Vegetation clearing rates in Queensland

Supplementary report to the Statewide Landcover and Trees Study Report 2012–14

November 2015



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Table of contents

1	Introduction1	1
2	Development of the vegetation management framework1	I
3	Requirements of the framework	2
4	How much clearing is taking place in Queensland?	3
4.1	Change in overall clearing over time	3
5	Where is the clearing taking place?	ł
5.1	Clearing in Great Barrier Reef Catchments	5
6	Trends in vegetation clearing	5
7	Why is vegetation cleared?	5
7.1	2012–13 Summary6	3
7.2	2013–14 Summary	7
7.3	Reasons for clearing in 2012–14	7
8	Exempt clearing	3
8.1	Exempt "Category X" clearing in 2012–14	3
8.2	Exempt "Other" clearing in 2012–14)
9	Clearing under permit)
9.1	Summary 2012–13)
9.2	Summary 2013–14)
9.3	Reasons for trends in permitted clearing11	I
10	Unexplained clearing12	2
11	Carbon dioxide emissions13	3
12	Appendix14	ŀ

Table of figures

Figure 1: SLATS Annual woody vegetation clearing rate in Queensland (1988–2014)*4
Figure 2: SLATS annual woody vegetation clearing rate in Queensland by bioregion (2011–2014)5
Figure 3: Clearing of vegetation subject to the framework in 2012–136
Figure 4: Clearing of vegetation subject to the framework in 2013–147
Figure 5: Clearing rates of woody vegetation subject to the vegetation management framework 2009–2014 8
Figure 6: Total clearing per permit purpose 2012–201310
Figure 7: Total clearing by permit purpose 2013–201411
Figure 8: Self-assessable code notifications 2013–1412
Figure 9: Summary of woody vegetation clearing rates and carbon dioxide emissions in relation to vegetation management framework legislative changes
Figure 10: Annual rainfall from a sample of Queensland weather stations
Figure 11A: Location and size of unexplained clearing events in Queensland 2012-1315
Figure 11B: Location and size of unexplained clearing events in Queensland in 2013-1416
Figure 12: Map of Queensland bioregions17
Figure 13: Map of Queensland bioregions with reef catchment areas and priority reef catchments
areas
Figure 14A: Queensland rainfall 2009-1019
Figure 14B: Queensland rainfall 2010-1119
Figure 14C: Queensland rainfall 2011-1219
Figure 14D: Queensland rainfall 2012-1319
Figure 14E: Queensland rainfall 2013-1420

1 Introduction

The purpose of the *Vegetation Management Act 1999* (VMA) is to regulate the clearing of native vegetation in order to:

- conserve remnant vegetation,
- prevent land degradation and loss of biodiversity,
- maintain ecological processes,
- reduce greenhouse gas emissions, and
- allow for sustainable land use.

The Department of Natural Resources and Mines and the Department of Infrastructure, Local Government and Planning are responsible for implementing the vegetation management framework in a way that allows for sustainable land use while protecting the environmental values of our native vegetation resources.

The management of vegetation in Queensland has changed from a focus of development and expansion of agricultural industries in the early days of statehood to recognition of the need to sustainably manage land. In more recent times, the role vegetation plays in maintaining the health of receiving environments such as the Great Barrier Reef, reducing carbon emissions and maintaining diverse and healthy landscapes has been better understood and appreciated.

The Statewide Landcover and Trees Study Report (SLATS) monitors Queensland's forests and woodlands to assess vegetation extent and clearing activities in relation to the vegetation management framework. Produced by the Department of Science, Information Technology and Innovation, the SLATS reports all areas of land where loss of perennial woody vegetation can be identified using satellite (Landsat) imagery. The findings of SLATS are supported by field verification. Information gathered through the SLATS program has informed the development of the vegetation management framework in Queensland.

The Department of Natural Resources and Mines creates the Supplementary Report to the Statewide Landcover and Trees Study Report (the SLATS supplementary report) to provide guidance about the purposes for which clearing is being undertaken to explain the possible reasons for trends in clearing rates.

2 Development of the vegetation management framework

While clearing on leasehold land had long been regulated in Queensland, clearing controls did not generally exist on freehold land until the commencement of the *Vegetation Management Act 1999* (VMA) in 2000.

