29
Bothriochloa-Chloris (central)	4514	13.255	0.000	0.106	1.138	0.163	0.012	14.673	55.50	9.56
Bothriochloa-Chloris (south)	5286	16.934	0.122	0.337	0.029	0.200	0.004	17.626	50.49	11.48
Bothriochloa-Danthonia (traprock)	328	0.940	0.000	0.005	0.001	0.022	0.000	0.968	58.97	0.63
Brigalow (northern)	3918	13.917	0.004	0.143	0.621	0.031	0.007	14.723	34.50	9.59
Brigalow (Roma region)	1622	2.815	0.010	0.041	0.220	0.059	0.000	3.144	30.69	2.05
Brigalow and Belah (southern)	3226	5.407	0.040	0.042	0.029	0.067	0.002	5.588	22.10	3.64
Channel Pastures	5534	0.009	0.000	0.000	0.000	0.013	0.000	0.022	10.53	0.01
Georgina gidgee	1637	0.001	0.000	0.000	0.000	0.000	0.000	0.001	10.84	0.00
Gidgee (central)	1317	2.019	0.000	0.000	0.002	0.009	0.000	2.030	36.41	1.32
Gidgee (far west)	611	0.001	0.000	0.000	0.001	0.000	0.000	0.002	17.21	0.00
Gidgee (southern)	772	0.103	0.000	0.000	0.000	0.010	0.000	0.113	41.34	0.07
Heath	942	0.004	0.000	0.000	0.012	0.002	0.000	0.018	94.73	0.01
Littoral and sporobolus	1488	1.040	0.002	0.000	0.000	0.139	0.028	1.209	39.52	0.79
Mitchell Grass (Ashy Downs)	2556	0.074	0.000	0.000	0.000	0.011	0.000	0.084	5.93	0.05
Mitchell Grass (Northern Downs)	21962	4.227	0.000	0.000	0.000	0.064	0.000	4.291	11.75	2.80
Mitchell Grass (Southern Downs)	2552	1.788	0.000	0.000	0.000	0.028	0.001	1.817	29.02	1.18
Mitchell Grass (Southern Flooded)	875	0.245	0.002	0.000	0.000	0.017	0.000	0.263	26.57	0.17
Mitchell Grass (Stony Downs)	2144	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.21	0.00
Mulga on residuals	8023	0.783	0.000	0.000	0.000	0.025	0.000	0.808	29.38	0.53

¹ Based on the wooded extent and FPC index V2.3

Table 15 (continued): Woody vegetation clearing by land cover by native pasture community (2011–12)

Native pasture community		Rate of woody vegetation clearing (,000ha/yr)							% wooded vegetation cover 2011 ¹	% total clearing in QLD
Name	Total area (,000ha)	Pasture	Crops	Forest	Mining	Infra-structure	Settle-ment	Total		
Mulga-Whitewood	637	0.000	0.000	0.000	0.000	0.001	0.000	0.001	20.35	0.00
Native Sorghum	1013	0.009	0.000	0.000	0.003	0.005	0.000	0.017	95.89	0.01
Queensland Blue Grass (central)	1574	2.218	0.000	0.000	0.071	0.006	0.000	2.294	35.67	1.49
Queensland Blue Grass (southern)	940	0.224	0.000	0.000	0.006	0.001	0.000	0.231	14.12	0.15
Rainforest	1849	0.317	0.018	0.248	0.001	0.010	0.024	0.618	88.80	0.40
Ribbon Grass	847	0.012	0.000	0.000	0.000	0.000	0.000	0.012	95.26	0.01
Schizachrium (flooded plains)	1782	0.075	0.000	0.000	0.000	0.001	0.000	0.076	73.27	0.05
Schizachrium (hills and plains)	7575	0.330	0.000	0.000	1.364	0.161	0.001	1.857	96.31	1.21
Soft and hard mulga on red plain	10119	16.371	0.000	0.000	0.000	0.428	0.002	16.801	52.02	10.95
Spinifex (CQ desert)	4743	4.770	0.000	0.000	0.062	0.343	0.001	5.175	66.49	3.37
Spinifex (hard on sand dunes)	5458	0.086	0.000	0.000	0.000	0.018	0.000	0.104	6.29	0.07
Spinifex (hard with eucalypts and acacia)	1987	0.218	0.000	0.000	0.000	0.008	0.000	0.226	35.26	0.15
Spinifex (Mt Isa highlands)	8895	0.249	0.000	0.000	0.191	0.009	0.001	0.450	59.37	0.29

¹ Based on the wooded extent and FPC index V2.3

Section 6 SLATS products

Information on SLATS derived products such as land cover change, wooded extent and FPC spatial data can be downloaded through the QGIS website <http://dds.information.qld.gov.au/dds/>.

Landsat imagery is also free to download from the USGS website <http://glovis.usgs.gov/>.

More information can be found on the SLATS website at <http://www.qld.gov.au/environment/land/vegetation/mapping/slats/>.

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Appendix A Woody vegetation clearing by 7'30" grid maps (1988–2012)

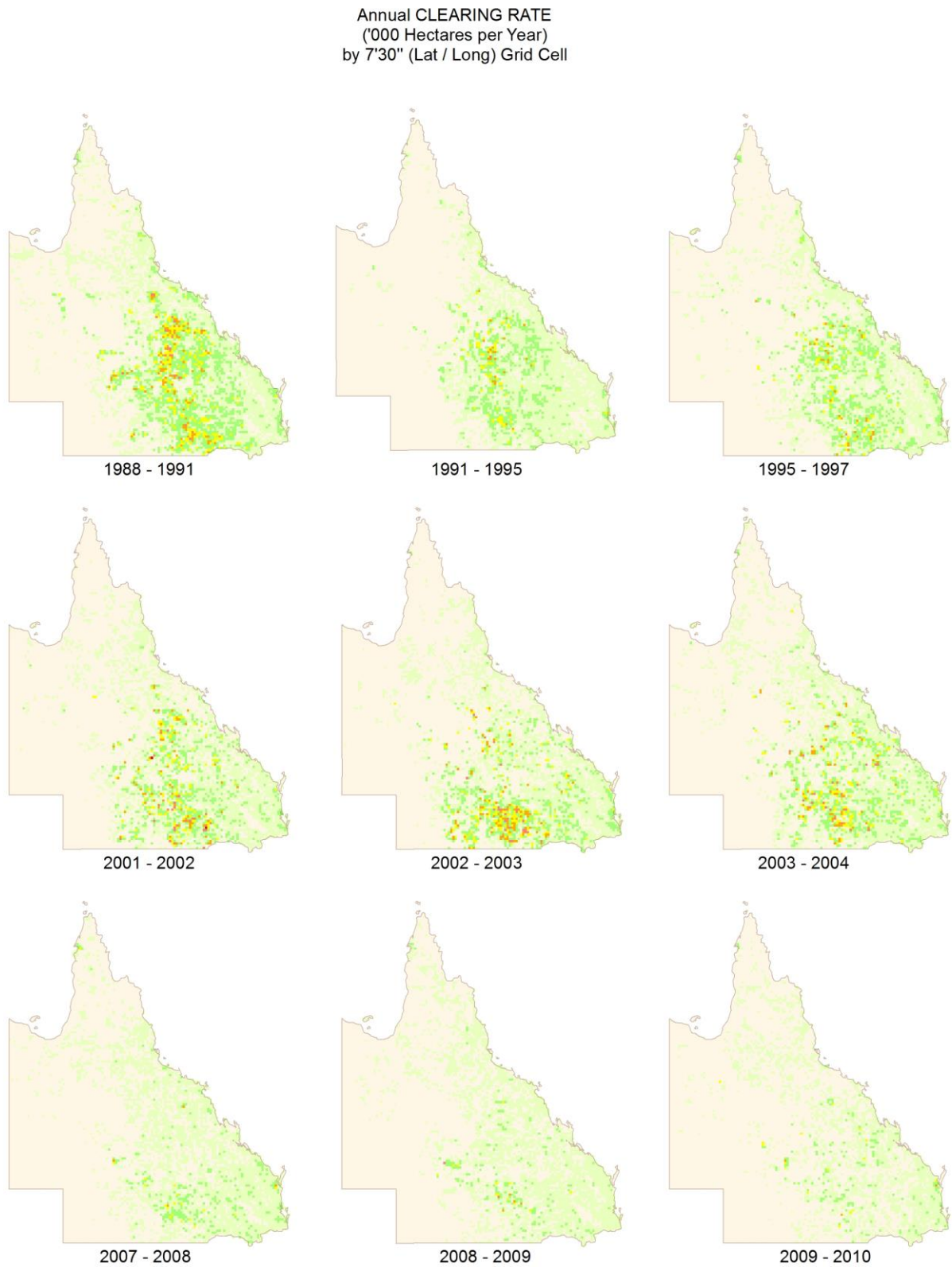


Figure 30: Average annual woody vegetation clearing rate for each of the SLATS change periods (1988–2012) by 7'30" Grid Cells

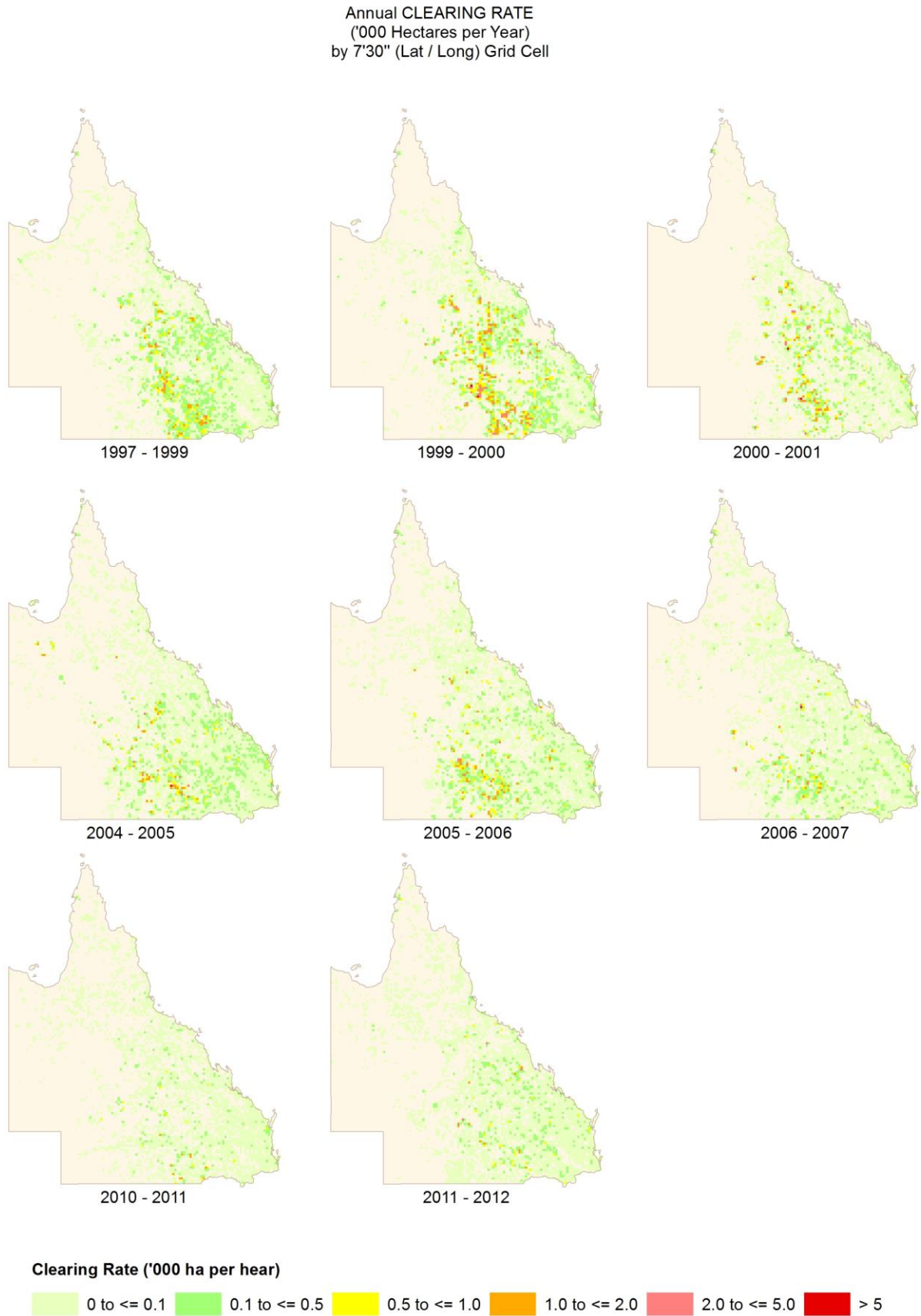


Figure 31: Average annual woody vegetation clearing rate for each of the SLATS change periods (1988–2012) by 7’30" Grid Cells

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Appendix B Woody vegetation clearing by Carnahan class analysis (1988–2012)

Table 16: Woody vegetation clearing by Carnahan class (1988–2012)

