



Woody vegetation change Statewide Landcover and Tree Study

Summary report 2020

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Introduction

This Statewide Landcover and Tree Study (SLATS) summary report provides key findings for loss of woody vegetation due to agriculture, forestry, and infrastructure activities across NSW in 2020.

Each year rates of woody vegetation loss in NSW vary due to economic and seasonal influences. The reporting year 2020 is likely to have been influenced by the 2019–20 extreme bushfire season, extensive rains after drought and the COVID-19 pandemic.

Methods to detect woody vegetation change have evolved since yearly monitoring began in 2007. The results for woody vegetation change in 2017–20 were generated using imagery from the Sentinel-2 satellite. Results for 2015 and 2016 were based on analysis of imagery from SPOT-5, SPOT-6, and Sentinel-2 satellite sensors. Results reported between 1988 and 2014 were based on SPOT-5 and Landsat imagery. The full results for each year from 1988, including rates of woody vegetation loss across different land management units, are available for comparison in the ‘Results Woody Vegetation Change, Statewide Landcover and Tree Study (SLATS) 2020’ Excel spreadsheet.

Woody vegetation change is detected through a combination of automated and manual interpretation of the differences between images captured during summer each year. Satellite images are selected as close as possible to 1 January for that year. Images must have a clear view of the ground and not be impacted by smoke or cloud cover. This requirement can result in images being captured on a range of dates each year. The 109 Sentinel-2 images selected for the 2020 SLATS were generated between November 2020 and early February 2021; however, clearing figures are reported as rates of change in hectares (ha) for each calendar year. Visit our ‘Woody vegetation change: Statewide Landcover and Tree Study method’ webpage for more information.

Figures generated for each SLATS report may be updated in future reports to reflect improved processing methods, data availability or changed administrative boundaries.

SLATS datasets are made available on the NSW Government’s Sharing and Enabling Environmental Data (SEED) portal once requirements under the *Government Information (Public Access) Act 2009*, section 14 (public interest against disclosure) and the *Privacy and Personal Information Protection Act 1998* have been met.

SLATS data is combined with data on non woody vegetation loss and analysed across land regulated under the *Local Land Services Act 2013* in the *Woody and non woody landcover change on rural regulated land: Summary report 2020*.

Our ‘Landcover monitoring and reporting’ webpage has more information about how we monitor and report on landcover change.

Fire extent and severity is now reported each year using fire extent and severity mapping, an approach developed by our scientists in collaboration with the NSW Rural Fire Service. Further information is available on the ‘Fire extent and severity maps’ webpage.

Statewide trends in woody vegetation loss

The calculated annual loss of woody vegetation for 2020 was 51,400 ha or 0.06% of the area of NSW. Annual rates of woody vegetation loss continue to decrease from a peak clearing of 60,800 ha in 2018 (Figure 1). The 2020 figure continues to exceed the 2009–17 average of 38,800 ha.

