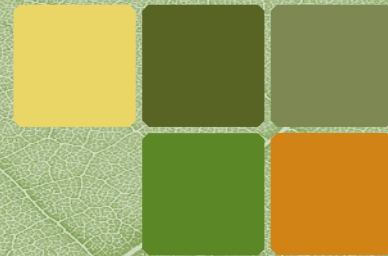


# NSW Report on Native Vegetation 2011–13



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## 1 Overview

The NSW Report on Native Vegetation 2011–13 provides a comprehensive picture of the status of the regulation, protection and extent of native vegetation and includes the following:

- *Native Vegetation Report Card 2011–13*, which provides information on the conservation, restoration, management and approvals for clearing native vegetation, including approvals for clearing under property vegetation plans (PVPs).
- *Private Native Forestry Report 2011–13*, which provides information on the number and area of private native forestry (PNF) PVPs.
- *Woody Vegetation Change Report Card 2010–11*, which provides a summary of losses in woody vegetation extent as a result of agriculture, infrastructure, forestry and bushfire. This is the first report containing SPOT5 satellite imagery analysis data.
- *Compliance and Enforcement Report Card 2011–13*, which reports on compliance and enforcement activities under the Native Vegetation Act 2003 (NV Act).

The report is now provided by financial year to align with other reporting timeframes. All of the available data from previous years is included in the current report.

The *Native Vegetation Report Card* shows that, in the 2012–13 financial year, 2140 hectares of native vegetation across NSW were approved to be cleared. Environmental values were maintained or improved through offsetting any impacts. Over 300,000 hectares of native vegetation were conserved or improved across the state in the 2012–13 period.

The *Private Native Forestry Report* shows that in the 2012–13 financial year, 353 PNF PVPs were approved so that 61,188 hectares of native forest could be sustainably logged in accordance with the PNF Code.

The *Woody Vegetation Change Report Card* displays Landsat5 and new SPOT5 data for the period of 2010–11. Landsat has a resolution of 30 metres and is able to detect woody vegetation with a crown cover of greater than 20 per cent or more. SPOT5 has a higher resolution of 5 metres and is able to detect woody vegetation with a crown cover of 5 per cent.

Based on SPOT5 data analysis, the area of woody vegetation was reduced by 29,900 hectares (0.04 per cent of the area of the state) from the extent measured in 2009–10. This was as a result of forestry; clearing for cropping, pasture and thinning; fire; and rural and major infrastructure.

- The rate of clearing declined in 2010–11 by about 40 per cent compared to 2009–10, probably because of the wet conditions.
- The report shows that clearing for agriculture in 2010–11 was 5400 hectares (this includes clearing under previously approved PVPs), about 35 per cent less than 2009–10
- Clearing for rural and major infrastructure in 2010–11 was 2300 hectares, about 23 per cent less than in 2009–10.
- The clearing in 2010–11 resulting from bushfires was 4900 hectares, about 70 per cent lower than in 2009–10.
- Clearing for all forestry in 2010–11 was 17,300 hectares. This was 3500 hectares less than in 2009–10. Of this, about 80 per cent was in state forest and 20 per cent was on freehold or leasehold land.
- While the Landsat5 data totals are different from the SPOT5 data, they follow the same trends. The Landsat5 data is included in the report for comparison with SPOT5 data.

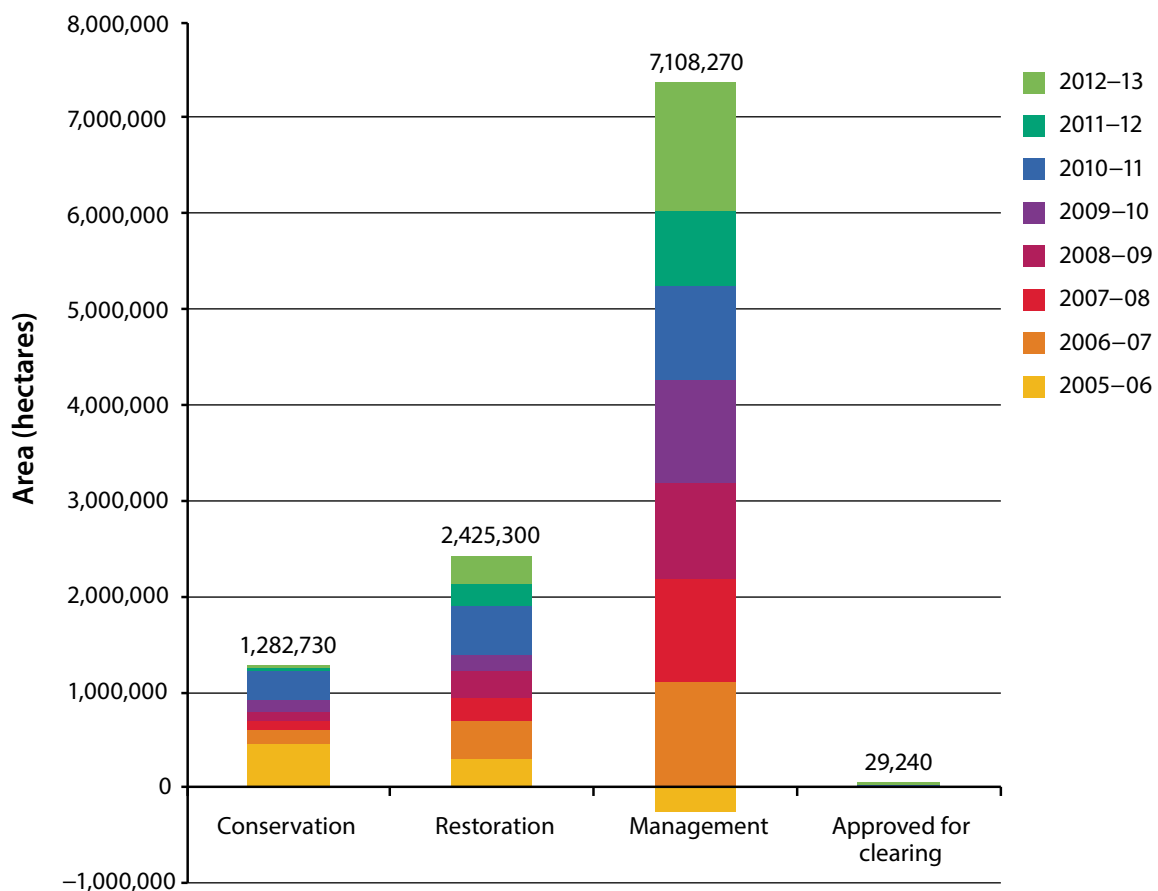
The *Compliance and Enforcement Report Card* shows that in the 2012–13 financial year, OEH commenced three prosecutions under native vegetation legislation and secured two convictions. OEH also issued ten penalty notices, ten remedial directions and 154 formal warning and advisory letters.