Carnahan vegetation class	Description	Clearing 1988–91		Clearing 1991–95		Clearing 1995–97	
		Rate (,000ha /yr)	% of State clearing total	Rate (,000ha /yr)	% of State clearing total	Rate (,000ha /yr)	% of State clearing total
M1	Medium trees (10–30 m) <10% foliage cover	199.96	27.5	68.42	23.74	102.86	30.09
M2	Medium trees (10–30 m) 10–30% foliage cover	228.83	31.47	82.86	28.75	109.22	31.95
M3	Medium trees (10–30 m) 30–70% foliage cover	44.7	6.15	25.02	8.68	23.38	6.84
M4	Medium trees (10–30 m) >70% foliage cover	0.96	0.13	0.79	0.27	0.69	0.2
L1	Low trees (<10 m) <10% foliage cover	69.23	9.52	33.93	11.77	19.28	5.64
L2	Low trees (<10 m) 10–30% foliage cover	50.64	6.96	33.92	11.77	25.57	7.48
L3	Low trees (<10 m) 30–70% foliage cover	3.36	0.46	0.92	0.32	1	0.29
L4	Low trees (<10 m) >70% foliage cover	0.02	0	0.03	0.01	0.02	0.01
S1	Tall shrubs (>2 m) <10% foliage cover	1.46	0.2	0.84	0.29	1.29	0.38
S2	Tall shrubs (>2 m) 10–30% foliage cover	0.48	0.07	0.48	0.17	0.28	0.08
Z1	Low shrubs (<2 m) <10% foliage cover	1.16	0.16	0.07	0.02	0.03	0.01
Z3	Low shrubs (<2 m) 30–70% foliage cover	0.04	0.01	0	0	0	0
F3	Other herbaceous plants 30–70% foliage cover	0	0	0.04	0.01	0.05	0.01
F4	Other herbaceous plants >70% foliage cover	3.41	0.47	1.39	0.48	3.79	1.11
G2	Tussocky or tufted grasses 10–30% foliage cover	18.11	2.49	4.09	1.42	7.67	2.24
G3	Tussocky or tufted grasses 30–70% foliage cover	102.2	14.06	33.36	11.58	44.51	13.02
G4	Tussocky or tufted grasses 70% foliage cover	2.6	0.36	2.02	0.7	2.08	0.61
H2	Hummock grasses 10–30% foliage cover	0	0	0	0	0	0
Total		727.16	100.00	288.18	100.00	341.72	100.00

Table 16 (continued): Woody vegetation clearing by Carnahan class (1988–2012)

Carnahan vegetation class	Description	Clearing 1997–99		Clearing 1999–2001		Clearing 2001–03	
		Rate (,000ha /yr)	% of State clearing total	Rate (,000ha /yr)	% of State clearing total	Rate (,000ha /yr)	% of State clearing total
M1	Medium trees (10–30 m) <10% foliage cover	129.05	30.28	156.25	27.24	131.04	24.9
M2	Medium trees (10–30 m) 10–30% foliage cover	139.41	32.72	183.74	32.03	153.85	29.24
M3	Medium trees (10–30 m) 30–70% foliage cover	27.99	6.57	28.45	4.96	38.19	7.26
M4	Medium trees (10–30 m) >70% foliage cover	0.48	0.11	0.66	0.12	0.49	0.09
L1	Low trees (<10 m) <10% foliage cover	25.15	5.9	65.63	11.44	74.57	14.17
L2	Low trees (<10 m) 10–30% foliage cover	42.26	9.92	69.95	12.19	57.83	10.99
L3	Low trees (<10 m) 30–70% foliage cover	0.66	0.15	1.19	0.21	0.68	0.13
L4	Low trees (<10 m) >70% foliage cover	0.03	0.01	0.05	0.01	0.08	0.01
S1	Tall shrubs (>2 m) <10% foliage cover	1.47	0.34	2.64	0.46	23.22	4.41
S2	Tall shrubs (>2 m) 10–30% foliage cover	0.38	0.09	0.17	0.03	1.15	0.22
Z1	Low shrubs (<2 m) <10% foliage cover	0	0	0.01	0	0.51	0.1
Z3	Low shrubs (<2 m) 30–70% foliage cover	0.03	0.01	0	0	0.01	0
F3	Other herbaceous plants 30–70% foliage cover	0.02	0	0	0	0	0
F4	Other herbaceous plants >70% foliage cover	2.91	0.68	3.41	0.59	3.01	0.57
G2	Tussocky or tufted grasses 10–30% foliage cover	4.75	1.11	11.19	1.95	7.93	1.51
G3	Tussocky or tufted grasses 30–70% foliage cover	49.82	11.69	48.58	8.47	32.49	6.17
G4	Tussocky or tufted grasses 70% foliage cover	1.71	0.4	1.73	0.3	1.18	0.22
H2	Hummock grasses 10–30% foliage cover	0	0	0.01	0	0	0
Total		426.12	100.00	573.67	100.00	526.23	100.00

Table 16 (continued): Woody vegetation clearing by Carnahan class (1988–2012)

Carnahan vegetation class	Description	Clearing 2003–04		Clearing 2004–05		Clearing 2005–06	
		Rate (,000ha /yr)	% of State clearing total	Rate (,000ha /yr)	% of State clearing total	Rate (,000ha /yr)	% of State clearing total)
M1	Medium trees (10–30 m) <10% foliage cover	101.49	21.18	84.85	24.35	87.5	23.48
M2	Medium trees (10–30 m) 10–30% foliage cover	152.58	31.84	96.5	27.69	91.58	24.57
M3	Medium trees (10–30 m) 30–70% foliage cover	44.73	9.33	21.78	6.25	20.61	5.53
M4	Medium trees (10–30 m) >70% foliage cover	0.6	0.13	0.32	0.09	0.67	0.18
L1	Low trees (<10 m) <10% foliage cover	61.77	12.89	57.58	16.52	72.68	19.5
L2	Low trees (<10 m) 10–30% foliage cover	56.47	11.78	35.74	10.26	57.28	15.37
L3	Low trees (<10 m) 30–70% foliage cover	0.81	0.17	0.57	0.16	1.35	0.36
L4	Low trees (<10 m) >70% foliage cover	0.6	0.12	0.47	0.14	0.15	0.04
S1	Tall shrubs (>2 m) <10% foliage cover	5.95	1.24	7.75	2.22	8.63	2.31
S2	Tall shrubs(>2 m) 10–30% foliage cover	1.41	0.29	0.4	0.12	0.34	0.09
Z1	Low shrubs (<2 m) <10% foliage cover	0.02	0	0.2	0.06	0.05	0.01
Z3	Low shrubs (<2 m) 30–70% foliage cover	0.03	0.01	0.14	0.04	0	0
F3	Other herbaceous plants 30–70% foliage cover	0	0	0	0	0	0
F4	Other herbaceous plants >70% foliage cover	3.2	0.67	3.74	1.07	3.16	0.85
G2	Tussocky or tufted grasses 10–30% foliage cover	13.71	2.86	8.34	2.39	8.23	2.21
G3	Tussocky or tufted grasses 30–70% foliage cover	33.97	7.09	28.34	8.13	17.81	4.78
G4	Tussocky or tufted grasses 70% foliage cover	1.88	0.39	1.77	0.51	2.66	0.71
H2	Hummock grasses 10–30% foliage cover	0	0	0	0	0.01	0
Total		479.21	100.00	348.49	100.00	372.71	100.00

Table 16 (continued): Woody vegetation clearing by Carnahan class (1988–2012)

Carnahan vegetation class	Description	Clearing 2006–07		Clearing 2007–08		Clearing 2008–09	
		Rate (,000ha /yr)	% of State clearing total	Rate (,000ha /yr)	% of State clearing total	Rate (,000ha /yr)	% of State clearing total
M1	Medium trees (10–30 m) <10% foliage cover	50.49	21.66	29.5	24.33	22.87	23.19
M2	Medium trees (10–30 m) 10–30% foliage cover	74.32	31.89	38.76	31.97	28.09	28.47
M3	Medium trees (10–30 m) 30–70% foliage cover	17.77	7.62	17.14	14.14	8.23	8.34
M4	Medium trees (10–30 m) >70% foliage cover	0.57	0.24	0.66	0.54	0.41	0.41
L1	Low trees (<10 m) <10% foliage cover	42.59	18.27	13.7	11.3	15.43	15.64
L2	Low trees (<10 m) 10–30% foliage cover	20.31	8.71	7.92	6.53	7.08	7.17
L3	Low trees (<10 m) 30–70% foliage cover	1.72	0.74	0.09	0.08	0.78	0.79
L4	Low trees (<10 m) >70% foliage cover	0.01	0.01	0.01	0.01	0.12	0.13
S1	Tall shrubs (>2 m) <10% foliage cover	5.83	2.5	0.85	0.7	1.76	1.79
S2	Tall shrubs (>2 m) 10–30% foliage cover	1.26	0.54	0.6	0.5	0.78	0.79
Z1	Low shrubs (<2 m) <10% foliage cover	0.09	0.04	0.02	0.02	0	0
Z3	Low shrubs (<2 m) 30–70% foliage cover	0.07	0.03	0	0	0.02	0.02
F3	Other herbaceous plants 30–70% foliage cover	0	0	0	0	0	0
F4	Other herbaceous plants >70% foliage cover	2.21	0.95	2.57	2.12	1.83	1.85
G2	Tussocky or tufted grasses 10–30% foliage cover	1.34	0.58	1.71	1.41	2.98	3.02
G3	Tussocky or tufted grasses 30–70% foliage cover	13.31	5.71	6.83	5.64	7.69	7.8
G4	Tussocky or tufted grasses 70% foliage cover	1.15	0.5	0.87	0.72	0.58	0.58
H2	Hummock grasses 10–30% foliage cover	0.02	0.01	0	0	0	0
Total		233.06	100.00	121.24	100.00	98.66	100.00

Table 16 (continued): Woody vegetation clearing by Carnahan class (1988–2012)

Carnahan vegetation class	Description	Clearing 2009–10		Clearing 2010–11		Clearing 2011–12	
		Rate (,000ha /yr)	% of State clearing total	Rate (,000ha /yr)	% of State clearing total	Rate (,000ha /yr)	% of State clearing total
M1	Medium trees (10–30 m) <10% foliage cover	19.68	25.61	27.87	30.73	35.42	23.29
M2	Medium trees (10–30 m) 10–30% foliage cover	18.27	23.78	25.43	28.04	49.48	32.54
M3	Medium trees (10–30 m) 30–70% foliage cover	8.06	10.49	6.35	7.00	10.19	6.70
M4	Medium trees (10–30 m) >70% foliage cover	0.4	0.53	0.78	0.86	0.63	0.42
L1	Low trees (<10 m) <10% foliage cover	8.71	11.34	9.17	10.11	13.07	8.60
L2	Low trees (<10 m) 10–30% foliage cover	6.97	9.08	7.84	8.64	11.80	7.76
L3	Low trees (<10 m) 30–70% foliage cover	0.17	0.22	0.16	0.18	0.09	0.06
L4	Low trees (<10 m) >70% foliage cover	0.03	0.04	0.03	0.04	0.02	0.01
S1	Tall shrubs (>2 m) <10% foliage cover	0.30	0.40	1.06	1.17	0.77	0.50
S2	Tall shrubs (>2 m) 10–30% foliage cover	0.26	0.34	0.32	0.36	0.01	0.01
Z1	Low shrubs (<2 m) <10% foliage cover	0.02	0.02	0.02	0.02	0.00	0.00
Z3	Low shrubs (<2 m) 30–70% foliage cover	0.01	0.01	0.03	0.03	0.01	0.01
F3	Other herbaceous plants 30–70% foliage cover	0.00	0.00	0.00	0.00	0.00	0.00
F4	Other herbaceous plants >70% foliage cover	1.14	1.49	0.95	1.05	1.87	1.23
G2	Tussocky or tufted grasses 10–30% foliage cover	3.20	4.17	1.08	1.19	2.06	1.35
G3	Tussocky or tufted grasses 30–70% foliage cover	9.32	12.13	9.15	10.09	25.85	17.00
G4	Tussocky or tufted grasses 70% foliage cover	0.29	0.37	0.45	0.50	0.78	0.51
H2	Hummock grasses 10–30% foliage cover	0.00	0.00	0.00	0.00	0.00	0.00
Total		76.83	100.00	90.70	100.00	152.06	100.00

Appendix C Woody vegetation clearing by biogeographic sub-region (2011–12)

Table 17: Woody vegetation clearing by land cover by biogeographic sub-region (2011–12)