Ongoing clearing rates after 2000 resulted in a moratorium on broadscale clearing applications in 2003. In 2004, amendments were made to the VMA to phase out broadscale clearing of remnant vegetation by the end of 2006. At this time, Property Maps of Assessable Vegetation (PMAV) allowing landholders to 'lock-in' vegetation not subject to the vegetation management framework (Category X vegetation) were also introduced. Landholders can apply to have previously cleared vegetation added to Category X areas under a PMAV with the exception of high value regrowth mapped before the PMAV is created. Once certified by the Department of Natural Resources and Mines, clearing can occur in these areas at any time, for any purpose, without the need to seek approval or notify the department.

In October 2009, the vegetation management laws were extended to regulate high-value regrowth vegetation not cleared since 31 December 1989 on freehold land, and all native regrowth vegetation along watercourses in the priority Great Barrier Reef catchments.

Changes to the VMA in November 2011 introduced area management plans into the framework. Area management plans can be prepared by groups of landholders or rural organisations for certain clearing activities such as fodder harvesting, thinning thickened vegetation, weed control and removing encroachment of woody vegetation onto grasslands. Area management plans are approved by the Department of Natural Resources and Mines and are generally developed over a geographic region to address a particular vegetation management issue.

Planning reforms in July 2013 made the then Department of State Development, Infrastructure and Planning responsible for making decisions on development applications for native vegetation clearing while the Department of Natural Resources and Mines' role changed to providing technical advice on development applications assessments.

The vegetation management framework was amended in December 2013 to allow for applications to be made for high-value and irrigated high-value agriculture as well as necessary environmental clearing. Other changes at this time included the introduction of self-assessable vegetation clearing codes, the removal of regulation of high-value regrowth on freehold and Indigenous land, the introduction of the regulated vegetation management map and changes to the development assessment codes.

3 Requirements of the framework

Landholders wanting to clear native vegetation that is subject to the framework must clear under an exemption, obtain a permit, or clear in accordance with an area management plan or self-assessable code.

Exemptions from requiring approval to clear exist for a range of purposes in certain circumstances, including for the:

- construction and maintenance of fire breaks, fences and tracks,
- · removal of imminent risk of personal injury or damage to infrastructure, and
- establishment of minor built infrastructure.

Exemptions also exist to allow clearing for public safety and in emergency situations, and areas contained within Category X (PMAV) areas.

Self-assessable codes apply to a range of activities such as:

- fodder harvesting,
- weed control,
- thinning thickened vegetation,
- clearing of high-value regrowth vegetation, and
- native forest practices (timber harvesting).

Anyone clearing under a self-assessable code is required to follow the practices listed in the code and notify the Department of Natural Resources and Mines before starting. Clearing can also be undertaken on properties covered by an area management plan by following the conditions in the plan. Notification to the Department of Natural Resources and Mines is also required prior to clearing.

For clearing that cannot be undertaken under an exemption, self-assessable code or area management plan, a development approval is required. Development applications are assessed

against the State Development Assessment Provisions which aim to minimise the impacts of clearing on land degradation and environmental values such as:

- watercourses,
- wetlands,
- endangered and of concern regional ecosystems, and
- habitat for threatened species.

4 How much clearing is taking place in Queensland?

The total area of Queensland is approximately 173 million hectares, with approximately 140 million hectares mapped as remnant vegetation, of which 70 million hectares is woody remnant vegetation and fully regulated by the vegetation management framework. The other 70 million hectares of remnant vegetation is not subject to the vegetation management framework as it comprises 60 million hectares of predominantly grasslands and 10 million hectares existing in the protected area estate.

There is approximately 1.9 million hectares previously classified as high-value regrowth vegetation. About 420 000 hectares of high-value regrowth vegetation occurs on state leasehold land and along watercourses in the priority Great Barrier Reef catchments of Burdekin, Mackay-Whitsunday and the Wet Tropics. This vegetation is currently regulated under the vegetation management framework.

The 2012–14 SLATS report shows that the rate of clearing of woody vegetation has been increasing since the 2009–2010 era—from 78 378 hectares per year to 296 324 hectares per year in the 2013–14 period (Figure 1).