## 2 Native Vegetation Report Card

The *Native Vegetation Report Card* provides the latest information on the conservation, restoration, management and approvals for clearing native vegetation. Data from 2005–06 to 2011–12 financial year periods are also shown for comparison (Figures 2.1 and 2.2, and Table 2.1). The statistics do not include clearing carried out under exemptions or alleged illegal clearing.

The native vegetation statistics have been gathered through a collaborative effort between NSW natural resource agencies such as the Office of Environment and Heritage (OEH), Local Land Services (formerly catchment management authorities), the Department of Primary Industries (DPI), Nature Conservation Trust (NCT), and Forestry Corporation of NSW. They do not include data from other agencies or external organisations.

**Figure 2.1** Cumulative area of native vegetation that has been conserved, restored, managed or approved for clearing between July 2005 and June 2013.



## Data category description

(All data is from OEH sources unless otherwise stated.)

### New conservation areas

- **Public reserve system – national park estate.** New national parks, nature reserves and state conservation areas, or additions to national parks, nature reserves and state conservation areas.
- **Public reserve system – flora reserves.** Data from Forestry Corporation of NSW.
- **Private conservation areas – conservation agreements.** Areas of new conservation agreements established under s.69A-KA of the *National Parks and Wildlife Act 1974*. These are binding on current and successive owners and are held in perpetuity.
- **Private conservation areas – NCT covenants.** Nature Conservation Trust (NCT) covenants that protect properties with high conservation values. Properties are either acquired by the NCT then sold with covenants in place, or covenants are negotiated with existing landholders.
- **Private conservation areas – NCT revolving fund properties held for sale.** High conservation value areas on properties purchased by the NCT. The areas are managed for conservation, until the properties are sold with conservation covenants in place.
- **Private conservation areas – wildlife refuges.** Areas of new wildlife refuges under the *National Parks and Wildlife Act 1974*. These areas are managed for conservation of wildlife habitat.
- **Private conservation areas – PVPs in perpetuity.** Property Vegetation Plans (PVPs) protecting areas of native vegetation in perpetuity, including Conservation PVPs and some Incentive PVPs.
- **Private conservation areas – BioBanking agreements.** The Biodiversity Banking and Offsets Scheme (BioBanking) protects and improves biodiversity and, after landowners have sold their biodiversity credits, provides annual management payments in perpetuity.
- **Private conservation areas – s.88 conservation covenants.** Areas of new conservation covenants created during the conversion of leasehold land to freehold land in the Central and Eastern Division and managed by DPI under s.88B of the *Conveyancing Act 1919*. This data set is no longer being updated. It is included for historical reference.

### New restoration/revegetation of native vegetation

- **Incentive PVPs not in perpetuity.** Area of revegetation or restoration of native vegetation as set out in an incentive PVP (excluding Incentive PVPs in perpetuity).
- **PVP offsets.** Area of offsets negotiated in a PVP. Offsets are actions that a landholder agrees to in order to balance negative impacts of clearing.
- **Native plantations.** Plantable area includes plantations of native species only.  
Sourced from DPI.
- **Revegetation through other incentives (non-PVP).** Revegetation activities conducted by CMAs through funding sources other than PVPs.  
Sourced from CMAs.
- **Retained as a condition of approval to clear – P&R Act 1999 and NVC Act 1997.** Area of land retained as a condition of clearing consent, includes vegetation clearing approvals and plantation authorisations under the *Plantations and Reforestation Act 1999* and the *Native Vegetation Conservation Act 1997*.  
Sourced from OEH and DPI.
- **Wildlife refuges – habitat modified and restored.** Areas integrating conservation into other land use activities, which also provides wildlife habitat, e.g. grazing on native unimproved grasslands/rangelands/woodlands under the *National Parks and Wildlife Act 1974*.

## New management of native vegetation

- **Invasive native scrub PVPs.** Area authorised under a PVP to manage invasive native scrub, the term used to describe native plant species that have spread rapidly within their natural range.
- **Thinning to benchmark PVPs.** Area of land to be cleared to improve the quality of the vegetation using thinning provisions of the Environmental Outcomes Assessment Methodology.
- **Public forest estate.** Area of new state forest, or the reduction of state forest through the conversion to national park estate.  
Data supplied by Forestry Corporation of NSW.
- **Private native forestry on state protected land.** Areas of native forest on state protected land approved for timber harvesting and silviculture that does not significantly degrade native forests.
- **Private native forestry PVPs.** Area under a PVP for timber harvesting and often silviculture within a native forest. The PNF Code of Practice commenced operation in August 2007.
- **Improved rangeland management.** Improvement of native vegetation through management and incentive projects. Projects include the control of grazing pressure by feral goats and domestic stock through fencing or controlling access to water.  
Sourced from CMAs.
- **Weed removal programs.** Area of land to be cleared of exotic weeds for environmental improvement.  
Sourced from OEH and CMAs.

## New clearing of native vegetation

- **Clearing PVPs approved where environmental outcomes maintained or improved.** Area of land where clearing approved under a PVP (includes broadscale and paddock tree clearing) will 'improve or maintain' environmental outcomes. The impact of clearing is measured against four environmental values: water quality, soils, salinity and biodiversity (including threatened species).
- **Clearing under NVC Act.** Area approved for clearing under the *Native Vegetation Conservation Act 1997*.
- **Clearing under P&R Act.** Area of land approved for clearing under the *Plantations and Reafforestation Act 1999*.  
Sourced from DPI.
- **Clearing under local government RAMAs.** Area of land permitted for clearing under the *Native Vegetation Act 2003* as routine agricultural management activities (RAMAs), for essential local government infrastructure.
- **Clearing for increased infrastructure RAMA buffers.** Area of land permitted for clearing above the prescribed buffer distances outlined in the *Native Vegetation Regulation 2005*.