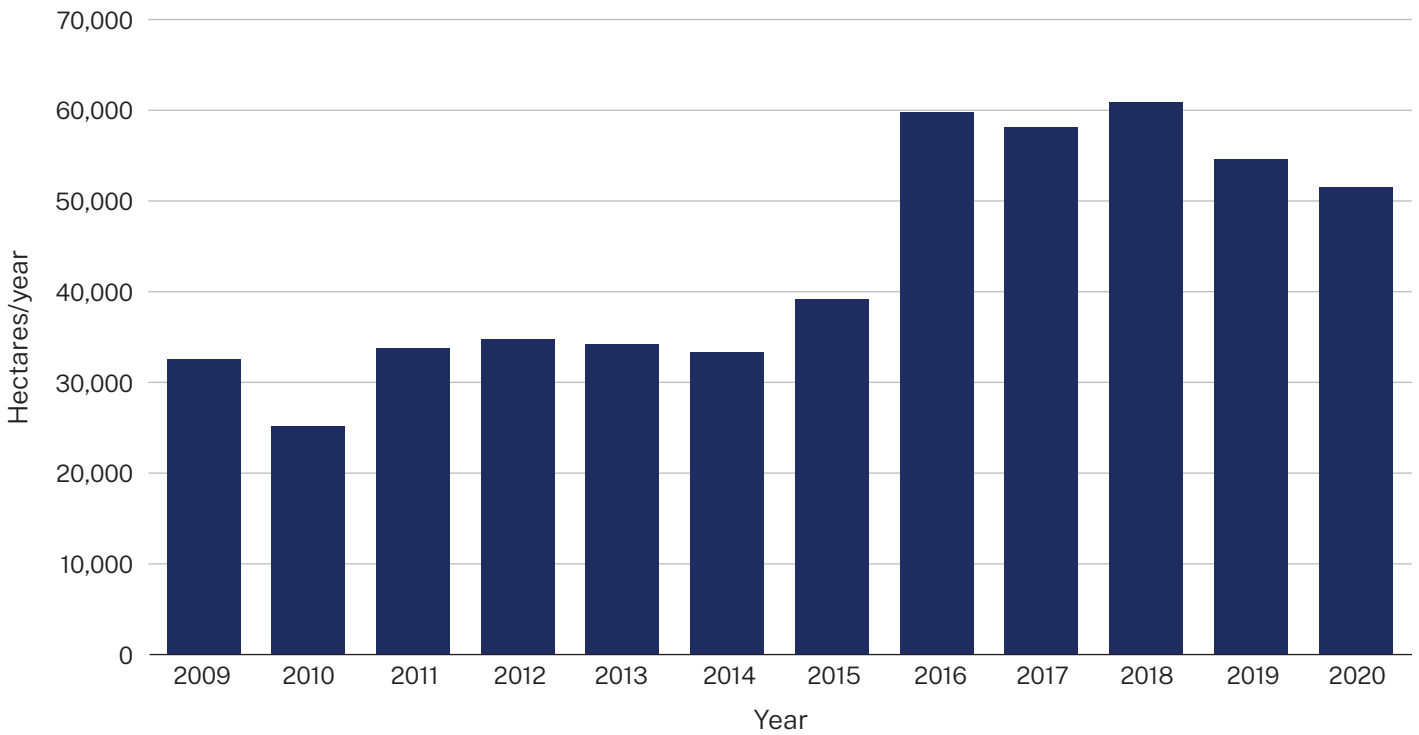


Figure 1 Trends in annual rate of woody vegetation loss

Results for 2009–14 based on SPOT-5 and Landsat imagery; 2015–16 results based on SPOT-5, SPOT-6 and Sentinel-2 imagery; 2017–20 results based on Sentinel-2 imagery.

Woody vegetation loss by landcover class

Vegetation loss is assigned a landcover class that indicates the likely purpose for which vegetation was removed. These classes are assigned using visual cues and a range of ancillary data when interpreting imagery.

Woody vegetation loss is identified in 3 classes:

- agriculture
- forestry
- infrastructure.

Proportion of vegetation loss across landcover classes in 2020 is distinctly different to the previous 4 years, more closely resembling the pattern in 2016 (Figure 2).

Annual woody vegetation harvesting for forestry increased by 28% in 2020 compared to 2019. Forestry harvesting was last at this level in 2016. It should be noted that state forests harvested are regrown in perpetuity.

There was a 44% decrease in clearing of woody vegetation attributed to agriculture in 2020 compared to 2019. Agricultural clearing was last at this level in 2015. Clearing for infrastructure remained relatively stable.