As a proportion of the total extent of woody remnant vegetation in Queensland, the reported clearing rates for 2012–13 and 2013–14 equate to reductions in area of 0.085% and 0.147% respectively.

4.1 Change in overall clearing over time

Figure 1 shows a comparison of total woody vegetation clearing over time. An increasing trend is shown in the total rate of vegetation clearing from the 2009–10 reporting period to the 2012–14 reporting period.



Figure 1: SLATS Annual woody vegetation clearing rate in Queensland (1988–2014)*

*Source: Department of Science, Information Technology and Innovation 2015. Land cover changes in Queensland 2012–13 and 2013–14 – Statewide Landcover and Tree Study. HVR in this table means High Value Regrowth both regulated and non-regulated.

The rate of clearing in areas mapped as remnant vegetation has risen by 150% in the three annual periods from the lowest reported clearing rates in 2009–10 to 2012–13. The rate of clearing in areas mapped as non-remnant vegetation has risen by 289% (Figure 1).

The rate of clearing in areas mapped as remnant vegetation has risen by 71% from 2012–13 to 2013– 14, while the rate of clearing in areas mapped as non-remnant vegetation has fallen by 4% over the same period (Figure 1).

Since broadscale clearing was phased out in 2006, the remnant vegetation clearing rate rose by 5% from 2007–08 (the first full SLATS period after the phase-out) to 2012–13 and 79% from 2007–08 to 2013–14.

5 Where is the clearing taking place?

The 2012–14 SLATS report demonstrates a trend of an overall increase in vegetation clearing rates (Figure 1). This chapter highlights where clearing has taken place and identifies trends in each of Queensland's 13 bioregions (Figure 2).

The majority of vegetation clearing in 2012–13 occurred within the Brigalow Belt (55%) and Mulga Lands (27%) bioregions, which jointly accounted for 82% of the total.

The majority of vegetation clearing in 2013–14 occurred within the Brigalow Belt (44%) and Mulga Lands (38%) bioregions, which jointly accounted for 82% of the total clearing during this period (refer to Appendix Figure 12 for a map of Queensland's bioregions).

Together, the Mulga Lands and Brigalow belt bioregions comprise 32% of the total area of Queensland.



Figure 2: SLATS annual woody vegetation clearing rate in Queensland by bioregion (2011–2014)

5.1 Clearing in Great Barrier Reef Catchments

In 2009, changes to the *Vegetation Management Act 1999* introduced regulations for the clearing of high-value regrowth vegetation across the State, as well as regrowth vegetation within 50 metres of watercourses in the priority Great Barrier Reef catchments of the Burdekin, Mackay-Whitsundays and Wet Tropics (Refer to Appendix Figure 13 for a map of priority Great Barrier Reef catchments).

Overall clearing in Great Barrier Reef catchments in both the 2012–13 and 2013–14 periods has increased from 31 330 hectares per year for the 2009-10 period to 109 235 hectares per year and 104 802 hectares per year respectively.

6 Trends in vegetation clearing

Trends identified within the 2012–14 period are likely influenced by environmental, economic and policy considerations.

In general, Queensland experienced above average rainfall between July 2009 and June 2012 followed by below average rainfall between July 2012 and June 2014 (Appendix Figures 14A – 14E). Many western Queensland towns experienced the extremes in rainfall events, recording both their highest and lowest rainfall on record within a five-year span (refer Figure 10).

The increased rainfall can be linked to a proliferation of vegetation growth, particularly in areas that have been previously cleared (re-growth vegetation). It is conceivable that clearing of Category X and regrowth vegetation is likely to be driven by landholders undertaking clearing to remove regrowth vegetation occurring as a result of greater than average rainfall in 2010–11.

From 2012 onwards, more than 80% of Queensland was declared to be in drought. Landholders in western Queensland legitimately sought to clear to harvest mulga to feed their livestock demonstrated by over half of the permitted clearing in remnant vegetation is for fodder purposes.

Legislative changes in December 2013 introduced new broad exemptions for community infrastructure, self-assessable codes, and re-introduced broad-acre clearing for agriculture which had been prohibited since 2006. Because these changes were introduced late in the 2013–14 era, most clearing resulting from these changes will not be detected until the SLATS report for 2014–15 and beyond.