**Figure 2.2** Area of native vegetation that has been conserved, restored, managed or approved for clearing between July 2005 and June 2013.



Note: The graphs have different scales. For a detailed breakdown of the figures, refer to Table 2.1. Property Vegetation Plan (PVP) assessments commenced 1 December 2005. The clearing data for the 2005-06 period represents clearing approvals under the rescinded NVC Act up until December 2005 and clearing approvals under the current NV Act after December 2005.

## Data sources

All data are from OEH sources unless otherwise stated. Information was collected on BioBanking on 20 August 2013. Data was taken from the application database PADACS (PVPs, agreements, data and customer service) on 20 August 2013. Information was collected from the public reserve system on 3 September 2013 and private conservation areas (conservation agreements and wildlife refuges) on 9 September 2013. CMAs provided data from 31 July to 18 September 2013. DPI provided information on plantations on 20 September 2013. NCT provided information on 9 October 2013. Forestry Corporation of NSW provided data on 22 October 2013. PNF PVP data was extracted from the data provided in the PNF Report Card.

**Table 2.1** Area of native vegetation that has been conserved, restored, managed or approved for clearing between July 2005 and June 2013.

New conservation areas	Area (hectares)							
	2005–06	2006–07	2007–08	2008–09	2009–10	2010–11	2011–12	2012–13
Public reserve system – national park estate	420,400	155,260	71,780	42,860	39,120	314,370	5,860	9,010
Public reserve system – flora reserves	0	0	2,730	0	0	0	0	0
Private conservation areas – conservation agreements	17,050	3,820	2,200	29,660	74,770	6,550	5,810	3,170
Private conservation areas – NCT covenants	<10	0	170	820	1,280	360	1,020	1,520
Private conservation areas – NCT revolving fund properties held for sale	0	2,750	2,730	11,210	120	3,780	140	0
Private conservation areas – wildlife refuges	18,540	150	1,250	-110	150	30	470	160
Private conservation areas – PVPs in perpetuity	not available	not available	2,990	2,530	5,370	3,900	4,540	9,270
Private conservation areas – BioBanking Agreements	–	–	–	0	80	190	1,710	1,190
<b>TOTAL (ha)</b>	<b>455,990</b>	<b>161,980</b>	<b>83,850</b>	<b>86,970</b>	<b>120,890</b>	<b>329,180</b>	<b>19,550</b>	<b>24,320</b>
Private conservation areas – s.88 conservation covenants	4,260	7,820	27,460	63,400	329,990	434,110	156,710	not available

New restoration/revegetation of native vegetation	Area (hectares)							
	2005–06	2006–07	2007–08	2008–09	2009–10	2010–11	2011–12	2012–13
Incentive PVPs not in perpetuity	19,690	66,370	165,820	111,130	110,730	150,720	112,790	16,210
PVP offsets	1,080	4,740	6,020	3,210	11,150	19,070	8,360	6,690
Native plantations	9,920	15,890	32,250	11,450	10,580	3,530	6,550	1,400
Revegetation through other Incentives (non-PVP)	76,170	313,550	13,350	151,910	37,750	340,980	110,910	252,370
Retained as a condition of approval to clear – P&R Act 1999 and NVC Act 1997	6,290	6,930	13,350	1,610	420	110	10	560
Wildlife refuges – habitat modified and restored	190,250	2,270	990	-30	-840	390	600	50
<b>TOTAL (ha)</b>	<b>303,400</b>	<b>409,750</b>	<b>231,780</b>	<b>279,280</b>	<b>169,790</b>	<b>514,800</b>	<b>239,220</b>	<b>277,280</b>

New management of native vegetation	Area (hectares)							
	2005–06	2006–07	2007–08	2008–09	2009–10	2010–11	2011–12	2012–13
Invasive native scrub PVPs	41,160	509,950	588,680	359,010	673,300	504,040	632,340	433,000
Thinning to benchmark PVPs	10	850	360	510	780	530	50	2,770
Public forest estate	-354,220	-3,270	-11,430	-4,470	770	-146,650	-90	-240
Private native forestry on state protected land	49,310	17,340	5,440	0	0	0	0	0
Private native forestry PVPs	–	–	89,690	142,880	66,940	79,690	72,170	61,190
Improved rangeland management	not available	286,730	228,950	300,280	96,480	176,910	72,390	232,380
Weed removal programs	940	304,910	155,650	225,960	236,040	349,670	8,750	619,840
<b>TOTAL (ha)</b>	<b>-262,800</b>	<b>1,116,510</b>	<b>1,057,340</b>	<b>1,024,170</b>	<b>1,074,310</b>	<b>964,190</b>	<b>785,610</b>	<b>1,348,940</b>

New clearing of native vegetation	Area (hectares)							
	2005–06	2006–07	2007–08	2008–09	2009–10	2010–11	2011–12	2012–13
Clearing PVPs approved where environmental outcomes maintained or improved	40	380	1,740	2,590	2,650	3,260	1,300	2,130
Clearing under NVC Act 1997	13,430	500	10	0	0	0	0	0
Clearing under P&R Act 1999	210	340	500	130	10	10	0	0
Clearing under local government RAMAs	–	–	0	<10	<10	<10	0	10
Clearing for increased infrastructure RAMA buffers	–	<10	0	<10	<10	0	<10	0
<b>TOTAL (ha)</b>	<b>13,680</b>	<b>1,220</b>	<b>2,250</b>	<b>2,720</b>	<b>2,660</b>	<b>3,270</b>	<b>1,300</b>	<b>2,140</b>

**Note:** The 2005–06 data for the category 'Revegetation through other incentives (non-PVP)' only includes January–June 2006 data. The 2005–06 to 2009–10 wildlife refuge data is derived from other data, as actual figures are unavailable. Previous calendar year data has been re-categorised into financial year data.

The figures have been rounded up or down to the nearest 10 hectares.