Biogeographic sub-region ²			Rate of woody vegetation clearing (,000ha/yr)							% wooded vegetation cover 2011 ¹	% total clearing in Qld
Name	Ref. No.	Total area (,000ha)	Pasture	Crops	Forest	Mining	Infra-structure	Settle-ment	Total		
Southwestern Plateaus and Floodouts	1.1	1334	0.009	0.000	0.000	0.000	0.000	0.000	0.009	61.57	0.01
Thorntonia	1.2	779	0.000	0.000	0.000	0.000	0.000	0.000	0.000	48.22	0.00
Mount Isa Inlier	1.3	4642	0.052	0.000	0.000	0.190	0.008	0.001	0.250	59.35	0.16
McArthur	1.4	589	0.001	0.000	0.000	0.000	0.000	0.000	0.001	84.24	0.00
Karumba Plains	2.1	1071	0.000	0.000	0.000	0.000	0.000	0.000	0.000	36.88	0.00
Armraynald Plains	2.2	1589	0.045	0.000	0.000	0.000	0.000	0.000	0.045	46.29	0.03
Woondoola Plains	2.3	2375	0.179	0.000	0.000	0.000	0.004	0.000	0.183	28.41	0.12
Mitchell - Gilbert Fans	2.4	5263	0.555	0.000	0.000	0.000	0.014	0.000	0.569	87.23	0.37
Claraville Plains	2.5	3738	0.529	0.000	0.000	0.000	0.128	0.000	0.657	80.05	0.43
Holroyd Plain - Red Plateau	2.6	2208	0.116	0.000	0.000	0.000	0.015	0.000	0.131	92.26	0.09
Doomadgee Plains	2.7	1685	0.062	0.000	0.000	0.000	0.001	0.000	0.063	91.47	0.04
Donors Plateau	2.8	2450	0.592	0.000	0.000	0.000	0.005	0.000	0.597	48.58	0.39
Gilberton Plateau	2.9	1404	0.025	0.000	0.000	0.000	0.026	0.000	0.051	95.08	0.03
Wellesley Islands	2.10	128	0.000	0.000	0.000	0.000	0.000	0.000	0.000	83.54	0.00
Coen - Yambo Inlier	3.1	2313	0.045	0.000	0.000	0.000	0.028	0.000	0.072	97.30	0.05
Starke Coastal Lowlands	3.2	514	0.071	0.000	0.000	0.012	0.053	0.002	0.139	94.00	0.09
Cape York - Torres Strait	3.3	102	0.000	0.000	0.000	0.000	0.000	0.000	0.000	66.60	0.00
Jardine - Pascoe Sandstones	3.4	1451	0.001	0.000	0.000	0.000	0.014	0.000	0.015	96.91	0.01
Battle Camp Sandstones	3.5	505	0.000	0.000	0.000	0.000	0.001	0.000	0.001	99.39	0.00
Laura Lowlands	3.6	1792	0.042	0.000	0.000	0.002	0.084	0.000	0.128	92.85	0.08
Weipa Plateau	3.7	2876	0.175	0.000	0.000	1.380	0.057	0.000	1.612	95.22	1.05
Northern Holroyd Plain	3.8	2464	0.052	0.000	0.000	0.000	0.002	0.000	0.054	89.57	0.04
Coastal Plains	3.9	289	0.009	0.000	0.000	0.000	0.003	0.000	0.012	50.86	0.01
Georgina Limestone	4.1	1438	0.001	0.000	0.000	0.000	0.002	0.000	0.002	12.27	0.00
Southwestern Downs	4.2	3715	0.017	0.000	0.000	0.002	0.000	0.000	0.019	6.51	0.01
Kynuna Plateau	4.3	2293	0.005	0.000	0.000	0.000	0.000	0.000	0.005	28.02	0.00
Southern Wooded Downs	4.4	4721	5.477	0.000	0.000	0.000	0.014	0.000	5.491	30.56	3.57
Central Downs	4.5	9379	0.780	0.000	0.000	0.000	0.044	0.000	0.824	5.50	0.54
Flinders	4.6	435	0.161	0.000	0.000	0.000	0.011	0.000	0.172	29.79	0.11
Barkly Tableland	4.7	2181	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.57	0.00

¹ Based on the wooded extent and FPC index V2.3

² Analysis against version 5.0 of the biogeographic sub-region dataset resulted in a change in some names and reference numbers relative to previous SLATS reports. Refer to companion spreadsheet for full details on how the new sub-regions relate to previous SLATS reports.

Table 17 (cont.): Woody vegetation clearing by land cover by biogeographic sub-region (2011–12)

Biogeographic sub-region ²			Rate of woody vegetation clearing (.000ha/yr)							% wooded vegetation cover 2011 ¹	% total clearing in QLD
Name	Ref. No.	Total area (.000ha)	Pasture	Crops	Forest	Mining	Infra-structure	Settle-ment	Total		
Toko Plains	5.1	498	0.000	0.000	0.000	0.000	0.000	0.000	0.000	14.41	0.00
Sturt Stony Desert	5.2	5774	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.71	0.00
Georgina - Eyre Plains	5.3	1213	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.48	0.00
Goneaway Tablelands	5.4	5182	0.068	0.000	0.000	0.000	0.023	0.000	0.091	26.07	0.06
Cooper - Diamantina Plains	5.5	3438	0.027	0.000	0.000	0.000	0.003	0.000	0.031	10.51	0.02
Noccurrundra Slopes	5.6	1799	0.000	0.000	0.000	0.000	0.000	0.000	0.000	13.60	0.00
Lake Pure	5.7	985	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.06	0.00
Bulloo Dunefields	5.8	1077	0.001	0.000	0.000	0.000	0.001	0.000	0.001	6.42	0.00
Bulloo	5.9	619	0.000	0.000	0.000	0.000	0.000	0.000	0.000	10.91	0.00
Simpson Desert	5.10	1965	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6.45	0.00
Dieri	5.11	259	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.62	0.00
Strzelecki Desert	5.12	402	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.73	0.00
Coongie	5.13	6	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6.82	0.00
West Balonne Plains	6.1	1991	7.111	0.000	0.014	0.000	0.021	0.000	7.145	39.11	4.65
Eastern Mulga Plains	6.2	1563	5.022	0.000	0.000	0.000	0.010	0.000	5.031	61.24	3.27
Nebine Plains	6.3	1208	2.255	0.000	0.000	0.000	0.052	0.000	2.307	65.18	1.50
North Eastern Plains	6.4	660	4.733	0.000	0.000	0.000	0.009	0.000	4.742	58.43	3.09
Warrego Plains	6.5	2168	0.877	0.000	0.000	0.000	0.104	0.002	0.983	49.79	0.64
Langlo Plains	6.6	1290	6.778	0.000	0.000	0.000	0.126	0.000	6.904	70.22	4.49
Cuttaburra - Paroo	6.7	644	0.309	0.000	0.000	0.000	0.085	0.001	0.395	69.22	0.26
West Warrego	6.8	4221	1.283	0.000	0.000	0.000	0.117	0.000	1.400	44.54	0.91
Northern Uplands	6.9	1148	0.027	0.000	0.000	0.000	0.007	0.000	0.035	74.66	0.02
West Bulloo	6.10	2852	0.398	0.000	0.000	0.000	0.015	0.000	0.413	23.43	0.27
Urisino Sandplains	6.11	860	0.000	0.000	0.000	0.000	0.000	0.000	0.000	21.71	0.00
Herbert	7.1	222	0.060	0.000	0.600	0.000	0.004	0.001	0.664	52.65	0.43
Tully	7.2	139	0.005	0.007	0.421	0.000	0.000	0.000	0.434	57.54	0.28
Innisfail	7.3	196	0.010	0.000	0.000	0.000	0.000	0.001	0.011	53.33	0.01
Atherton	7.4	177	0.034	0.012	0.000	0.025	0.003	0.000	0.074	80.19	0.05
Paluma - Seaview	7.5	234	0.050	0.000	0.015	0.000	0.013	0.000	0.078	99.37	0.05
Kirrama - Hinchinbrook	7.6	283	0.024	0.000	0.019	0.000	0.001	0.000	0.044	98.59	0.03
Bellenden Ker - Lamb	7.7	271	0.016	0.000	0.053	0.000	0.000	0.000	0.069	97.51	0.05
Macalister	7.8	113	0.042	0.000	0.000	0.000	0.000	0.001	0.044	95.04	0.03
Daintree - Bloomfield	7.9	358	0.006	0.001	0.000	0.000	0.000	0.000	0.007	96.39	0.00
Whitsunday	8.1	91	0.003	0.000	0.000	0.000	0.000	0.002	0.005	93.76	0.00
Proserpine - Sarina Lowlands	8.2	472	0.593	0.050	0.050	0.002	0.016	0.014	0.725	48.34	0.47

¹ Based on the wooded extent and FPC index V2.3

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Table 17 (cont.): Woody vegetation clearing by land cover by biogeographic sub-region (2011–12)

Biogeographic sub-region ²			Rate of woody vegetation clearing (,000ha/yr)							% wooded vegetation cover 2011 ¹	% total clearing in QLD
Name	Ref. No.	Total area (,000ha)	Pasture	Crops	Forest	Mining	Infra-structure	Settle-ment	Total		
Clarke - Connors Ranges	8.3	632	0.195	0.000	0.073	0.006	0.002	0.000	0.276	93.12	0.18
Byfield	8.4	128	0.009	0.000	0.195	0.000	0.000	0.000	0.204	95.90	0.13
Manifold	8.5	80	0.001	0.000	0.000	0.000	0.000	0.000	0.001	82.35	0.00
Debella	8.6	82	0.090	0.000	0.000	0.001	0.000	0.000	0.092	71.15	0.06
Georgetown - Croydon	9.1	1041	0.019	0.000	0.000	0.000	0.010	0.000	0.029	85.80	0.02
Kidston	9.2	2930	0.152	0.000	0.000	0.002	0.034	0.000	0.189	94.37	0.12
Hodgkinson Basin	9.3	1607	0.180	0.055	0.000	0.007	0.005	0.000	0.247	93.33	0.16
Broken River	9.4	3310	0.364	0.000	0.000	0.011	0.035	0.000	0.410	75.64	0.27
Undara - Toomba Basalts	9.5	2076	0.068	0.000	0.000	0.000	0.010	0.000	0.078	84.93	0.05
Herberton - Wairuna	9.6	662	0.128	0.000	0.000	0.000	0.000	0.000	0.128	95.47	0.08
Prairie - Torrens Creeks Alluvials	10.1	1580	0.945	0.000	0.000	0.000	0.004	0.000	0.949	51.80	0.62
Alice Tableland	10.2	2867	0.989	0.000	0.000	0.063	0.304	0.000	1.355	74.86	0.88
Cape - Campaspe Plains	10.3	1007	3.138	0.000	0.000	0.000	0.018	0.000	3.156	62.37	2.05
Jericho	10.4	1487	2.809	0.000	0.000	0.001	0.055	0.001	2.865	60.59	1.86
Townsville Plains	11.1	768	0.285	0.000	0.000	0.010	0.029	0.187	0.511	45.58	0.33
Bogie River Hills	11.2	1055	1.661	0.007	0.000	0.158	0.006	0.000	1.834	62.55	1.19
Cape River Hills	11.3	748	1.276	0.000	0.000	0.040	0.000	0.000	1.316	72.63	0.86
Beucazon Hills	11.4	96	1.763	0.000	0.000	0.000	0.000	0.000	1.763	57.71	1.15
Wyarra Hills	11.5	398	0.043	0.000	0.000	0.000	0.000	0.000	0.043	71.41	0.03
Northern Bowen Basin	11.6	1317	1.181	0.000	0.005	1.128	0.039	0.032	2.384	60.12	1.55
Belyando Downs	11.7	1772	5.549	0.000	0.000	0.001	0.005	0.000	5.555	40.45	3.62
Upper Belyando Floodout	11.8	466	1.153	0.000	0.000	0.000	0.008	0.000	1.162	31.95	0.76
Anakie Inlier	11.9	382	1.601	0.000	0.051	0.110	0.051	0.000	1.812	85.90	1.18
Basalt Downs	11.10	1275	1.705	0.000	0.010	0.036	0.005	0.000	1.756	37.33	1.14
Isaac - Comet Downs	11.11	2693	13.231	0.000	0.026	1.200	0.064	0.008	14.528	39.50	9.46
Nebo - Connors Ranges	11.12	449	0.405	0.000	0.000	0.002	0.007	0.000	0.414	65.92	0.27
South Drummond Basin	11.13	1009	1.182	0.000	0.159	0.000	0.004	0.000	1.345	56.38	0.88
Marlborough Plains	11.14	1217	1.463	0.000	0.170	0.054	0.010	0.005	1.702	58.54	1.11
Claude River Downs	11.15	1026	1.844	0.000	0.000	0.000	0.023	0.000	1.867	56.28	1.22
Woorabinda	11.16	750	2.898	0.000	0.101	0.004	0.134	0.000	3.137	85.72	2.04

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Table 17 (cont.): Woody vegetation clearing by land cover by biogeographic sub-region (2011–12)