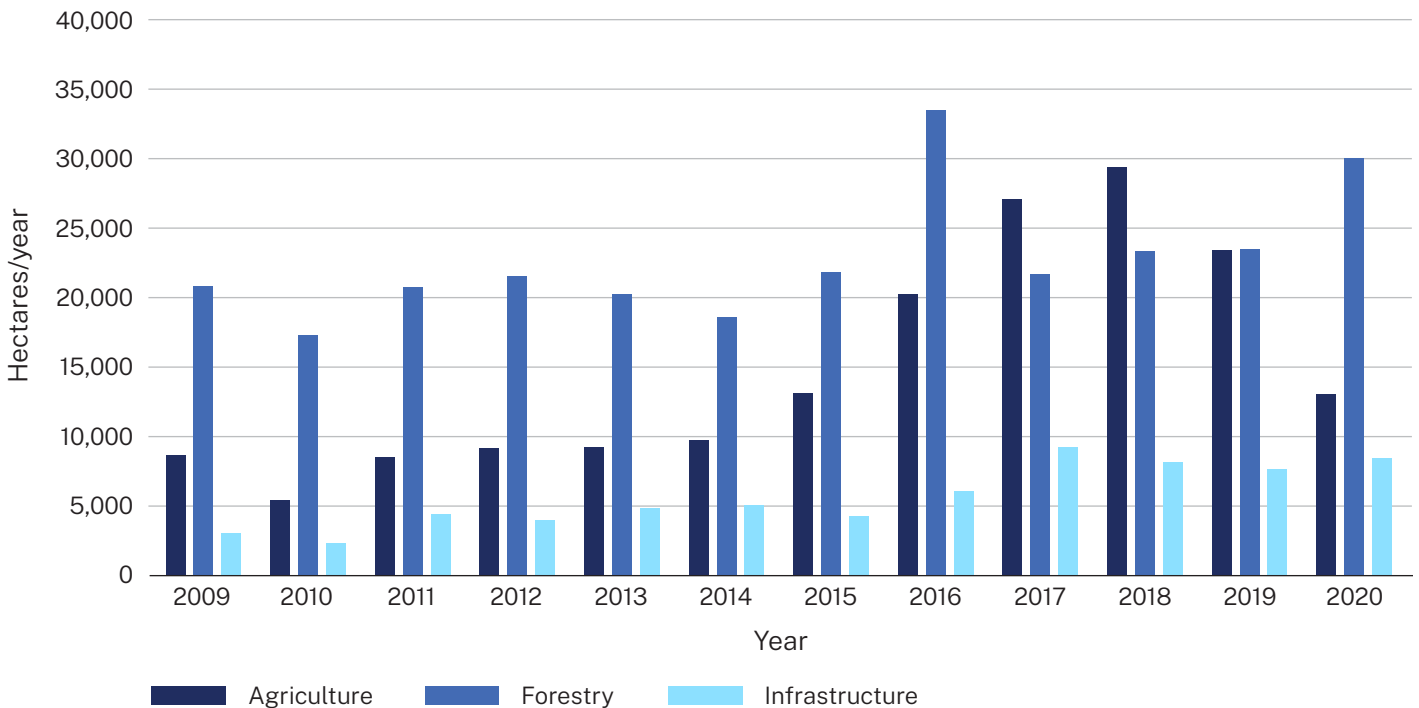


Figure 2 Woody vegetation loss by landcover class

Results for 2009–14 based on SPOT-5 and Landsat imagery; 2015–16 results based on SPOT-5, SPOT-6 and Sentinel-2 imagery; 2017–20 results based on Sentinel-2 imagery.

Figure 3 shows the location of clearing for 2020. The hot spots in the south and east were attributed to forestry (Figure 8), and those in central NSW were attributed to agricultural clearing (Figure 9).