Clearing trends were also likely to be driven by a shift in clearing culture and perceptions brought about by the change in government in 2012. The change in landholder perceptions was supported by a new compliance approach, introduced soon after the change in government in 2012. The Department of Natural Resources and Mines shifted the priority to assisting landholders to undertake clearing rather than the previous priority on assessment and compliance.

7 Why is vegetation cleared?

Clearing under the vegetation management framework can take place for a range of purposes and is authorised under an exemption (including Category X), development permit, self-assessable code or Area Management Plan. Clearing outside Category X areas, or which cannot be readily identified as exempt or permitted from data held by the government, is classified as unexplained clearing. Other clearing includes purposes not captured under the vegetation management framework such as mining and in State forests. Datasets have been used to analyse the clearing within the context of the vegetation management framework, taking into account current vegetation management maps, administrative records, and other spatial information.



7.1 2012–13 Summary

Figure 3: Clearing of vegetation subject to the framework in 2012–13

Most clearing in 2012–13 was of exempt vegetation occurring within Category X areas on a PMAV (74%), which can be cleared at any time, for any purpose. The second largest category was unexplained clearing accounting for 12% of overall clearing and permitted clearing 8% (see Figure 3). The exempt other category accounted for 6% of overall clearing for the period.

7.2 2013–14 Summary



Figure 4: Clearing of vegetation subject to the framework in 2013–14

Most clearing in 2013–14 was also of exempt vegetation occurring within Category X areas on a PMAV (65%), which can be cleared at any time, for any purpose. Clearing under a permit was the second largest category (20%), while a smaller proportion of clearing was unexplained (10%) (see Figure 4).

7.3 Reasons for clearing in 2012–14

Clearing rates detected within the 2012–14 period showed a marked increase in exempt clearing in non-remnant and Category X areas. This increase in clearing can be attributed to a general landholder willingness to invest in property management in response to better cattle prices, management of more rapidly growing regrowth vegetation, and government policy changes regarding priorities in compliance activities. A graph of the woody vegetation clearing by exempt, permitted and unexplained category from 2009–14 has been provided to reflect the clearing of vegetation subject to the framework over time (Figure 7).



Figure 5: Clearing rates of woody vegetation subject to the vegetation management framework 2009–2014

8 Exempt clearing

Exempt clearing is a broad category that captures clearing for a range of purposes across woody remnant and non-remnant vegetation. Clearing classified as exempt can occur without the need for an approval under the vegetation management framework, and includes:

- areas identified as Category X on a Property Map of Assessable Vegetation (PMAV), nonremnant vegetation on the Herbarium regional ecosystem mapping (for 2012–13), and the current Regulated Vegetation Management Map (RVMM) (for 2013–14) where clearing can occur at any time for any purpose;
- clearing under exemptions provided in the vegetation management framework such as for the construction and maintenance of firebreaks, fences, tracks, removing imminent risk, public safety, emergency situations, and for establishing minor built infrastructure; and
- areas and purposes to which the *Vegetation Management Act 1999* does not apply, such as State forests and mining activities.

8.1 Exempt "Category X" clearing in 2012–14

Landholders can apply to show previously cleared vegetation as Category X areas on a PMAV (with the exception of high value regrowth mapped before the PMAV is created). Once a PMAV is certified, clearing can occur in these areas at any time, for any purpose, without the need to seek approval or notify the department.

Clearing in Category X areas was the single largest category of clearing during 2012–13 at 74% of total clearing– Category X PMAV (63%) and non-remnant vegetation on the Herbarium regional ecosystem mapping (11%).

Clearing in Category X area was the single largest category of clearing during 2013–14 at 65% of total clearing–Category X PMAV (50%) and Category X identified on the RVMM (15%).

8.2 Exempt "Other" clearing in 2012–14

Other exempt clearing (not Category X or non-remnant) was identified at 6% in 2012–13 and 5% in 2013–14 of total clearing, although state-wide satellite analysis does not necessarily detect all clearing under small-scale exemptions.