Biogeographic sub-region ²			Rate of woody vegetation clearing (,000ha/yr)							% wooded vegetation cover 2011 ¹	% total clearing in QLD
Name	Ref. No.	Total area (,000ha)	Pasture	Crops	Forest	Mining	Infra-structure	Settle-ment	Total		
Boomer Range	11.17	221	0.316	0.000	0.000	0.000	0.000	0.000	0.316	72.42	0.21
Mount Morgan Ranges	11.18	1276	2.314	0.001	0.043	0.104	0.067	0.010	2.538	63.15	1.65
Callide Creek Downs	11.19	301	0.223	0.006	0.159	0.007	0.000	0.000	0.395	29.15	0.26
Arcadia	11.20	715	1.372	0.003	0.002	0.000	0.008	0.000	1.386	64.94	0.90
Dawson River Downs	11.21	983	1.527	0.005	0.000	0.185	0.007	0.000	1.725	30.59	1.12
Banana - Auburn Ranges	11.22	1548	3.888	0.000	0.247	0.000	0.024	0.000	4.159	59.52	2.71
Buckland Basalts	11.23	281	0.187	0.000	0.000	0.000	0.000	0.000	0.187	95.24	0.12
Carnarvon Ranges	11.24	2264	3.082	0.000	0.114	0.065	0.143	0.000	3.403	91.15	2.22
Taroom Downs	11.25	652	0.793	0.000	0.000		0.006	0.000	0.800	15.90	0.52
Southern Downs	11.26	4265	12.730	0.000	0.224	0.043	0.109	0.001	13.108	43.94	8.53
Barakula	11.27	1302	3.919	0.000	0.137	0.518	0.497	0.012	5.084	67.09	3.31
Dulacca Downs	11.28	162	0.349	0.000	0.000	0.000	0.020	0.000	0.369	23.33	0.24
Weribone High	11.29	967	2.568	0.107	0.000	0.000	0.009	0.000	2.683	39.70	1.75
Tara Downs	11.30	511	0.994	0.003	0.000	0.001	0.000	0.000	0.998	15.05	0.65
Eastern Darling Downs	11.31	1698	1.105	0.017	0.001	0.009	0.040	0.003	1.175	21.32	0.77
Inglewood Sandstones	11.32	1219	3.116	0.002	0.172	0.224	0.780	0.000	4.294	70.83	2.80
Moonie R. - Commoron Creek Floodout	11.33	751	0.791	0.003	0.000	0.001	0.010	0.000	0.805	26.60	0.52
Moonie - Barwon Interfluve	11.34	689	2.850	0.008	0.000	0.000	0.013	0.000	2.871	24.65	1.87
Warrambool - Moonie	11.35	574	0.100	0.000	0.000	0.000	0.000	0.000	0.101	30.15	0.07
Macintyre - Weir Fan	11.36	292	0.108	0.020	0.000	0.000	0.003	0.000	0.130	21.88	0.08
Culgoa - Bokhara	11.37	420	0.022	0.000	0.000	0.000	0.019	0.000	0.041	36.38	0.03
Narrandool	11.38	16	0.004	0.000	0.000	0.000	0.001	0.000	0.005	49.79	0.00
Scenic Rim	12.1	229	0.010	0.000	0.011	0.000	0.000	0.002	0.024	84.64	0.02
Moreton Basin	12.2	785	0.495	0.000	0.025	0.029	0.075	0.453	1.078	58.74	0.70
Burringbar - Conondale Ranges	12.3	535	0.223	0.000	0.152	0.012	0.027	0.175	0.590	77.46	0.38
Sunshine Coast - Gold Coast Lowlands	12.4	365	0.223	0.000	0.317	0.093	0.076	0.194	0.902	65.00	0.59
Brisbane - Barambah Volcanics	12.5	807	0.224	0.000	0.180	0.000	0.013	0.000	0.416	61.96	0.27
South Burnett	12.6	564	0.826	0.002	0.103	0.081	0.007	0.000	1.018	54.06	0.66
Gympie Block	12.7	859	1.040	0.001	0.329	0.003	0.025	0.007	1.406	73.13	0.92
Burnett - Curtis Coastal Lowlands	12.8	707	0.712	0.073	1.054	0.001	0.017	0.058	1.914	69.82	1.25

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Table 17 (cont.): Woody vegetation clearing by land cover by biogeographic sub-region (2011–12)

Biogeographic sub-region ²			Rate of woody vegetation clearing (,000ha/yr)							% wooded vegetation cover 2011 ¹	% total clearing in QLD
Name	Ref. No.	Total area (,000ha)	Pasture	Crops	Forest	Mining	Infra-structure	Settle-ment	Total		
Great Sandy	12.9	362	0.016	0.000	1.615	0.000	0.000	0.004	1.636	89.31	1.06
Burnett - Curtis Hills and Ranges	12.10	1032	0.587	0.000	0.182	0.013	0.517	0.147	1.446	82.10	0.94
Woodenbong	12.11	3	0.012	0.000	0.000	0.000	0.000	0.000	0.012	40.92	0.01
Southern Great Barrier Reef	12.12	<1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	23.68	0.00
Stanthorpe Plateau	13.1	138	0.103	0.004	0.073	0.000	0.001	0.004	0.185	69.15	0.12
Tenterfield Plateau	13.2	7	0.000	0.000	0.000	0.000	0.000	0.000	0.000	59.85	0.00
Nandewar Northern Complex	13.3	629	2.558	0.000	0.005	0.007	0.025	0.000	2.595	60.25	1.69

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Table 18: Woody vegetation clearing by tenure by biogeographic sub-region (2011–12)

Biogeographic sub-region ²			Rate of woody vegetation clearing (.000ha/yr)					% wooded vegetation cover 2011 ¹	% total clearing in QLD
Name	Ref. No.	Total area (.000ha)	Freehold	Leasehold	Other	Reserves	Total		
Southwestern Plateaus and Floodouts	1.1	1334	0.000	0.009	0.000	0.000	0.009	61.57	0.01
Thorntonia	1.2	779	0.000	0.000	0.000	0.000	0.000	48.22	0.00
Mount Isa Inlier	1.3	4642	0.004	0.246	0.000	0.000	0.250	59.35	0.16
McArthur	1.4	589	0.000	0.001	0.000	0.000	0.001	84.24	0.00
Karumba Plains	2.1	1071	0.000	0.000	0.000	0.000	0.000	36.88	0.00
Armraynald Plains	2.2	1589	0.000	0.045	0.000	0.000	0.045	46.29	0.03
Woondoola Plains	2.3	2375	0.072	0.111	0.000	0.000	0.183	28.41	0.12
Mitchell - Gilbert Fans	2.4	5263	0.008	0.560	0.000	0.000	0.569	87.23	0.37
Claraville Plains	2.5	3738	0.125	0.531	0.000	0.000	0.657	80.05	0.43
Holroyd Plain - Red Plateau	2.6	2208	0.013	0.117	0.000	0.000	0.131	92.26	0.09
Doomadgee Plains	2.7	1685	0.000	0.063	0.000	0.000	0.063	91.47	0.04
Donors Plateau	2.8	2450	0.240	0.357	0.000	0.000	0.597	48.58	0.39
Gilberton Plateau	2.9	1404	0.000	0.051	0.000	0.000	0.051	95.08	0.03
Wellesley Islands	2.10	128	0.000	0.000	0.000	0.000	0.000	83.54	0.00
Coen - Yambo Inlier	3.1	2313	0.002	0.070	0.000	0.000	0.072	97.30	0.05
Starke Coastal Lowlands	3.2	514	0.101	0.032	0.000	0.005	0.139	94.00	0.09
Cape York - Torres Strait	3.3	102	0.000	0.000	0.000	0.000	0.000	66.60	0.00
Jardine - Pascoe Sandstones	3.4	1451	0.005	0.010	0.000	0.000	0.015	96.91	0.01
Battle Camp Sandstones	3.5	505	0.001	0.000	0.000	0.000	0.001	99.39	0.00
Laura Lowlands	3.6	1792	0.004	0.079	0.000	0.045	0.128	92.85	0.08
Weipa Plateau	3.7	2876	0.022	0.072	1.518	0.000	1.612	95.22	1.05
Northern Holroyd Plain	3.8	2464	0.001	0.053	0.000	0.000	0.054	89.57	0.04
Coastal Plains	3.9	289	0.000	0.010	0.000	0.002	0.012	50.86	0.01
Georgina Limestone	4.1	1438	0.000	0.002	0.000	0.000	0.002	12.27	0.00
Southwestern Downs	4.2	3715	0.000	0.019	0.000	0.000	0.019	6.51	0.01
Kynuna Plateau	4.3	2293	0.000	0.005	0.000	0.000	0.005	28.02	0.00
Southern Wooded Downs	4.4	4721	3.821	1.670	0.000	0.000	5.491	30.56	3.57
Central Downs	4.5	9379	0.548	0.275	0.000	0.000	0.824	5.50	0.54
Flinders	4.6	435	0.075	0.097	0.000	0.000	0.172	29.79	0.11
Barkly Tableland	4.7	2181	0.000	0.000	0.000	0.000	0.000	5.57	0.00
Toko Plains	5.1	498	0.000	0.000	0.000	0.000	0.000	14.41	0.00
Sturt Stony Desert	5.2	5774	0.000	0.000	0.000	0.000	0.000	2.71	0.00
Georgina - Eyre Plains	5.3	1213	0.000	0.000	0.000	0.000	0.000	5.48	0.00
Goneaway Tablelands	5.4	5182	0.000	0.091	0.000	0.000	0.091	26.07	0.06
Cooper - Diamantina Plains	5.5	3438	0.000	0.030	0.000	0.000	0.031	10.51	0.02

¹ Based on the wooded extent and FPC index V2.3

² Analysis against version 5.0 of the biogeographic sub-region dataset resulted in a change in some names and reference numbers relative to previous SLATS reports. Refer to companion spreadsheet for full details on how the new sub-regions relate to previous SLATS reports.

Table 18 (continued): Woody vegetation clearing by tenure by biogeographic sub-region (2011–12)

Biogeographic sub-region ²			Rate of woody vegetation clearing (.000ha/yr)					% wooded vegetation cover 2011 ¹	% total clearing in QLD
Name	Ref. No.	Total area (.000ha)	Freehold	Leasehold	Other	Reserves	Total		
Noccundra Slopes	5.6	1799	0.000	0.000	0.000	0.000	0.000	13.60	0.00
Lake Pure	5.7	985	0.000	0.000	0.000	0.000	0.000	4.06	0.00
Bulloo Dunefields	5.8	1077	0.000	0.001	0.000	0.000	0.001	6.42	0.00
Bulloo	5.9	619	0.000	0.000	0.000	0.000	0.000	10.91	0.00
Simpson Desert	5.10	1965	0.000	0.000	0.000	0.000	0.000	6.45	0.00
Dieri	5.11	259	0.000	0.000	0.000	0.000	0.000	0.62	0.00
Strzelecki Desert	5.12	402	0.000	0.000	0.000	0.000	0.000	1.73	0.00
Coongie	5.13	6	0.000	0.000	0.000	0.000	0.000	6.82	0.00
West Balonne Plains	6.1	1991	6.468	0.663	0.000	0.014	7.145	39.11	4.65
Eastern Mulga Plains	6.2	1563	4.133	0.898	0.000	0.000	5.031	61.24	3.27
Nebine Plains	6.3	1208	2.017	0.290	0.000	0.000	2.307	65.18	1.50
North Eastern Plains	6.4	660	4.152	0.590	0.000	0.000	4.742	58.43	3.09
Warrego Plains	6.5	2168	0.765	0.201	0.000	0.016	0.983	49.79	0.64
Langlo Plains	6.6	1290	2.412	4.492	0.000	0.000	6.904	70.22	4.49
Cuttaburra - Paroo	6.7	644	0.232	0.136	0.000	0.026	0.395	69.22	0.26
West Warrego	6.8	4221	0.229	1.171	0.000	0.000	1.400	44.54	0.91
Northern Uplands	6.9	1148	0.000	0.031	0.000	0.004	0.035	74.66	0.02
West Bulloo	6.10	2852	0.069	0.344	0.000	0.000	0.413	23.43	0.27
Urisino Sandplains	6.11	860	0.000	0.000	0.000	0.000	0.000	21.71	0.00
Herbert	7.1	222	0.057	0.012	0.000	0.595	0.664	52.65	0.43
Tully	7.2	139	0.012	0.005	0.000	0.418	0.434	57.54	0.28
Innisfail	7.3	196	0.011	0.000	0.000	0.000	0.011	53.33	0.01
Atherton	7.4	177	0.040	0.034	0.000	0.000	0.074	80.19	0.05
Paluma - Seaview	7.5	234	0.002	0.058	0.000	0.017	0.078	99.37	0.05
Kirrama - Hinchinbrook	7.6	283	0.023	0.001	0.000	0.020	0.044	98.59	0.03
Bellenden Ker - Lamb	7.7	271	0.013	0.003	0.000	0.054	0.069	97.51	0.05
Macalister	7.8	113	0.036	0.008	0.000	0.000	0.044	95.04	0.03
Daintree - Bloomfield	7.9	358	0.006	0.000	0.000	0.001	0.007	96.39	0.00
Whitsunday	8.1	91	0.004	0.001	0.000	0.000	0.005	93.76	0.00
Proserpine - Sarina Lowlands	8.2	472	0.638	0.036	0.000	0.050	0.724	48.34	0.47
Clarke - Connors Ranges	8.3	632	0.142	0.061	0.000	0.073	0.276	93.12	0.18
Byfield	8.4	128	0.009	0.000	0.000	0.195	0.204	95.90	0.13
Manifold	8.5	80	0.001	0.000	0.000	0.000	0.001	82.35	0.00
Debella	8.6	82	0.084	0.008	0.000	0.000	0.092	71.15	0.06
Georgetown - Croydon	9.1	1041	0.000	0.029	0.000	0.000	0.029	85.80	0.02

¹ Based on the wooded extent and FPC index V2.3² Analysis against version 5.0 of the biogeographic sub-region dataset resulted in a change in some names and reference numbers relative to previous SLATS reports. Refer to companion spreadsheet for full details on how the new sub-regions relate to previous SLATS reports.