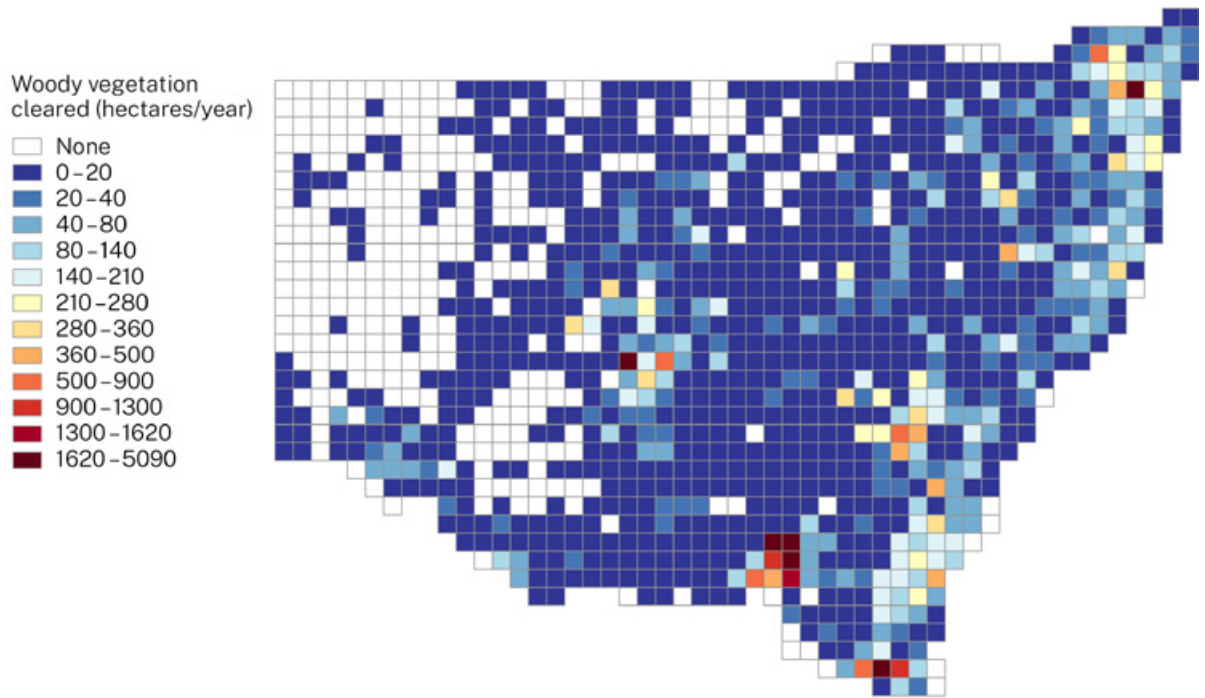


Figure 3 Geographic distribution of woody vegetation loss

Figure 4 shows the geographic distribution of existing woody vegetation across NSW in 2020, represented by a 25 km × 25 km grid cell map.

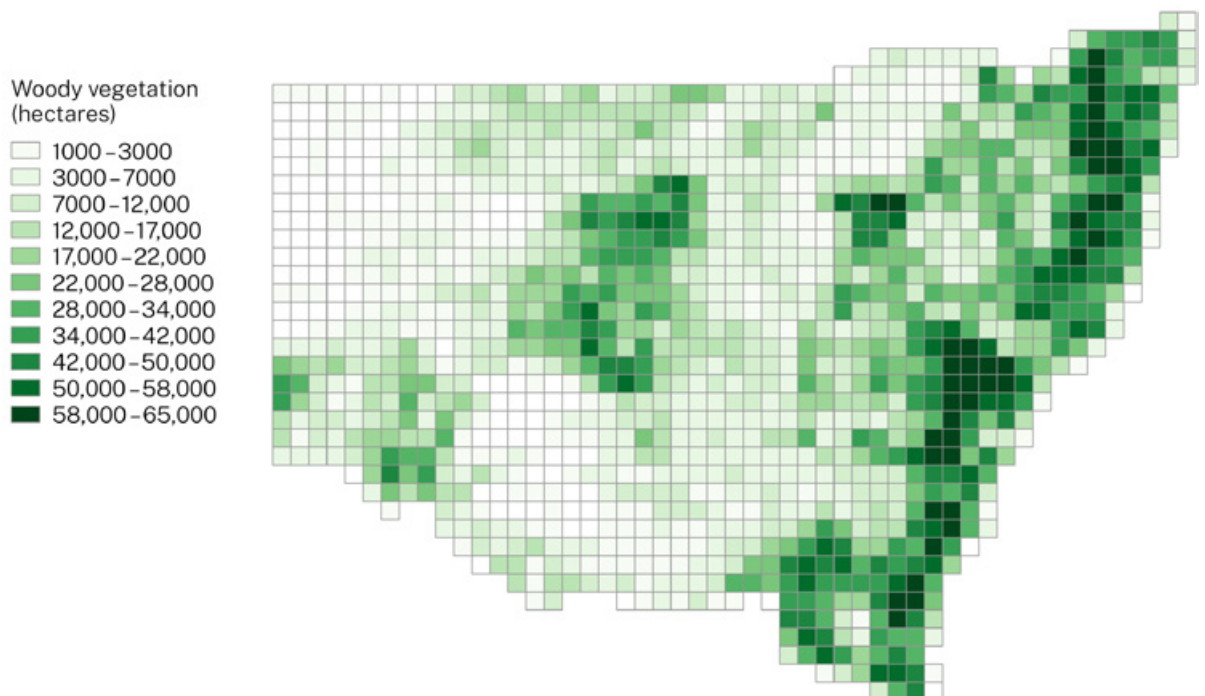


Figure 4 Geographic distribution of existing woody vegetation

Figure 5 shows where vegetation loss had the greatest proportional impact on areas of existing woody vegetation.