The majority of clearing in this category was reflected in each of the following categories of exempt remnant vegetation clearing:

- Mining, forestry activities in State forest reserves and on freehold land: around 9% of all remnant vegetation clearing in 2012–13 and about 5% of all remnant vegetation clearing in 2013–14.
- Linear clearing, clearing in grassland regional ecosystem communities and clearing on urban land: around 21% of all remnant vegetation clearing in 2012–13 and about 8% of all remnant vegetation clearing in 2013–14.

The reasons for the high proportion of linear clearing detected in the 2012–13 period are unclear. It may be associated with extensive road works undertaken throughout Queensland following extensive flooding in 2010 and 2011 or associated with gas exploration and production. The decrease in proportions of exempt remnant clearing seen in 2013–14 may be explained as a lower rate of linear clearing detected and the increase of permitted clearing in remnant vegetation over this period.

9 Clearing under permit

The vegetation management framework allows for the clearing of vegetation under a permit for a range of purposes. Development permits are administered by the Department of Infrastructure, Local Government and Planning through its State Assessment referral Agency with technical assessment by the Department of Natural Resources and Mines.

In December 2013, two new clearing purposes (high value agriculture and environmental works) were introduced. The December 2013 reforms also saw the introduction of new self-assessable vegetation clearing codes. Fifteen codes are now publically available, allowing landholders to independently comply with clearing requirements without government assessment for the following purposes:

- Fodder harvesting
- Extractive industry
- Necessary environmental works
- Necessary property infrastructure
- Managing weeds
- Managing encroachment
- Managing a native forest practice
- Managing Category C regrowth
- Managing Category R regrowth
- Managing thickened vegetation (there are five locality based codes)
- Improving operational efficiency of existing agriculture

The codes are confined to what was considered lower risk clearing activities that prior to December 2013 would have required a development application to be undertaken. A landholder wishing to clear under a code now need only notify the Department of Natural Resources and Mines of their intention.

Changes to the vegetation management framework in November 2011 introduced area management plans which are generally developed over a geographic region to address a particular vegetation

management issue. Area management plans can be prepared by groups of landholders or rural organisations for certain clearing activities such as fodder harvesting, thinning thickened vegetation, weed control and removing encroachment of woody vegetation onto grasslands and environmental clearing. Eight area management plans have been approved by the Department of Natural Resources and Mines.

Within this report, permitted clearing includes clearing under a development permit, self-assessable code and Area Management Plans.

9.1 Summary 2012–13

Permitted clearing accounted for 8% of the total clearing detected in 2012–13 (Figure 3).



Figure 6: Total clearing per permit purpose 2012–2013

Harvesting for fodder was the most widespread type of clearing in 2012–13 accounting for 35% of the total clearing (Figure 6). The second largest category was clearing for multiple purposes (23%). This include multiple clearing categories detected within a single lot.

The high proportion (16%) of agricultural and grazing lease permits seen in 2012–13 comes as a result of the legislative environment prior to April 2009. At this time, a clearing permit was required to clear high value regrowth vegetation on leasehold lands. Permits were issued for 5 years and the result of this clearing is still being detected by SLATS.

9.2 Summary 2013-14

Harvesting for fodder remained the most widespread type of clearing in 2013–14 accounting for 57% in 2013–14 (Figure 7). The second largest clearing category was detected on lots with multiple permit purposes (23% 2013–14).



Figure 7: Total clearing by permit purpose 2013–2014

9.3 Reasons for trends in permitted clearing

Below average rainfall between July 2012 and June 2014 is likely to be the reason for increased clearing rates during the dry years. This increased clearing is shown by the high proportion of clearing for the harvesting of fodder to feed livestock. Harvesting of fodder was permitted under self-assessable code, development permit and Area Management Plans.

Multiple clearing purposes were largely attributed to a combination of clearing types permitted under Area Management Plans to manage property maintence activities such as encroachment, fodder and thinning. In July 2012, the Department of Natural Resources and Mines released a number of Area Management Plans for Western regions including Moonjaree, Mulga Lands and South West Queensland in response to drought pressures being experienced. These Area Management Plans allow landholder to clear for fodder harvest without requiring a development permit and the clearing is exempt when carried out in accordance with the plan. The most common combination of clearing types under Area Management Plans include fodder, thinning, and weed and pest management.