Table 18 (continued): Woody vegetation clearing by tenure by biogeographic sub-region (2011–12)

Biogeographic sub-region ²			Rate of woody vegetation clearing (,000ha/yr)					% wooded vegetation cover 2011 ¹	% total clearing in QLD
Name	Ref. No.	Total area (,000ha)	Freehold	Leasehold	Other	Reserves	Total		
Kidston	9.2	2930	0.000	0.188	0.000	0.000	0.189	94.37	0.12
Hodgkinson Basin	9.3	1607	0.094	0.150	0.000	0.003	0.247	93.33	0.16
Broken River	9.4	3310	0.062	0.347	0.001	0.000	0.410	75.64	0.27
Undara - Toomba Basalts	9.5	2076	0.000	0.078	0.000	0.000	0.078	84.93	0.05
Herberton - Wairuna	9.6	662	0.011	0.118	0.000	0.000	0.128	95.47	0.08
Prairie - Torrens Creeks Alluvials	10.1	1580	0.153	0.796	0.000	0.000	0.949	51.80	0.62
Alice Tableland	10.2	2867	0.048	1.302	0.000	0.004	1.355	74.86	0.88
Cape - Campaspe Plains	10.3	1007	0.594	2.562	0.000	0.000	3.156	62.37	2.05
Jericho	10.4	1487	0.745	2.120	0.000	0.000	2.865	60.59	1.86
Townsville Plains	11.1	768	0.477	0.034	0.000	0.000	0.511	45.58	0.33
Bogie River Hills	11.2	1055	0.975	0.857	0.000	0.001	1.834	62.55	1.19
Cape River Hills	11.3	748	0.002	1.315	0.000	0.000	1.316	72.63	0.86
Beucazon Hills	11.4	96	0.008	1.755	0.000	0.000	1.763	57.71	1.15
Wyarra Hills	11.5	398	0.000	0.043	0.000	0.000	0.043	71.41	0.03
Northern Bowen Basin	11.6	1317	1.085	1.296	0.000	0.003	2.384	60.12	1.55
Belyando Downs	11.7	1772	0.999	4.556	0.000	0.000	5.555	40.45	3.62
Upper Belyando Floodout	11.8	466	0.672	0.490	0.000	0.000	1.162	31.95	0.76
Anakie Inlier	11.9	382	0.456	1.288	0.000	0.068	1.812	85.90	1.18
Basalt Downs	11.10	1275	1.373	0.373	0.000	0.010	1.756	37.33	1.14
Isaac - Comet Downs	11.11	2693	13.155	1.343	0.000	0.030	14.528	39.50	9.46
Nebo - Connors Ranges	11.12	449	0.392	0.022	0.000	0.000	0.414	65.92	0.27
South Drummond Basin	11.13	1009	0.168	1.017	0.000	0.160	1.345	56.38	0.88
Marlborough Plains	11.14	1217	1.420	0.282	0.000	0.000	1.701	58.54	1.11
Claude River Downs	11.15	1026	0.205	1.662	0.000	0.000	1.867	56.28	1.22
Woorabinda	11.16	750	2.690	0.346	0.000	0.101	3.137	85.72	2.04
Boomer Range	11.17	221	0.133	0.183	0.000	0.000	0.316	72.42	0.21
Mount Morgan Ranges	11.18	1276	2.022	0.440	0.000	0.076	2.538	63.15	1.65
Callide Creek Downs	11.19	301	0.226	0.009	0.000	0.159	0.395	29.15	0.26
Arcadia	11.20	715	0.752	0.631	0.000	0.003	1.386	64.94	0.90
Dawson River Downs	11.21	983	1.529	0.194	0.000	0.001	1.725	30.59	1.12
Banana - Auburn Ranges	11.22	1548	3.301	0.725	0.000	0.133	4.159	59.52	2.71
Buckland Basalts	11.23	281	0.003	0.175	0.000	0.009	0.187	95.24	0.12
Carnarvon Ranges	11.24	2264	0.272	2.947	0.000	0.184	3.403	91.15	2.22
Taroom Downs	11.25	652	0.634	0.165	0.000	0.000	0.800	15.90	0.52
Southern Downs	11.26	4265	10.147	2.735	0.000	0.227	13.108	43.94	8.53

¹ Based on the wooded extent and FPC index V2.3

² Analysis against version 5.0 of the biogeographic sub-region dataset resulted in a change in some names and reference numbers relative to previous SLATS reports. Refer to companion spreadsheet for full details on how the new sub-regions relate to previous SLATS reports.

Table 18 (continued): Woody vegetation clearing by tenure by biogeographic sub-region (2011–12)

Biogeographic sub-region ²			Rate of woody vegetation clearing (.000ha/yr)					% wooded vegetation cover 2011 ¹	% total clearing in QLD
Name	Ref. No.	Total area (.000ha)	Freehold	Leasehold	Other	Reserves	Total		
Barakula	11.27	1302	4.078	0.849	0.000	0.157	5.084	67.09	3.31
Dulacca Downs	11.28	162	0.339	0.030	0.000	0.000	0.369	23.33	0.24
Weribone High	11.29	967	2.535	0.149	0.000	0.000	2.683	39.70	1.75
Tara Downs	11.30	511	0.668	0.330	0.000	0.000	0.998	15.05	0.65
Eastern Darling Downs	11.31	1698	1.144	0.031	0.000	0.001	1.175	21.32	0.77
Inglewood Sandstones	11.32	1219	3.884	0.164	0.000	0.246	4.294	70.83	2.80
Moonie R. - Commoron Creek Floodout	11.33	751	0.714	0.090	0.000	0.000	0.805	26.60	0.52
Moonie - Barwon Interfluve	11.34	689	2.851	0.020	0.000	0.000	2.871	24.65	1.87
Warrambool - Moonie	11.35	574	0.092	0.006	0.003	0.000	0.101	30.15	0.07
Macintyre - Weir Fan	11.36	292	0.104	0.026	0.000	0.000	0.130	21.88	0.08
Culgoa - Bokhara	11.37	420	0.036	0.005	0.000	0.000	0.041	36.38	0.03
Narrandool	11.38	16	0.004	0.001	0.000	0.000	0.005	49.79	0.00
Scenic Rim	12.1	229	0.012	0.000	0.000	0.011	0.024	84.64	0.02
Moreton Basin	12.2	785	0.957	0.105	0.000	0.017	1.078	58.74	0.70
Burringbar - Conondale Ranges	12.3	535	0.407	0.033	0.000	0.150	0.590	77.46	0.38
Sunshine Coast - Gold Coast Lowlands	12.4	365	0.389	0.218	0.000	0.294	0.901	65.00	0.59
Brisbane - Barambah Volcanics	12.5	807	0.215	0.018	0.000	0.183	0.416	61.96	0.27
South Burnett	12.6	564	0.860	0.054	0.000	0.104	1.018	54.06	0.66
Gympie Block	12.7	859	1.048	0.030	0.000	0.328	1.406	73.13	0.92
Burnett - Curtis Coastal Lowlands	12.8	707	0.804	0.072	0.000	1.039	1.914	69.82	1.25
Great Sandy	12.9	362	0.020	0.002	0.000	1.614	1.636	89.31	1.06
Burnett - Curtis Hills and Ranges	12.10	1032	1.106	0.311	0.001	0.028	1.446	82.10	0.94
Woodenbong	12.11	3	0.012	0.000	0.000	0.000	0.012	40.92	0.01
Southern Great Barrier Reef	12.12	0	0.000	0.000	0.000	0.000	0.000	23.68	0.00
Stanthorpe Plateau	13.1	138	0.110	0.003	0.000	0.071	0.185	69.15	0.12
Tenterfield Plateau	13.2	7	0.000	0.000	0.000	0.000	0.000	59.85	0.00
Nandewar Northern Complex	13.3	629	2.561	0.027	0.000	0.007	2.595	60.25	1.69

¹ Based on the wooded extent and FPC index V2.3

² Analysis against version 5.0 of the biogeographic sub-region dataset resulted in a change in some names and reference numbers relative to previous SLATS reports. Refer to companion spreadsheet for full details on how the new sub-regions relate to previous SLATS reports.

Appendix D Woody vegetation clearing by catchment (2011–12)

Table 19: Woody vegetation clearing by land cover by catchment (2011–12)

Catchment			Rate of woody vegetation clearing (,000ha/yr)							% wooded vegetation cover 2011 ¹	% total clearing in QLD
Name	Map Ref.	Total area (,000ha)	Pasture	Crops	Forest	Mining	Infra-structure	Settle-ment	Total		
Albert	1	78	0.017	0.000	0.000	0.002	0.000	0.011	0.030	70.96	0.02
Alice	2	1294	0.003	0.000	0.000	0.000	0.006	0.000	0.009	89.54	0.01
Archer	3	1061	0.068	0.000	0.000	0.000	0.011	0.000	0.079	94.30	0.05
Baffle Creek ²	4	408	0.528	0.010	0.170	0.000	0.052	0.009	0.770	82.12	0.50
Balonne	5	3837	11.413	0.000	0.298	0.526	0.425	0.012	12.675	35.90	8.25
Barcoo	6	5324	6.073	0.000	0.000	0.000	0.037	0.001	6.111	44.63	3.98
Barker and Barambah Creeks ²	7	593	0.429	0.000	0.196	0.078	0.008	0.000	0.711	59.00	0.46
Barratta Creek ²	8	183	0.030	0.000	0.000	0.000	0.007	0.001	0.037	26.73	0.02
Barron ²	9	219	0.062	0.025	0.052	0.001	0.001	0.001	0.142	78.93	0.09
Black ²	10	106	0.068	0.000	0.000	0.008	0.005	0.010	0.091	85.00	0.06
Bohle ²	11	37	0.014	0.000	0.000	0.002	0.000	0.165	0.181	44.89	0.12
Bowen ²	12	945	0.061	0.000	0.001	0.072	0.007	0.000	0.142	71.00	0.09
Boyne and Auburn ²	13	1300	3.340	0.002	0.220	0.002	0.079	0.000	3.642	64.25	2.37
Boyne ²	14	250	0.150	0.000	0.000	0.003	0.020	0.051	0.225	82.83	0.15
Bremer	15	203	0.068	0.000	0.010	0.008	0.006	0.017	0.108	54.89	0.07
Brisbane	16	697	0.465	0.000	0.086	0.008	0.080	0.123	0.762	65.35	0.50
Bulloo	17	5185	0.668	0.000	0.000	0.000	0.002	0.000	0.670	29.04	0.44
Burrum ²	18	121	0.130	0.001	0.002	0.001	0.006	0.021	0.160	87.55	0.10
Caboolture	19	47	0.138	0.000	0.000	0.000	0.023	0.038	0.199	64.94	0.13
Calliope ²	20	224	0.168	0.001	0.035	0.039	0.193	0.096	0.533	60.20	0.35
Cliffdale	21	619	0.001	0.000	0.000	0.000	0.000	0.000	0.001	89.45	0.00
Cloncurry	22	4734	0.720	0.000	0.000	0.061	0.001	0.001	0.783	26.94	0.51
Coen	23	321	0.000	0.000	0.000	0.000	0.000	0.000	0.000	96.63	0.00
Coleman	24	534	0.011	0.000	0.000	0.000	0.006	0.000	0.018	93.03	0.01
Comet ²	25	1730	3.511	0.003	0.009	0.027	0.019	0.000	3.569	55.53	2.32
Condamine	26	3042	4.839	0.018	0.136	0.229	0.822	0.003	6.047	34.09	3.94
Coomera and Nerang	27	130	0.032	0.000	0.000	0.001	0.010	0.097	0.139	72.08	0.09
Cooper Creek	28	9580	0.387	0.000	0.000	0.000	0.017	0.000	0.404	11.56	0.26
Curtis Island	29	58	0.001	0.000	0.000	0.000	0.258	0.000	0.259	83.39	0.17
Daintree ²	30	211	0.001	0.001	0.000	0.000	0.000	0.000	0.002	96.88	0.00
Dawson ²	31	5078	10.974	0.011	0.333	0.358	0.432	0.000	12.108	51.15	7.88
Diamantina	32	11918	0.016	0.000	0.000	0.000	0.009	0.000	0.025	12.96	0.02
Don ²	33	374	1.071	0.007	0.000	0.000	0.017	0.000	1.095	52.66	0.71
Ducie	34	358	0.001	0.000	0.000	0.000	0.000	0.000	0.001	96.59	0.00
Dumaresq	35	432	1.168	0.006	0.078	0.007	0.005	0.004	1.266	64.75	0.82
Edward	36	752	0.029	0.000	0.000	0.000	0.001	0.000	0.031	85.47	0.02
Eight Mile Creek	37	164	0.002	0.000	0.000	0.000	0.000	0.000	0.002	91.27	0.00
Einisleigh	38	2437	0.095	0.000	0.000	0.001	0.031	0.000	0.128	91.00	0.08

¹ Based on the wooded extent and FPC index V2.3.² Reef catchment – shaded blue.