PVP = property vegetation plan; RAMAs = routine agricultural management activities.

The section 88 conservation covenant dataset is no longer being updated. It is included for historical reference.

### 3 Private Native Forestry Report

Private native forestry (PNF) is the management of native vegetation on privately owned land for the purpose of obtaining forest products on a sustainable basis. There are an estimated 8.5 million hectares of native forests on private land across NSW.

The PNF Code of Practice (the Code), which sets minimum operating standards for harvesting in private native forests, was introduced on 1 August 2007 to ensure that forest operations improve or maintain environmental outcomes and encourages sustainable management of forestry on private land. Until 2007, PNF had been a largely unregulated industry in NSW. Only forestry operations on state-protected land required approval prior to the introduction of the Code (approximately 20 per cent of all PNF activity). The introduction of the Code means that 100 per cent of the industry is now regulated.

Approval through a private native forestry property vegetation plan (PNF PVP) is required to carry out forestry operations on private land. A PNF PVP is a legally binding agreement between a landholder and the EPA. PNF PVPs are valid for up to 15 years, giving landowners the security they need to make long-term forest management decisions.

Between 1 August 2007 and 30 June 2013, 2637 PVPs have been approved for PNF, covering 512,564 hectares of private forest. The EPA approved 353 new PNF PVPs in 2012–13 covering 61,188 hectares.

**Table 3.1** Area of PNF PVPs approved between August 2007 and June 2013.

Forest type	Area of PNF PVP (ha)						Total
	2007–08	2008–09	2009–10	2010–11	2011–12	2012–13	
Northern NSW	63,845	92,390	54,727	58,490	58,730	43,200	<b>371,382</b>
Southern NSW	4,425	4,943	3,804	5,830	3,093	4,243	<b>26,338</b>
River Red Gum	18,394	37,367	4,506	11,860	4,664	10,047	<b>86,838</b>
Cypress and Western Hardwood	3,029	8,184	3,906	3,511	5,678	3,698	<b>28,006</b>
<b>Totals</b>	<b>89,693</b>	<b>142,884</b>	<b>66,943</b>	<b>79,691</b>	<b>72,165</b>	<b>61,188</b>	<b>512,564</b>

#### Compliance and enforcement activities

The EPA is implementing a PNF monitoring and compliance strategy, and undertaking operational inspections, audits and investigations. This is supported by education, training and extension activities. During 2012–13, the EPA undertook 130 operational inspections and 123 audits of PNF operations. Five new compliance investigations were being carried out. During 2012–13, 11 warning letters, 36 advisory letters and 12 corrective action requests were issued. Eighteen reports about non-compliance or unauthorised PNF operations were received by the OEHL and the EPA during the year and all reports were investigated. Approximately 23 notifications were received in 2012–13.



## Training campaigns, educational DVDs and video clips

The PNF training program aimed to train landholders and logging contractors on how to comply with the Code, by focusing on the protection of biodiversity and cultural values of forests, improving forest management and harvesting techniques, soil and water protection, and work health and safety (WHS) standards. Its overarching goal is to facilitate a shift towards sustainable PNF in NSW.

In 2012–13, the EPA released a series of DVDs and video clips for landholders, contractors and other stakeholders interested in PNF. These will assist landholders and contractors to protect the environment and forest health during PNF operations. They build on the positive feedback received from people who attended the PNF training courses held in 2012–13 and earlier.

The PNF DVDs and video clips are presented in two series. The introductory series provides an overview of PNF, and covers the approval process and forest management practices to protect the environment and improve forest productivity. The technical series builds on the concepts in the introductory series, providing in-depth technical information to help landholders and harvesting contractors in applying the Code.

The video clips, along with an explanatory brochure can be found on the EPA website at [www.epa.nsw.gov.au/pnf/trainingvideos.htm](http://www.epa.nsw.gov.au/pnf/trainingvideos.htm).

## 4 Woody Vegetation Change Report Card 2010–11

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This Woody Vegetation Report Card is the sixth to be provided on the annualised change in woody vegetation in NSW since the implementation of the NV Act. Previous reports have included measurements of woody vegetation change based on analysis of Landsat5 imagery. It has not been possible to continue the annual Landsat based monitoring beyond 2010–11 due to the failure of Landsat5 in November 2011 and the delay in launching Landsat8, which commenced operations in June 2013. A high-resolution monitoring program based on SPOT5 satellite imagery has been in development since 2008 and the first results from that program are included in this report. This report includes information on the total reduction in the area of woody vegetation in NSW for the annual periods 2009–10 and 2010–11. The high resolution (SPOT5) monitoring program will provide information regarding the 2011–12 period and beyond in future reports.

The new figures based on SPOT5 imagery and the previously reported annualised woody vegetation change rates (Landsat) for periods between 1988 and 2011 are included in the report for comparison. This report covers losses in woody vegetation due to clearing for agriculture, forestry and infrastructure activities. It also reports losses in woody vegetation resulting from bushfires. The report does not identify gains or increases in woody vegetation due to planting and natural regrowth.

Woody vegetation for the purpose of previous reports was defined as woody communities with 20 per cent crown cover or more (e.g. woodlands, open forests and closed forests) which are taller than about 2 metres. It includes both native and exotic species. The 5-metre resolution SPOT5 imagery is a synthesis of the SPOT5 2.5-metre and 10-metre images, and provides more detailed mapping than Landsat5, detecting woody vegetation down to 5 per cent crown cover when compared at the Landsat5 30-metre resolution. Due to this resolution difference, the change rates will be different. The reasons are explained in the comparison of SPOT5 and Landsat5 woody vegetation change section below. Use of SPOT5 imagery has enabled the detection of woody vegetation change in landscapes such as open woodlands with scattered trees, grasslands and highly modified areas that were unable to be detected with Landsat5 imagery.