This change in government policy that encouraged landholders to manage compliance themselves without direct government involvement may itself have encouraged more landholders to invest in business expansion and management activities than would have under the previous development approval regulations.



Figure 8: Self-assessable code notifications 2013–14

Self-assessable code notifications are received by the Department of Natural Resources and Mines however they may not necessarily result in clearing. Figure 8 represents the total numbers of lots with self-assessable code notifications, corresponding with detected areas of clearing within the 2013–14 period. The self-assessable code only came into effect in December 2013 and therefore the findings of this report represent the first six months of operation.

Native Forest Practice dominated the greatest proportion of code notifications received by the department. The vegetation management framework provides for the sustainable harvest of native vegetation to occur on freehold without the need for an approval. Landholders only need to notify the department of any native forest practice, and conduct the activity in compliance with the code.

10 Unexplained clearing

Woody vegetation clearing outside Category X areas, or which cannot be identified as exempt or permitted, is classified as unexplained clearing. Unexplained clearing is not necessarily illegal clearing. Initial satellite image analysis at a state scale does not always determine the exact nature of some clearing. Without further analysis, it can be difficult to determine if clearing is exempt or unlawful. For this reason, unexplained clearing is prioritised for property scale analysis to determine its exact nature. Where unlawful clearing is suspected, the Department of Natural Resources and Mines may take compliance actions ranging from advice and warning letters through to restoration and prosecution.

Of the total woody vegetation clearing in 2012–13, 12% was unexplained. Forty-four unexplained clearing events where clearing exceeded 100 hectares were detected in 2012–13, compared to 12 such events in 2009–10 (refer to Appendix Figure 11A).

Unexplained woody vegetation clearing in 2013–14 totalled 10%. Forty-two unexplained clearing events where clearing exceeded 100 hectares were detected in 2013–14 (refer to Appendix Figure 11B).

The Brigalow Belt bioregion recorded the greatest proportion of unexplained clearing with 55% of clearing unexplained in in 2012–13 and 62% unexplained in 2013–14.

11 Carbon dioxide emissions

Between 2002–03 and 2009–10, estimated carbon dioxide emissions from vegetation clearing in Queensland fell from 60 Megatonnes (Mt) to 15.7 Mt, a 75% reduction of approximately 44¹ Mt (Figure 9).

In the 2007–08, 2008–09 and the 2009–10 periods, emission rates for clearing vegetation decreased proportionally more than clearing rates. This is due to the fact that areas cleared each year are made up of a diversity of vegetation types which vary in the amount of carbon that they store.

Carbon emissions increased from 16 Mt in 2009–10 to 27.6 Mt in 2012–13, a 42% increase of 11.6 Mt. In 2013–14 carbon emissions increased from 27.6 Mt in 2012–13 to 35.8 Mt in 2013–14, a 23% increase of 8.2 Mt.



Figure 9: Summary of woody vegetation clearing rates and carbon dioxide emissions in relation to vegetation management framework legislative changes.

 $C0_2$ calculations for the 2012–13 and 2013–14 periods are based on SLATS preliminary carbon estimates. 2012–14 SLATS did not include estimates of emissions. Generally, a comparison of the carbon emission of previous eras indicates a general trend towards increasing carbon emissions in line with the increase in overall clearing rates between 2012–14.

¹ Emissions calculated from the National Carbon Accounting System (NCAS) are likely to differ from SLATS estimates because of different methodologies and estimates of areas cleared. In addition, NCAS calculates carbon flows from other sources such as vegetation decay, soil carbon changes and carbon stored in new regrowth, and accounts for delayed emissions. SLATS emission calculations are based solely on cleared biomass.

12 Appendix



Figure 10: Annual rainfall from a sample of Queensland weather stations



Figure 11A: Location and size of unexplained clearing events in Queensland 2012-13



Figure 11B: Location and size of unexplained clearing events in Queensland in 2013-14



Figure 12: Map of Queensland bioregions



Figure 13: Map of Queensland bioregions with reef catchment areas and priority reef catchments areas.



Figure 14A: Queensland rainfall 2009-10



Figure 14B: Queensland rainfall 2010-11







Figure 14D: Queensland rainfall 2012-13



Figure 14E: Queensland rainfall 2013-14