Table 19 (continued): Woody vegetation clearing by land cover by catchment (2011–12)

Catchment			Rate of woody vegetation clearing (.000ha/yr)							% wooded vegetation cover 2011 ¹	% total clearing in QLD
Name	Map Ref.	Total area (.000ha)	Pasture	Crops	Forest	Mining	Infra-structure	Settle-ment	Total		
Elliott ²	39	72	0.075	0.006	0.489	0.000	0.000	0.000	0.570	57.70	0.37
Embley	40	193	0.000	0.000	0.000	0.158	0.000	0.000	0.158	94.14	0.10
Endeavour ²	41	218	0.075	0.000	0.000	0.000	0.054	0.002	0.132	97.51	0.09
Eyre	42	7184	0.007	0.000	0.000	0.001	0.000	0.000	0.008	6.75	0.01
Fitzroy ²	43	1143	1.914	0.000	0.178	0.048	0.036	0.005	2.182	58.38	1.42
Flinders	44	5202	0.439	0.000	0.000	0.000	0.028	0.000	0.467	39.30	0.30
Fraser Island	45	166	0.001	0.000	0.000	0.000	0.000	0.000	0.001	95.02	0.00
Georgina	46	7222	0.013	0.000	0.000	0.010	0.004	0.000	0.026	23.38	0.02
Gilbert	47	2204	0.124	0.000	0.000	0.001	0.006	0.000	0.131	85.95	0.09
Gregory ²	48	91	0.195	0.023	0.000	0.000	0.018	0.000	0.237	73.94	0.15
Hann ²	49	956	0.007	0.000	0.000	0.000	0.082	0.000	0.089	87.06	0.06
Haughton ²	50	222	0.042	0.000	0.000	0.000	0.002	0.000	0.044	56.78	0.03
Hay	51	280	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.75	0.00
Herbert ²	52	985	0.148	0.002	0.616	0.001	0.012	0.000	0.780	86.83	0.51
Hinchinbrook Island	53	40	0.000	0.000	0.000	0.000	0.000	0.000	0.000	97.61	0.00
Holroyd	54	544	0.003	0.000	0.000	0.000	0.003	0.000	0.006	96.77	0.00
Isaac ²	55	2236	9.114	0.000	0.001	1.421	0.051	0.032	10.620	57.67	6.91
Isis ²	56	53	0.035	0.004	0.001	0.000	0.001	0.000	0.041	87.73	0.03
Jacky Jacky Creek ²	57	296	0.001	0.000	0.000	0.000	0.000	0.000	0.001	96.27	0.00
Jardine	58	328	0.000	0.000	0.000	0.000	0.012	0.000	0.012	97.29	0.01
Jeannie ²	59	364	0.000	0.000	0.000	0.012	0.000	0.000	0.012	93.82	0.01
Kendall	60	485	0.001	0.000	0.000	0.000	0.001	0.000	0.002	98.91	0.00
Kolan ²	61	290	0.318	0.016	0.000	0.000	0.010	0.002	0.346	75.76	0.23
L Creek	62	195	0.000	0.000	0.000	0.000	0.000	0.000	0.000	43.68	0.00
Lagoon Creek	63	286	0.002	0.000	0.000	0.000	0.000	0.000	0.002	93.03	0.00
Lake Frome	64	15	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.31	0.00
Leichhardt	65	3287	0.099	0.000	0.000	0.120	0.007	0.000	0.226	66.59	0.15
Lockhart ²	66	288	0.000	0.000	0.000	0.000	0.000	0.000	0.000	97.82	0.00
Lockyer Creek	67	300	0.241	0.000	0.000	0.013	0.007	0.000	0.261	63.35	0.17
Logan	68	337	0.083	0.000	0.000	0.010	0.014	0.393	0.500	66.79	0.33
Lower Burdekin ²	69	1048	0.746	0.000	0.000	0.160	0.012	0.000	0.918	56.31	0.60
Lower Burnett ²	70	567	0.665	0.010	0.017	0.009	0.003	0.018	0.722	59.80	0.47
Lower Mary ²	71	676	0.512	0.003	1.397	0.000	0.006	0.020	1.937	72.43	1.26
Macintyre and Weir	72	1519	1.507	0.031	0.056	0.001	0.018	0.000	1.612	39.36	1.05
Macintyre Brook	73	432	1.707	0.000	0.011	0.004	0.013	0.000	1.735	60.22	1.13
Mackenzie ²	74	1299	3.593	0.000	0.021	0.730	0.037	0.001	4.382	46.39	2.85

¹ Based on the wooded extent and FPC index V2.3.² Reef catchment – shaded blue.

Table 19 (continued): Woody vegetation clearing by land cover by catchment (2011–12)

Catchment			Rate of woody vegetation clearing (,000ha/yr)							% wooded vegetation cover 2011 ¹	% total clearing in QLD
Name	Map Ref.	Total area (,000ha)	Pasture	Crops	Forest	Mining	Infra-structure	Settle-ment	Total		
Maranoa	75	2004	4.396	0.000	0.037	0.000	0.026	0.001	4.460	65.01	2.90
Maroochy	76	153	0.131	0.000	0.199	0.000	0.010	0.029	0.368	69.48	0.24
Mcdonald	77	272	0.000	0.000	0.000	0.000	0.000	0.000	0.000	96.82	0.00
Misc. Other Islands	78	158	0.000	0.000	0.000	0.000	0.000	0.000	0.000	77.37	0.00
Mission	79	270	0.000	0.000	0.000	1.222	0.050	0.000	1.272	90.93	0.83
Mitchell	80	4143	0.183	0.005	0.000	0.000	0.020	0.000	0.208	86.46	0.14
Moonie	81	1456	4.582	0.110	0.002	0.000	0.018	0.000	4.710	32.52	3.07
Moreton Island	82	17	0.000	0.000	0.000	0.000	0.000	0.000	0.000	91.28	0.00
Morning Inlet	83	173	0.000	0.000	0.000	0.000	0.004	0.000	0.004	56.46	0.00
Mornington Island	84	98	0.000	0.000	0.000	0.000	0.000	0.000	0.000	88.59	0.00
Mossman ²	85	47	0.005	0.000	0.000	0.000	0.000	0.001	0.007	85.93	0.00
Mulgrave ²	86	131	0.000	0.000	0.002	0.000	0.000	0.000	0.002	82.80	0.00
Murray ²	87	111	0.001	0.007	0.439	0.000	0.001	0.000	0.448	76.20	0.29
Nicholson	88	3572	0.069	0.000	0.000	0.000	0.001	0.000	0.070	61.30	0.05
Nogoa ²	89	2769	6.677	0.000	0.061	0.230	0.063	0.007	7.038	58.06	4.58
Noosa	90	195	0.036	0.000	0.955	0.000	0.001	0.007	0.999	87.62	0.65
Norman	91	5042	0.696	0.000	0.000	0.000	0.124	0.000	0.820	84.47	0.53
Normanby ²	92	1484	0.031	0.000	0.000	0.002	0.009	0.000	0.043	94.38	0.03
North Johnstone ²	93	103	0.006	0.010	0.000	0.000	0.000	0.000	0.016	82.27	0.01
North Pine	94	60	0.044	0.000	0.000	0.002	0.010	0.092	0.148	72.04	0.10
O'connell ²	95	239	0.343	0.000	0.120	0.000	0.006	0.008	0.476	69.51	0.31
Olive ²	96	206	0.000	0.000	0.000	0.000	0.000	0.000	0.000	97.86	0.00
Palmer	97	834	0.095	0.000	0.000	0.000	0.002	0.000	0.097	96.15	0.06
Paroo	98	3516	1.291	0.000	0.000	0.000	0.194	0.001	1.486	49.04	0.97
Pascoe ²	99	212	0.000	0.000	0.000	0.000	0.000	0.000	0.000	99.33	0.00
Pioneer ²	100	157	0.024	0.005	0.000	0.000	0.003	0.005	0.037	71.08	0.02
Plane Creek ²	101	254	0.117	0.003	0.002	0.002	0.008	0.001	0.133	57.82	0.09
Proserpine ²	102	249	0.271	0.043	0.000	0.001	0.004	0.002	0.321	71.98	0.21
Ross ²	103	134	0.028	0.000	0.000	0.000	0.003	0.012	0.042	61.01	0.03
Russell ²	104	67	0.000	0.000	0.000	0.000	0.000	0.000	0.000	78.64	0.00
Saxby	105	1015	0.213	0.000	0.000	0.000	0.032	0.000	0.245	52.87	0.16
Settlement	106	117	0.003	0.000	0.000	0.000	0.000	0.000	0.003	88.20	0.00
Shoalwater ²	107	360	0.161	0.000	0.000	0.006	0.000	0.000	0.167	73.24	0.11
Skardon	108	44	0.000	0.000	0.000	0.000	0.000	0.000	0.000	93.53	0.00

¹ Based on the wooded extent and FPC index V2.3.² Reef catchment – shaded blue.

Table 19 (continued): Woody vegetation clearing by land cover by catchment (2011–12)

Catchment			Rate of woody vegetation clearing (.000ha/yr)							% wooded vegetation cover 2011 ¹	% total clearing in QLD
Name	Map Ref.	Total area (.000ha)	Pasture	Crops	Forest	Mining	Infra-structure	Settle-ment	Total		
South Johnstone ²	109	129	0.005	0.000	0.000	0.000	0.000	0.000	0.005	69.25	0.00
South Pine	110	42	0.006	0.000	0.000	0.000	0.027	0.016	0.049	75.01	0.03
Staaten	111	2557	0.093	0.000	0.000	0.000	0.000	0.000	0.094	93.36	0.06
Stanley	112	154	0.162	0.000	0.256	0.000	0.002	0.000	0.420	69.74	0.27
Stewart ²	113	274	0.000	0.000	0.000	0.000	0.000	0.000	0.000	96.13	0.00
Stradbroke Islands	114	29	0.003	0.000	0.000	0.093	0.000	0.000	0.096	84.51	0.06
Styx ²	115	301	0.285	0.000	0.169	0.000	0.000	0.000	0.454	56.55	0.30
Suttor ²	116	7394	14.280	0.000	0.207	0.112	0.360	0.000	14.959	59.18	9.74
Thomson	117	9493	2.135	0.000	0.000	0.000	0.105	0.000	2.240	32.53	1.46
Torres Strait Islands	118	57	0.000	0.000	0.000	0.000	0.000	0.000	0.000	76.16	0.00
Tully ²	119	168	0.006	0.000	0.000	0.000	0.000	0.000	0.006	79.41	0.00
Upper Burdekin ²	120	3624	1.341	0.000	0.000	0.007	0.034	0.000	1.383	80.50	0.90
Upper Burnett ²	121	859	1.400	0.000	0.055	0.000	0.010	0.000	1.465	67.00	0.95
Upper Mary ²	122	271	0.068	0.000	0.150	0.000	0.010	0.006	0.234	76.73	0.15
Wallam Creeks	123	4705	8.952	0.000	0.002	0.000	0.113	0.000	9.067	56.21	5.90
Walsh	124	896	0.131	0.025	0.000	0.030	0.002	0.000	0.189	89.67	0.12
Warrego	125	5308	17.572	0.000	0.022	0.000	0.238	0.002	17.834	56.21	11.61
Waterpark Creek ²	126	184	0.039	0.000	0.017	0.000	0.000	0.002	0.058	86.87	0.04
Watson	127	468	0.141	0.000	0.000	0.000	0.003	0.000	0.144	97.15	0.09
Wenlock	128	753	0.004	0.000	0.000	0.000	0.006	0.000	0.010	96.58	0.01
Whitsunday Island	129	16	0.000	0.000	0.000	0.000	0.000	0.000	0.000	62.80	0.00

¹ Based on the wooded extent and FPC index V2.3.

² Reef catchment – shaded blue.

Table 20: Woody vegetation clearing by tenure by catchment (2011–12)

Catchment			Rate of woody vegetation clearing (,000ha/yr)					% wooded vegetation cover 2011 ¹	% total clearing in QLD
Name	Map Ref.	Total area (,000ha)	Freehold	Leasehold	Other	Reserves	Total		
Albert	1	78	0.029	0.000	0.000	0.000	0.030	70.96	0.02
Alice	2	1294	0.003	0.006	0.000	0.000	0.009	89.54	0.01
Archer	3	1061	0.001	0.078	0.000	0.000	0.079	94.30	0.05
Baffle Creek ²	4	399	0.709	0.047	0.000	0.014	0.770	82.12	0.50
Balonne	5	3828	11.822	0.551	0.003	0.298	12.675	35.90	8.25
Barcoo	6	5323	3.357	2.753	0.000	0.001	6.111	44.63	3.98
Barker and Barambah Creeks ²	7	594	0.473	0.043	0.000	0.196	0.711	59.00	0.46
Barratta Creek ²	8	183	0.028	0.009	0.000	0.000	0.037	26.73	0.02
Barron ²	9	219	0.080	0.010	0.000	0.052	0.142	78.93	0.09
Black ²	10	106	0.083	0.004	0.000	0.004	0.091	85.00	0.06
Bohle ²	11	37	0.173	0.009	0.000	0.000	0.181	44.89	0.12
Bowen ²	12	945	0.052	0.089	0.000	0.002	0.142	71.00	0.09
Boyne and Auburn ²	13	1299	3.036	0.485	0.000	0.121	3.642	64.25	2.37
Boyne ²	14	259	0.198	0.027	0.000	0.000	0.225	82.83	0.15
Bremer	15	203	0.100	0.005	0.000	0.002	0.108	54.89	0.07
Brisbane	16	697	0.571	0.104	0.000	0.087	0.762	65.35	0.50
Bulloo	17	5185	0.366	0.301	0.000	0.003	0.670	29.04	0.44
Burrum ²	18	121	0.146	0.012	0.000	0.002	0.160	87.55	0.10
Caboolture	19	47	0.174	0.025	0.000	0.000	0.199	64.94	0.13
Calliope ²	20	224	0.395	0.135	0.001	0.002	0.533	60.20	0.35
Cliffdale	21	618	0.000	0.001	0.000	0.000	0.001	89.45	0.00
Cloncurry	22	4734	0.313	0.470	0.000	0.000	0.783	26.94	0.51
Coen	23	321	0.000	0.000	0.000	0.000	0.000	96.63	0.00
Coleman	24	534	0.000	0.018	0.000	0.000	0.018	93.03	0.01
Comet ²	25	1730	2.624	0.934	0.000	0.011	3.569	55.53	2.32
Condamine	26	3041	5.376	0.462	0.000	0.210	6.047	34.09	3.94
Coomera and Nerang	27	130	0.124	0.015	0.000	0.000	0.139	72.08	0.09
Cooper Creek	28	9576	0.004	0.400	0.000	0.000	0.404	11.56	0.26
Curtis Island	29	58	0.254	0.005	0.000	0.000	0.259	83.39	0.17
Daintree ²	30	210	0.002	0.000	0.000	0.000	0.002	96.88	0.00
Dawson ²	31	5076	8.963	2.669	0.000	0.477	12.108	51.15	7.88
Diamantina	32	11919	0.000	0.025	0.000	0.000	0.025	12.96	0.02
Don ²	33	369	1.069	0.026	0.000	0.000	1.095	52.66	0.71
Ducie	34	358	0.000	0.001	0.000	0.000	0.001	96.59	0.00
Dumaresq	35	432	1.175	0.014	0.000	0.077	1.266	64.75	0.82
Edward	36	752	0.001	0.030	0.000	0.000	0.031	85.47	0.02
Eight Mile Creek	37	163	0.000	0.002	0.000	0.000	0.002	91.27	0.00
Einasleigh	38	2437	0.000	0.128	0.000	0.000	0.128	91.00	0.08

¹ Based on the wooded extent and FPC index V2.3.² Reef catchment– shaded blue.