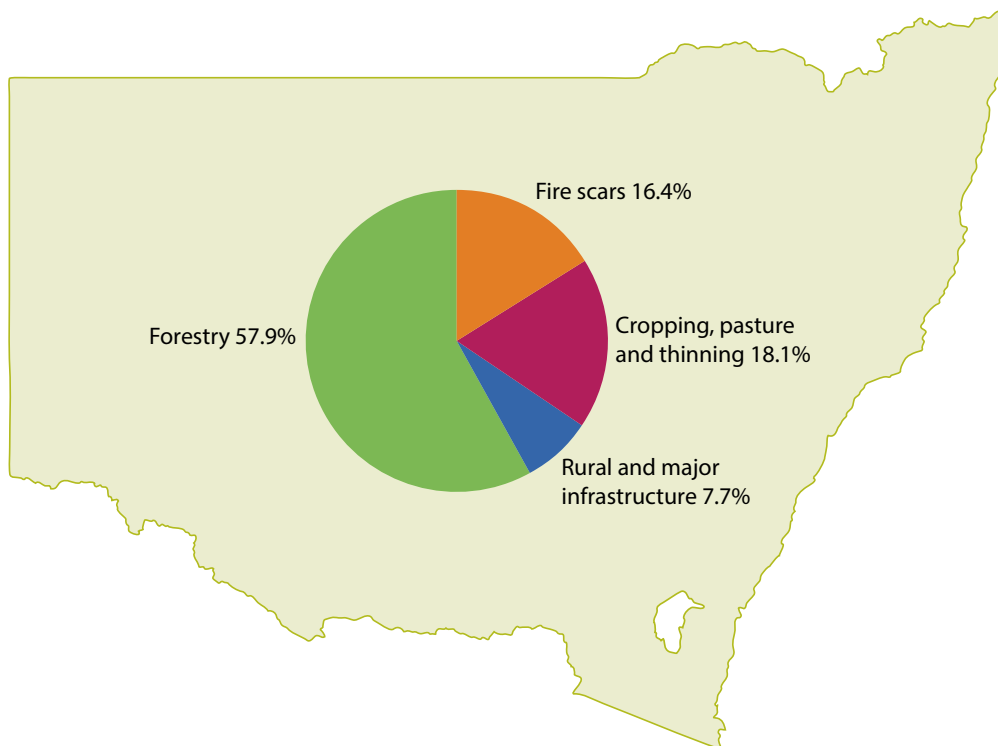
Approximately 320 SPOT5 scenes covering NSW were analysed using the SLATS automated processing methods (state-wide landcover and trees study). This image analysis was done to a 5-metre resolution. Following this, the woody vegetation data from the automated process was visually edited to ensure a high level of accuracy and consistency. This interpretation of the change analysis was done by nine regionally based interpreters with local expertise. During the validation stage, all interpretation of change was cross checked by independent image interpreters.

The data in this report cannot be compared to the *Native Vegetation Report Card* because that report deals with native vegetation only rather than exotic and native vegetation. Further, the PVP process allows up to 15 years for the clearing to take place so approval may be in one year and clearing in another and thus cannot be directly connected with clearing figures. The *Native Vegetation Report Card* does **not** report on activities exempt or excluded from the NV Act.

The forestry woody vegetation change data in Table 4.2 is the result of a GIS analysis using woody change, tenure and Australian Collaborative Land Use and Management Program (ACLUMP) land use data. This land use data was based on imagery sources acquired during 1999–2006. The classification of forests into plantation, native, pine and hardwood is solely based on this land use data. Hence, the rates in Table 4.2 will be influenced by the accuracy and currency of the land use data. This detailed breakdown of the forestry activities cannot be undertaken for the years prior to 2006–07.

A small percentage (approximately 1.3 per cent) of the total NSW area was not interpreted in the 2010–11 period due to cloud cover in the imagery used.

**Figure 4.1** Relative proportion of woody vegetation clearing 2010–11 by land use category and fire.



The current methodology only measures decrease in woody vegetation cover. It is recognised that there are areas where the woody vegetation cover is increasing, in particular within forestry areas. The increase in woody vegetation cover is more difficult to quantify over a short time-frame such as the 12-month annualised period covered by this report.

An analysis of woody vegetation change over NSW for the period 2010–11 calculated the annual reduction in woody vegetation as 29,900 hectares (or 0.04 per cent of the area of NSW). Figure 4.1 shows the proportion of clearing by land use and fire category. The measured woody vegetation loss rates for all periods are shown in Table 4.1 and in Figure 4.2.

**Table 4.1** Rate of woody vegetation loss annualised by land use category and fire over the period 1988–2011 (ha/year), for SPOT5 and Landsat5 analyses.

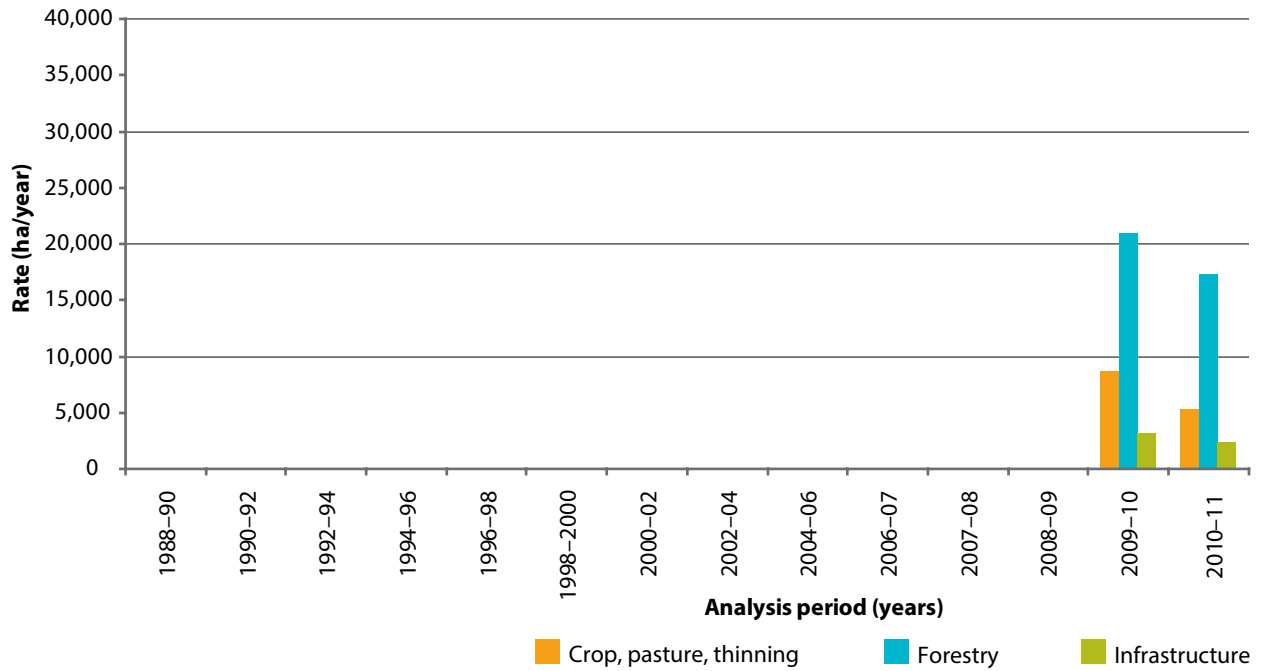
SPOT5	1988–1990	1990–92	1992–94	1994–96	1996–98	1998–2000	2000–02	2002–04	2004–06	2006–07	2007–08	2008–09	2009–10	2010–11
Crop, pasture, thinning													8,600	5,400
Forestry													20,800	17,300
Infrastructure													3,000	2,300
Fire													17,300	4,900