Table 20 (continued): Woody vegetation clearing by tenure by catchment (2011–12)

Catchment			Rate of woody vegetation clearing (,000ha/yr)					% wooded vegetation cover 2011 ¹	% total clearing in QLD
Name	Map Ref.	Total area (,000ha)	Freehold	Leasehold	Other	Reserves	Total		
Elliott ²	39	71	0.068	0.013	0.000	0.489	0.570	57.70	0.37
Embley	40	192	0.000	0.006	0.152	0.000	0.158	94.14	0.10
Endeavour ²	41	218	0.093	0.033	0.000	0.006	0.132	97.51	0.09
Eyre	42	7178	0.000	0.008	0.000	0.000	0.008	6.75	0.01
Fitzroy ²	43	1143	1.596	0.409	0.000	0.178	2.182	58.38	1.42
Flinders	44	5188	0.164	0.303	0.000	0.000	0.467	39.30	0.30
Fraser Island	45	166	0.000	0.000	0.000	0.001	0.001	95.02	0.00
Georgina	46	7210	0.000	0.026	0.000	0.000	0.026	23.38	0.02
Gilbert	47	2203	0.009	0.122	0.000	0.000	0.131	85.95	0.09
Gregory ²	48	91	0.220	0.009	0.000	0.008	0.237	73.94	0.15
Hann ²	49	956	0.001	0.041	0.000	0.046	0.089	87.06	0.06
Haughton ²	50	222	0.036	0.007	0.000	0.000	0.044	56.78	0.03
Hay	51	277	0.000	0.000	0.000	0.000	0.000	2.75	0.00
Herbert ²	52	984	0.088	0.081	0.000	0.611	0.780	86.83	0.51
Hinchinbrook Island	53	39	0.000	0.000	0.000	0.000	0.000	97.61	0.00
Holroyd	54	544	0.000	0.006	0.000	0.000	0.006	96.77	0.00
Isaac ²	55	2237	9.095	1.524	0.000	0.001	10.620	57.67	6.91
Isis ²	56	53	0.037	0.001	0.000	0.004	0.041	87.73	0.03
Jacky Jacky Creek ²	57	296	0.000	0.001	0.000	0.000	0.001	96.27	0.00
Jardine	58	328	0.005	0.006	0.000	0.000	0.012	97.29	0.01
Jeannie ²	59	363	0.012	0.000	0.000	0.000	0.012	93.82	0.01
Kendall	60	485	0.000	0.002	0.000	0.000	0.002	98.91	0.00
Kolan ²	61	290	0.220	0.127	0.000	0.000	0.347	75.76	0.23
L Creek	62	194	0.000	0.000	0.000	0.000	0.000	43.68	0.00
Lagoon Creek	63	283	0.000	0.002	0.000	0.000	0.002	93.03	0.00
Lake Frome	64	15	0.000	0.000	0.000	0.000	0.000	2.31	0.00
Leichhardt	65	3288	0.002	0.224	0.000	0.000	0.226	66.59	0.15
Lockhart ²	66	288	0.000	0.000	0.000	0.000	0.000	97.82	0.00
Lockyer Creek	67	301	0.254	0.008	0.000	0.000	0.261	63.35	0.17
Logan	68	336	0.471	0.029	0.000	0.000	0.500	66.79	0.33
Lower Burdekin ²	69	1047	0.053	0.865	0.000	0.000	0.918	56.31	0.60
Lower Burnett ²	70	569	0.684	0.024	0.000	0.014	0.722	59.80	0.47
Lower Mary ²	71	676	0.530	0.033	0.000	1.375	1.937	72.43	1.26
Macintyre and Weir	72	1541	1.405	0.151	0.000	0.057	1.612	39.36	1.05
Macintyre Brook	73	432	1.667	0.057	0.000	0.012	1.735	60.22	1.13
Mackenzie ²	74	1298	3.653	0.707	0.000	0.022	4.382	46.39	2.85

¹ Based on the wooded extent and FPC index V2.3.² Reef catchment– shaded blue.

Table 20 (continued): Woody vegetation clearing by tenure by catchment (2011–12)

Catchment			Rate of woody vegetation clearing (,000ha/yr)					% wooded vegetation cover 2011 ¹	% total clearing in QLD
Name	Map Ref.	Total area (,000ha)	Freehold	Leasehold	Other	Reserves	Total		
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Maroochy	76	154	0.133	0.058	0.000	0.177	0.368	69.48	0.24
Mcdonald	77	271	0.000	0.000	0.000	0.000	0.000	96.82	0.00
Misc. Other Islands	78	176	0.000	0.000	0.000	0.000	0.000	77.37	0.00
Mission	79	268	0.022	0.023	1.227	0.000	1.272	90.93	0.83
Mitchell	80	4143	0.014	0.194	0.000	0.000	0.208	86.46	0.14
Moonie	81	1442	4.628	0.081	0.000	0.002	4.710	32.52	3.07
Moreton Island	82	17	0.000	0.000	0.000	0.000	0.000	91.28	0.00
Morning Inlet	83	173	0.000	0.004	0.000	0.000	0.004	56.46	0.00
Mornington Island	84	100	0.000	0.000	0.000	0.000	0.000	88.59	0.00
Mossman ²	85	47	0.007	0.000	0.000	0.000	0.007	85.93	0.00
Mulgrave ²	86	131	0.000	0.000	0.000	0.002	0.002	82.80	0.00
Murray ²	87	111	0.008	0.003	0.000	0.436	0.448	76.20	0.29
Nicholson	88	3564	0.000	0.070	0.000	0.000	0.070	61.30	0.05
Nogoa ²	89	2770	2.700	4.251	0.000	0.087	7.038	58.06	4.58
Noosa	90	194	0.042	0.003	0.000	0.953	0.999	87.62	0.65
Norman	91	5042	0.002	0.818	0.000	0.000	0.820	84.47	0.53
Normanby ²	92	1485	0.002	0.040	0.000	0.001	0.043	94.38	0.03
North Johnstone ²	93	103	0.016	0.000	0.000	0.000	0.016	82.27	0.01
North Pine	94	60	0.135	0.013	0.000	0.000	0.148	72.04	0.10
O'connell ²	95	238	0.344	0.011	0.000	0.120	0.476	69.51	0.31
Olive ²	96	205	0.000	0.000	0.000	0.000	0.000	97.86	0.00
Palmer	97	832	0.000	0.094	0.000	0.003	0.097	96.15	0.06
Paroo	98	3654	0.392	1.057	0.000	0.037	1.486	49.04	0.97
Pascoe ²	99	212	0.000	0.000	0.000	0.000	0.000	99.33	0.00
Pioneer ²	100	157	0.024	0.013	0.000	0.000	0.037	71.08	0.02
Plane Creek ²	101	253	0.120	0.010	0.000	0.002	0.132	57.82	0.09
Proserpine ²	102	252	0.295	0.026	0.000	0.000	0.321	71.98	0.21
Ross ²	103	134	0.039	0.003	0.000	0.000	0.042	61.01	0.03
Russell ²	104	67	0.000	0.000	0.000	0.000	0.000	78.64	0.00
Saxby	105	1015	0.125	0.121	0.000	0.000	0.245	52.87	0.16
Settlement	106	111	0.000	0.003	0.000	0.000	0.003	88.20	0.00
Shoalwater ²	107	360	0.084	0.084	0.000	0.000	0.167	73.24	0.11
Skardon	108	44	0.000	0.000	0.000	0.000	0.000	93.53	0.00
South Johnstone ²	109	129	0.005	0.000	0.000	0.000	0.005	69.25	0.00
South Pine	110	42	0.036	0.013	0.000	0.000	0.049	75.01	0.03
Staaten	111	2557	0.000	0.094	0.000	0.000	0.094	93.36	0.06

¹ Based on the wooded extent and FPC index V2.3.² Reef catchment– shaded blue.

Table 20 (continued): Woody vegetation clearing by tenure by catchment (2011–12)

Catchment			Rate of woody vegetation clearing (,000ha/yr)					% wooded vegetation cover 2011 ¹	% total clearing in QLD
Name	Map Ref.	Total area (,000ha)	Freehold	Leasehold	Other	Reserves	Total		
Stanley	112	154	0.154	0.011	0.000	0.255	0.420	69.74	0.27
Stewart ²	113	274	0.000	0.000	0.000	0.000	0.000	96.13	0.00
Stradbroke Islands	114	29	0.000	0.096	0.000	0.000	0.096	84.51	0.06
Styx ²	115	301	0.403	0.051	0.000	0.000	0.454	56.55	0.30
Suttor ²	116	7395	2.565	12.182	0.000	0.212	14.959	59.18	9.74
Thomson	117	9507	0.730	1.509	0.000	0.000	2.240	32.53	1.46
Torres Strait Islands	118	29	0.000	0.000	0.000	0.000	0.000	76.16	0.00
Tully ²	119	168	0.004	0.002	0.000	0.000	0.006	79.41	0.00
Upper Burdekin ²	120	3625	0.053	1.328	0.001	0.000	1.383	80.50	0.90
Upper Burnett ²	121	860	1.045	0.365	0.000	0.055	1.465	67.00	0.95
Upper Mary ²	122	271	0.075	0.012	0.000	0.148	0.234	76.73	0.15
Wallam Creeks	123	4704	7.263	1.802	0.000	0.002	9.067	56.21	5.90
Walsh	124	896	0.061	0.127	0.000	0.000	0.189	89.67	0.12
Warrego	125	5169	9.920	7.879	0.000	0.028	17.828	56.21	11.60
Waterpark Creek ²	126	183	0.041	0.001	0.000	0.017	0.058	86.87	0.04
Watson	127	468	0.000	0.004	0.139	0.000	0.144	97.15	0.09
Wenlock	128	752	0.001	0.008	0.000	0.000	0.010	96.58	0.01
Whitsunday Island	129	11	0.000	0.000	0.000	0.000	0.000	62.80	0.00

¹ Based on the wooded extent and FPC index V2.3.

² Reef catchment– shaded blue.

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Appendix E Woody vegetation clearing by local government area (2011–12)

Table 21: Woody vegetation clearing by land cover by local government area (2011–12)

Local government area			Rate of woody vegetation clearing (,000ha/yr)							% wooded vegetation cover 2011 ¹	% total clearing in QLD
Name	Map Ref.	Total area (,000ha)	Pasture	Crops	Forest	Mining	Infra-structure	Settle-ment	Total		
Aurukun Shire	1	733	0.057	0.000	0.000	0.000	0.003	0.000	0.061	92.43	0.04
Balonne Shire	2	3111	8.401	0.000	0.012	0.000	0.054	0.000	8.467	36.73	5.51
Banana Shire	3	2855	4.765	0.008	0.220	0.282	0.080	0.000	5.355	51.07	3.49
Barcaldine Shire	4	5338	5.511	0.000	0.000	0.001	0.165	0.001	5.679	40.97	3.70
Barcoo Shire	5	6183	0.398	0.000	0.000	0.000	0.044	0.000	0.442	18.49	0.29
Blackall Tambo Regional	6	3054	7.490	0.000	0.042	0.000	0.036	0.000	7.569	41.95	4.93
Boulia Shire	7	6097	0.001	0.000	0.000	0.000	0.002	0.000	0.003	14.58	0.00
Brisbane City	8	134	0.013	0.000	0.000	0.000	0.058	0.103	0.174	76.95	0.11
Bulloo Shire	9	7372	0.009	0.000	0.000	0.000	0.004	0.000	0.013	12.36	0.01
Bundaberg Shire	10	643	0.750	0.070	0.508	0.003	0.009	0.020	1.361	70.40	0.89
Burdekin Shire	11	501	1.121	0.000	0.000	0.000	0.007	0.001	1.129	38.73	0.73
Burke Shire	12	4009	0.120	0.000	0.000	0.000	0.000	0.000	0.120	71.82	0.08
Cairns Regional ²	13	169	0.003	0.000	0.000	0.000	0.000	0.001	0.005	76.33	0.00
Carpentaria Shire	14	6412	0.284	0.000	0.000	0.000	0.022	0.000	0.306	70.02	0.20
Cassowary Coast Regional	15	469	0.013	0.007	0.439	0.000	0.001	0.000	0.460	76.00	0.30
Central Highlands Regional	16	5983	13.931	0.006	0.125	0.545	0.185	0.008	14.800	55.85	9.63
Charters Towers Regional	17	6838	4.152	0.000	0.000	0.052	0.068	0.000	4.271	75.47	2.78
Cherbourg Aboriginal Shire	18	3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	82.88	0.00
Cloncurry Shire	19	4797	0.603	0.000	0.000	0.072	0.003	0.001	0.678	39.73	0.44
Cook Shire	20	10572	0.407	0.000	0.000	1.382	0.169	0.002	1.960	94.81	1.28
Croydon Shire	21	2950	0.423	0.000	0.000	0.000	0.112	0.000	0.535	89.33	0.35
Diamantina Shire	22	9468	0.001	0.000	0.000	0.000	0.000	0.000	0.001	4.56	0.00
Doomadgee Aboriginal Shire	23	182	0.000	0.000	0.000	0.000	0.001	0.000	0.001	85.56	0.00
Etheridge Shire	24	3923	0.219	0.000	0.000	0.003	0.042	0.000	0.264	91.69	0.17
Flinders Shire	25	4120	1.394	0.000	0.000	0.000	0.030	0.000	1.424	49.74	0.93
Fraser Coast Regional	26	710	0.489	0.004	1.176	0.001	0.007	0.035	1.711	83.79	1.11
Gladstone Regional	27	1047	1.189	0.001	0.206	0.042	0.540	0.156	2.134	75.75	1.39
Gold Coast City	28	132	0.031	0.000	0.000	0.006	0.010	0.110	0.157	69.21	0.10
Goondiwindi Regional	29	1928	3.785	0.033	0.025	0.012	0.027	0.000	3.882	39.18	2.53
Gympie Regional	30	689	0.222	0.000	1.415	0.000	0.013	0.007	1.657	71.60	1.08
Hinchinbrook Shire	31	280	0.066	0.000	0.616	0.000	0.013	0.000	0.695	64.80	0.45

¹ Based on the wooded extent and FPC index V2.3.

² Shires have altered in the de-amalgamation process current as of 1 January 2014, extents and total areas of these shires have changed since last reported.

Table 21 (continued): Woody vegetation clearing by land cover by local government area (2011–12)

Local government area			Rate of woody vegetation clearing (,000ha/yr)							% wooded vegetation cover 2011 ¹	% total clearing in QLD
Name	Map Ref.	Total area (,000ha)	Pasture	Crops	Forest	Mining	Infra-structure	Settle-ment	Total		
Hope Vale Aboriginal Shire	32	111	0.005	0.000	0.000	0.012	0.041	0.000	0.059	92.12	0.04
Ipswich City	33	109	0.063	0.000	0.000	0.014	0.046	0.058	0.182	59.14	0.12
Isaac Regional	34	5870	17.827	0.000	0.398	1.931	0.364	0.032	20.553	53.98	13.38
Kowanyama Aboriginal Shire	35	252	0.000	0.000	0.000	0.000	0.006	0.000	0.006	65.83	0.00
Lockhart River Aboriginal Shire	36	357	0.001	0.000	0.000	0.000	0.001	0.000	0.001	98.84	0.00
Lockyer Valley Regional	37	227	0.172	0.000	0.000	0.009	0.007	0.000	0.188	64.48	0.12
Logan City	38	96	0.075	0.000	0.000	0.002	0.005	0.349	0.432	78.25	0.28
Longreach Regional	39	4057	1.519	0.000	0.000	0.000	0.006	0.000	1.525	26.49	0.99
Mackay Regional	40	780	0.438	0.008	0.123	0.002	0.015	0.014	0.599	68.14	0.39
Mapoon Aboriginal Shire	41	49	0.000	0.000	0.000	0.000	0.000	0.000	0.000	90.44	0.00
Maranoa Regional	42	5870	17.243	0.049	0.274	0.048	0.105	0.001	17.721	52.18	11.53
McKinlay Shire	43	4073	0.233	0.000	0.000	0.000	0.001	0.000	0.234	24.77	0.15
Moreton Bay Regional	44	204	0.229	0.000	0.321	0.002	0.036	0.138	0.727	72.51	0.47
Mornington Shire	45	120	0.014	0.000	0.000	0.120	0.005	0.000	0.139	86.27	0.09
Mount Isa City	46	4327	12.925	0.000	0.004	0.000	0.214	0.002	13.145	50.36	8.56
Murweh Shire	47	4070	0.000	0.000	0.000	0.000	0.022	0.000	0.022	61.95	0.01
Napranum Aboriginal Shire	48	198	0.000	0.000	0.000	0.000	0.000	0.000	0.000	96.05	0.00
North Burnett Regional	49	1967	3.644	0.000	0.206	0.006	0.028	0.000	3.884	67.18	2.53
Northern Peninsula Area Regional	50	102	0.000	0.000	0.000	0.000	0.007	0.000	0.007	92.25	0.00
Palm Island Aboriginal Shire	51	7	0.000	0.000	0.000	0.000	0.000	0.000	0.000	93.73	0.00
Paroo Shire	52	4761	1.153	0.000	0.000	0.000	0.275	0.001	1.429	52.32	0.93
Porpuraaw Aboriginal Shire	53	438	0.000	0.000	0.000	0.000	0.001	0.000	0.001	77.59	0.00
Quilpie Shire	54	6742	3.746	0.000	0.000	0.000	0.015	0.000	3.761	34.52	2.45
Redland City	55	54	0.006	0.000	0.000	0.097	0.002	0.020	0.126	82.38	0.08
Richmond Shire	56	2658	0.407	0.000	0.000	0.000	0.036	0.000	0.443	38.50	0.29
Rockhampton Regional	57	655	0.742	0.000	0.000	0.002	0.039	0.005	0.789	56.31	0.51
Scenic Rim Regional	58	424	0.105	0.000	0.010	0.000	0.006	0.010	0.131	62.20	0.08
Somerset Regional	59	537	0.301	0.000	0.048	0.004	0.012	0.000	0.364	64.96	0.24
South Burnett Regional	60	838	1.322	0.002	0.141	0.079	0.024	0.000	1.568	54.97	1.02
Southern Downs Regional	61	711	1.811	0.007	0.088	0.003	0.012	0.004	1.924	56.31	1.25

¹ Based on the wooded extent and FPC index V2.3.

² Shires have altered in the de-amalgamation process current as of 1 January 2014, extents and total areas of these shires have changed since last reported.

Table 21 (continued): Woody vegetation clearing by land cover by local government area (2011–12)

Local government area			Rate of woody vegetation clearing (,000ha/yr)							% wooded vegetation cover 2011 ¹	% total clearing in QLD
Name	Map Ref.	Total area (,000ha)	Pasture	Crops	Forest	Mining	Infra-structure	Settle-ment	Total		
Sunshine Coast Regional ²	62	226	0.116	0.000	0.134	0.000	0.008	0.031	0.289	72.86	0.19
Tablelands Regional ²	63	1129	0.133	0.012	0.053	0.001	0.004	0.000	0.204	93.21	0.13
Toowoomba Regional	64	1296	1.005	0.001	0.058	0.009	0.018	0.000	1.090	36.86	0.71
Torres Shire	65	90	0.000	0.000	0.000	0.000	0.000	0.000	0.000	88.59	0.00
Torres Strait Island Regional	66	48	0.000	0.000	0.000	0.000	0.000	0.000	0.000	58.33	0.00
Townsville City	67	373	0.125	0.000	0.000	0.010	0.009	0.187	0.331	68.31	0.22
Weipa Town	68	1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	71.09	0.00
Western Downs Regional	69	3794	7.730	0.075	0.254	0.775	1.385	0.015	10.234	39.45	6.66
Whitsunday Regional	70	2383	3.747	0.050	0.000	0.230	0.034	0.002	4.064	62.15	2.64
Winton Shire	71	5381	0.012	0.000	0.000	0.000	0.008	0.000	0.020	19.72	0.01
Woorabinda Aboriginal Shire	72	39	0.019	0.000	0.000	0.000	0.001	0.000	0.020	71.26	0.01
Wujal Wujal Aboriginal Shire	73	1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	99.29	0.00
Yarrabah Aboriginal Shire	74	16	0.000	0.000	0.000	0.000	0.000	0.000	0.000	98.51	0.00
Douglas Shire ²	75	242	0.004	0.001	0.000	0.000	0.000	0.000	0.005	94.89	0.00
Livingstone Shire ²	76	1170	1.297	0.000	0.196	0.052	0.007	0.002	1.553	70.24	1.01
Mareeba Shire ²	77	5345	0.404	0.055	0.000	0.032	0.021	0.001	0.512	92.56	0.33
Noosa Shire ²	78	87	0.026	0.000	0.018	0.000	0.002	0.009	0.056	74.34	0.04

¹ Based on the wooded extent and FPC index V2.3.

² Shires have altered in the de-amalgamation process current as of 1 January 2014, extents and total areas of these shires have changed since last reported.

Appendix F Missed clearing analysis (1988–2012)

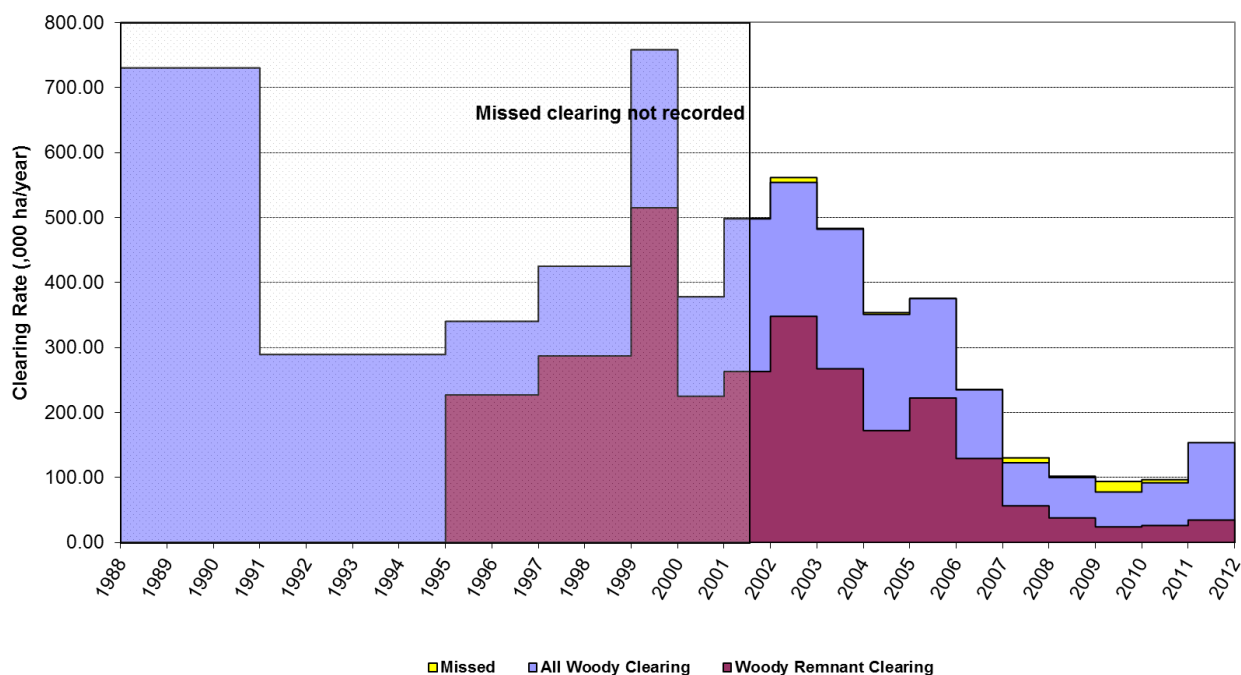


Figure 32: Annual woody vegetation clearing rate in Queensland (1988–2012) with identified missed clearing backfilled¹

¹ Missed clearing is actual area, and has not been converted to ha/year clearing rate.

Table 22: Clearing identified as missed in subsequent era (2001–2011)

	Reported clearing rate (000 ha/yr)	Missed clearing (000 ha) ¹	% of total era clearing
0102	498.0	0.69	0.1%
0203	554.0	7.33	1.3%
0304	482.0	1.26	0.3%
0405	351.0	2.50	0.7%
0506	375.1	0.48	0.1%
0607	234.8	0.45	0.2%
0708	122.8	7.48	5.7%
0809	99.9	1.87	1.8%
0910	77.6	16.34	17.4%
1011	91.7	4.93	5.1%

¹ Missed clearing is actual area, and was not converted to ha/year clearing rate.