Landsat	1988–1990	1990–92	1992–94	1994–96	1996–98	1998–2000	2000–02	2002–04	2004–06	2006–07	2007–08	2008–09	2009–10	2010–11
Crop, pasture, thinning	30,900	21,000	15,800	21,800	21,200	13,700	20,100	27,500	16,100	17,700	16,100	18,500	21,200	6,600
Forestry	8,800	7,000	10,400	6,900	15,700	13,000	19,400	17,200	9,600	19,200	24,000	31,300	42,700	26,600
Infrastructure	2,900	2,900	2,700	2,200	5,100	3,800	4,500	3,500	1,900	3,800	4,000	6,200	5,300	2,300
Fire	1,300	6,500	4,900	6,200	7,600	19,700	33,600	102,800	3,700	20,2400	4,200	8,200	48,300	3,900

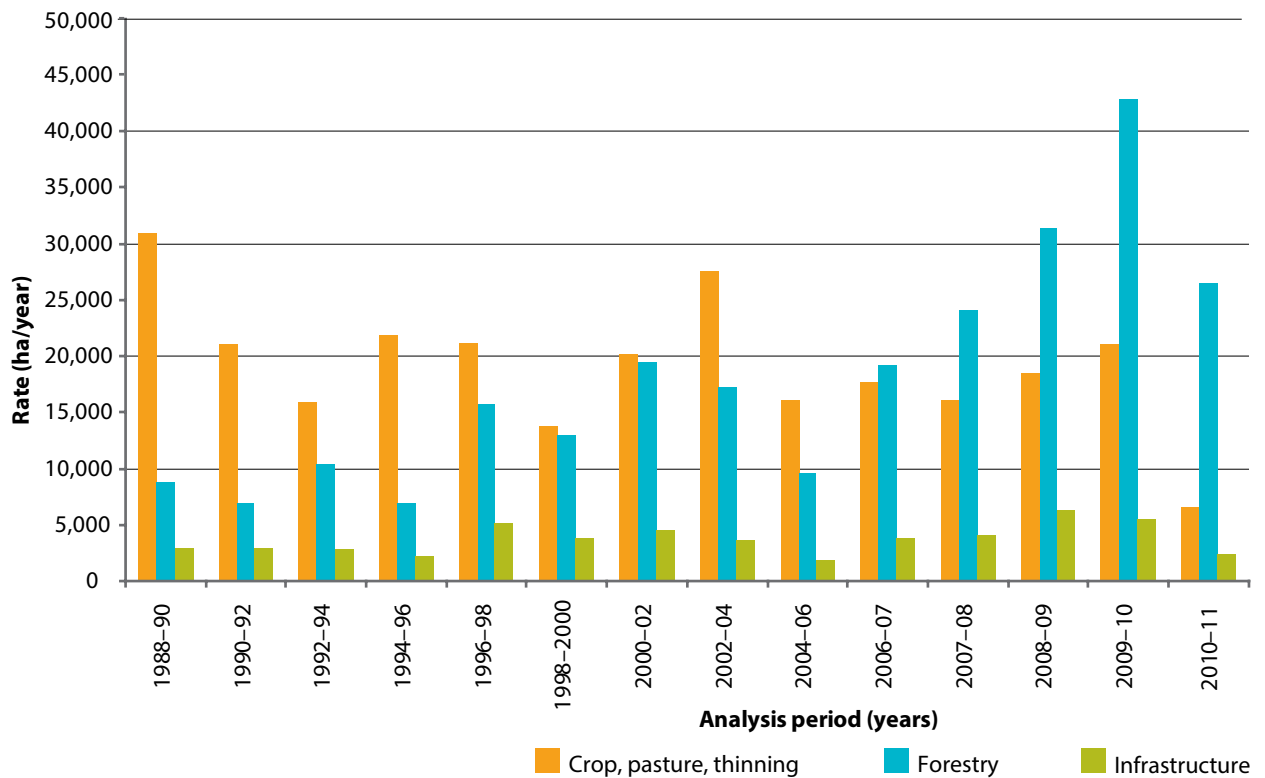
**Note:** The periods of analysis for the figures in Table 4.1 and Figure 4.2 cover either a 1- or 2-year timeframe. The figures shown are annualised rates to enable relative 'annual' comparisons to be made between all periods. Rates are rounded to the nearest 100 ha.

**Figure 4.2** Annual loss of woody vegetation 1988–2011 by land use categories for SPOT5 and Landsat analyses.

**SPOT5**



**Landsat**



**Note:** The information shown in Figure 4.2 reflects the predominant woody vegetation loss as a result of human activity. Changes due to fire have not been included in the graph as the fire-affected vegetation usually regrows quickly and the very large size of the fire scars can dominate the graph to a degree that makes it difficult to display the rates in a meaningful way.

## Patterns of change

Changes in woody vegetation continue to occur across NSW. Based on SPOT5 analysis, the major changes occur in the following categories:

### Cropping, pasture and thinning

This category includes areas where the woody canopy cover was reduced as a result of clearing for cropping, pasture or thinning.

The rate of clearing across the state decreased in the 2010–11 period by 37 per cent compared to the 2009–10 period.

### Forestry

This category includes areas where the woody canopy has been reduced due to forest harvesting activities. This includes PNF, harvesting within state forests and harvesting within plantations.

Forestry harvesting activities account for 58 per cent of the total woody vegetation reduction in the 2010–11 period (Table 4.1). In this report, additional analysis has enabled the division of woody loss due to forestry into categories based on the tenure and management practice. These woody vegetation loss rates are presented in Table 4.2. The main points are:

- The forestry activity was widespread over the eastern third of the state.
- 19 per cent of woody vegetation reduction occurred on freehold or leasehold tenure.
- Native forest harvesting in state forest tenures has fallen by 36 per cent in the 2010–11 period compared to the 2009–10 period.
- Within the forestry change category, 64 per cent of woody vegetation change was in plantations and 36 per cent was in native forests.

It should be noted that forest re-establishment usually occurs in the areas subjected to forest harvesting.

**Table 4.2** Rates of woody vegetation change for forestry land use by tenure and management practice over the period 2006–11 (ha/year) by SPOT5 and Landsat5 analyses

SPOT5		2006–07	2007–08	2008–09	2009–10	2010–11
State forest	Native				8,310	5,290
	Plantation pine				7,020	8,350
	Plantation hardwood				310	450
	Total				15,640	14,090
Freehold and leasehold	Native				1,950	980
	Plantation pine				3,080	2,260
	Plantation hardwood				130	0
	Total				5,160	3,240
Total native forestry					10,260	6,270
Total plantation forestry					10,540	11,060
<b>Total forestry</b>					<b>20,800</b>	<b>17,330</b>

Landsat		2006–07	2007–08	2008–09	2009–10	2010–11
State forest	Native	9,100	8,510	13,460	22,650	9,990
	Plantation pine	6,520	10,030	9,330	10,060	10,510
	Plantation hardwood	310	430	590	560	410
	Total	15,930	18,970	23,380	33,270	20,910
Freehold and leasehold	Native	2,350	2,740	5,190	5,670	2,510
	Plantation pine	920	2,280	2,610	3,750	3,070
	Plantation hardwood	0	10	120	10	110
	Total	3,270	5,030	7,920	9,430	5,690
Total native forestry		11,450	11,250	18,650	28,320	12,500
Total plantation forestry		7,750	12,750	12,650	14,380	14,100
<b>Total forestry</b>		<b>19,200</b>	<b>24,000</b>	<b>31,300</b>	<b>42,700</b>	<b>26,600</b>

**Note:** The figures shown in Table 4.2 are annualised rates to enable relative 'annual' comparisons to be made between all periods. Rates are rounded to a multiple of 10 ha.

### Rural and major infrastructure

This category includes all activities where the woody canopy has been reduced due to clearing for rural infrastructure including fence lines and firebreaks, as well as major infrastructure such as powerlines, water pipelines, highways, roads and major works. This class includes mine extensions and related mining activities.

The reduction in woody vegetation due to rural and major infrastructure was 23 per cent less than the 2009–10 period.

### Fire scars

This category includes areas where the woody canopy cover has been reduced due to fire-related effects. However, this class does not capture all historic fire scars, only those that had substantial leaf reduction at the time of image acquisition. In most cases, the reduction in woody vegetation cover in areas identified as fire scars is temporary and does not result in a permanent reduction in woody vegetation cover.

The rate of woody vegetation decrease due to fire was 72 per cent compared to the 2009–10 period. These fires occurred predominately in the eastern third of the state.

## Comparison of SPOT5 and Landsat5 woody vegetation change mapping

The new woody vegetation change rates in this report are based on SPOT5 satellite imagery that was analysed at a 5-metre resolution whereas previous reports were based on the 30-metre resolution Landsat imagery. This difference in resolution is responsible for the difference in woody vegetation change rates derived from SPOT5 and Landsat5 for the 2009–10 and 2010–11 periods as seen in the above tables.

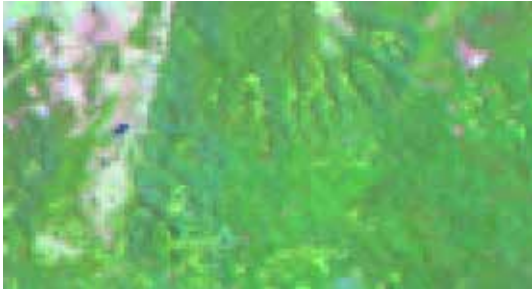
The images in Figure 4.3 demonstrate some of the effects of resolution difference. As SPOT5 is higher resolution it detects many more small clearing events. The dark green areas in the SPOT5 change image (f) represent clearing of scattered trees for agricultural purposes that were missed in the Landsat5 change image (e). The blue areas in the change images are clearing for forestry. These areas are detected in both Landsat5 (e) and SPOT5 (f) change images but the area of change has been overestimated by Landsat5 as the imagery is too coarse to be able to discern the many unaffected gaps between the cleared trees within the cleared areas.

SPOT5 imagery detects more and smaller change events than Landsat, as seen by comparing images (e) and (f). The reported change area for Landsat can be higher due to overestimation of the change area by the coarser Landsat imagery.

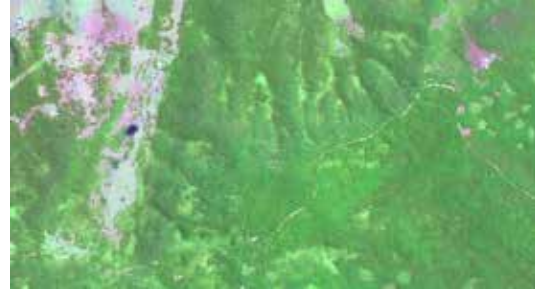
The difference in change area is dependent on the pattern of change and is greater in discontinuous clearing such as in native forest harvesting.

The reported change areas and rates based on the higher resolution SPOT5 imagery are generally more accurate than those from Landsat5.

(a) Landsat image for 2010



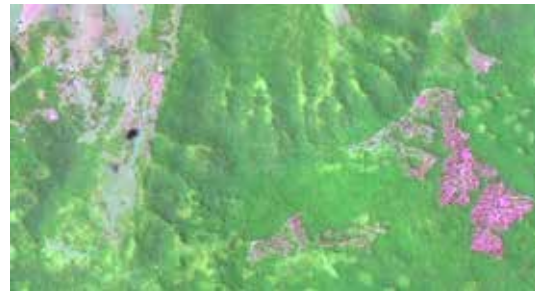
(b) SPOT5 image for 2010



(c) Landsat image for 2011



(d) SPOT5 image for 2011



(e) Landsat image change for 2010–11



(f) SPOT5 image change for 2010–11



**Figure 4.3** Comparison of SPOT5 and Landsat5 woody vegetation change showing the effects of the difference in resolution. SPOT5 detects clearing of scattered trees that were missed by Landsat5, as shown by the dark green areas in images (e) and (f). Both are able to detect large areas of clearing, as shown by the blue areas in images (e) and (f); however, the area estimated by Landsat5 (52 ha) is larger than the SPOT5 estimate (25 ha) because it was unable to detect the many gaps in the clearing.

## Data sources

The SPOT5 imagery used in this study was acquired from Astrium GEO-Information Services and was rectified by Geoimage. Imagery for the 2009–10 period was acquired between October 2008 and August 2010. The 2010–11 analysis used imagery collected between October 2009 and July 2011. Also referenced is the 2008 Woody Vegetation Extent Report.



## 5 Compliance and Enforcement Report Card

### Compliance assurance framework

The Office of Environment and Heritage (OEH), in partnership with Local Land Services and the Environment Protection Authority (EPA), manages the implementation of the NV Act and the Native Vegetation Regulation 2013.

OEH has primary responsibility for compliance assurance under the NV Act in relation to broadscale clearing, while (since 2012) the EPA regulates the logging of native forests on private lands. Both organisations maintain a fair and balanced framework which promotes voluntary compliance in order to maintain environmental and forest values, promote good land management practices, and help prevent illegal clearing. OEH and the EPA also ensure that appropriate regulatory action is taken where deliberate and harmful breaches are found to occur. This approach lets landholders get on with the business of managing their land, while protecting the natural resources and environment upon which sustainable agriculture and forestry are based.

OEH and the EPA use satellite images and aerial photography, as well as public notification and field reconnaissance, to monitor native vegetation clearing. These reports are initially checked to determine if there is any documented explanation for the change, such as clearing within state forests, or clearing under an approved PVP. Monitoring since 2008 has demonstrated that the vast majority of clearing is lawful activity.

The remaining reports of clearing are assessed for their potential risk to the environment and the regulatory system, and investigated accordingly. Investigations typically involve the examination of aerial photographic images, site inspections, and interviews with the landholders and other relevant parties. In many instances, these investigations determine that clearing is lawful, such as clearing of regrowth as defined in the NV Act, or clearing for routine agricultural management activities.

In those instances where unlawful clearing is identified, an appropriate response is determined based on such factors as the severity of the impact, culpability and any mitigating circumstances. Enforcement actions are necessary to ensure a level playing field, penalising those who choose not to comply with the legislation and act as a deterrent to future breaches. Remediation of environmental harm is also a priority. Remedial directions are issued, after consultation with landholders, to ensure that harm caused by illegal clearing is addressed.

In addition to risk-based case-by-case investigations, the EPA and OEH also maintain an active compliance program aimed at identifying emerging compliance issues and use targeted and strategic communications, often working with partner organisations, to respond to patterns of non-compliance.

### Compliance activity

In 2012-13 OEH received 409 reports of vegetation clearing to Environment Line, and upon investigation, many of these were found to be lawful clearing. OEH responded to various offences under the legislation with ten penalty notices issued, ten directions to remediate 849 hectares of land, and 154 advisory and warning letters sent. Significant breaches resulted in the commencement of three prosecutions, and two convictions.

**Table 5.1** Compliance and enforcement actions

	2009–10	2010–11	2011–12	2012–13
<b>Legal directions</b>				
Stop work orders served	0	0	2	0
Remedial directions served	39	32	17	10
<b>Advisory and warning letters</b>				
Numbers sent	195	264	235	154
<b>Prosecutions *</b>				
Commenced	7	5	2	3
Convictions	12	2	5	2
<b>Penalty notices</b>				
Numbers issued	20	36	12	10

\*Prosecutions completed in 2012–13 were not all commenced in 2012–13.

## Strategic awareness raising

OEH conducts strategic awareness raising to enable resources to be targeted to investigating clearing incidents that pose the most significant risk of harm to the environment. The number, location, size and time of clearing incidents and the conservation value of the vegetation affected are considered when determining the level of risk.

In late 2012, OEH received a number of reports of unexplained clearing incidents and potential damage to koala habitat around Moree in northern NSW. This cluster of clearing presented an emerging regulatory and environmental risk. OEH staff contacted 13 landholders and arranged to meet them on their properties to discuss vegetation management requirements, and determine if the clearing was authorised.

## Supporting voluntary compliance

The Native Vegetation Report Card illustrates the vast majority of farmers and PNF operators are doing the right thing when it comes to native vegetation. The NSW Government is committed to finding ways for OEH, the EPA, Local Land Services, and other agencies to improve their delivery of services to support this voluntary compliance. The focus is on equipping landholders to work within the rules.

Occasionally, landholders make honest mistakes. In such cases, the emphasis is placed on working with the farmers and foresters to ensure that their legislative responsibilities are understood and any environmental harm mitigated. For those landholders who clear deliberately outside the law and cause significant harm, OEH and the EPA will use the law in a sensible way to protect and restore the environment and the natural resources that underpin agricultural production.

To find out the full circumstances of a clearing incident, OEH may need to contact the landholder and visit the property before they can determine if the clearing is legitimate. In early 2013, in response to feedback from the community, OEH developed a fact sheet to address landholder concerns and questions about this process: 'What to expect when contacted by OEH about clearing of native vegetation' is to help landholders understand their rights and responsibilities, and those of the authorised officer conducting the site visit.

A visit from OEH staff provides an opportunity for landholders to ask questions about the native vegetation management framework and how they can improve their agricultural management practices while maintaining environmental values.

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