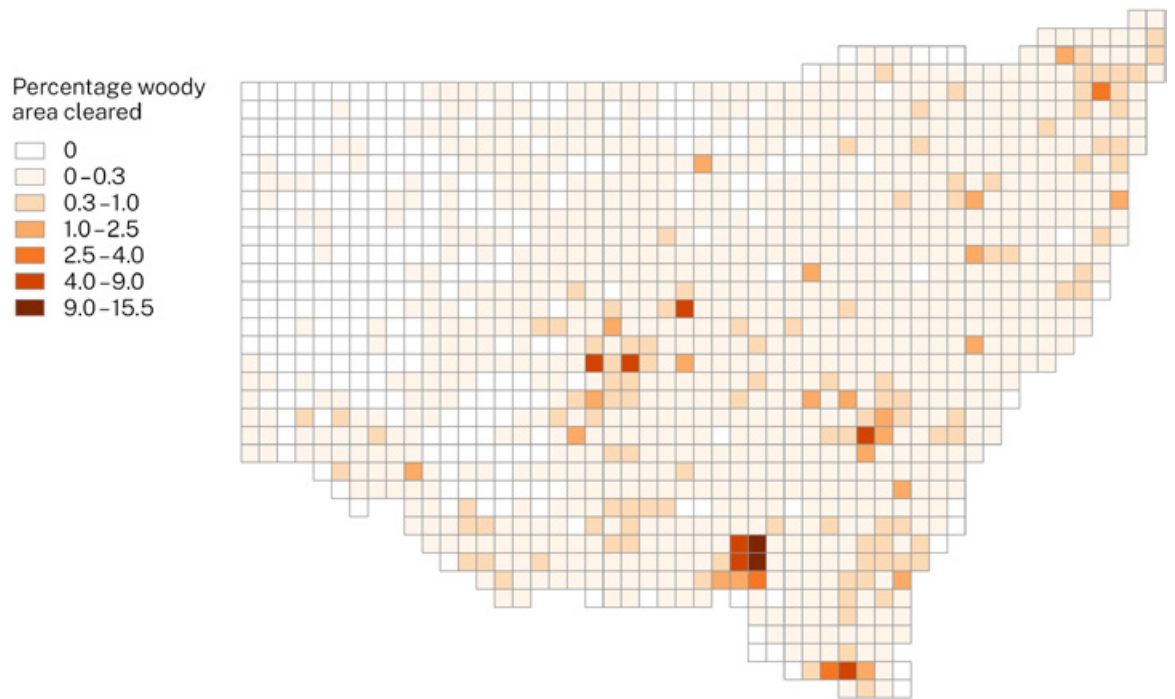


Figure 5 Woody vegetation loss as a percentage of existing woody vegetation in 2020

Forestry

The forestry landcover class includes areas where vegetation removal has been attributed to forest harvesting activities. This includes private native forestry, harvesting within state forests and harvesting within plantations. State forests are harvested for renewable timber and regrown in perpetuity.

Geographic information system analysis was used to divide annual woody vegetation removal due to forestry into categories based on land tenure and management practice. This detailed information is available in the 'Results Woody Vegetation Change, Statewide Landcover and Tree Study (SLATS) 2020' Excel spreadsheet.

Forestry harvesting increased in 2020 by 6,500 ha when compared to 2019, discontinuing the previously stable 3-year harvesting rates (Figure 2). Figure 6 shows this increased harvesting occurred on state forest with the rate increased by 51% when compared to 2019, whilst harvesting in freehold/leasehold remained stable.

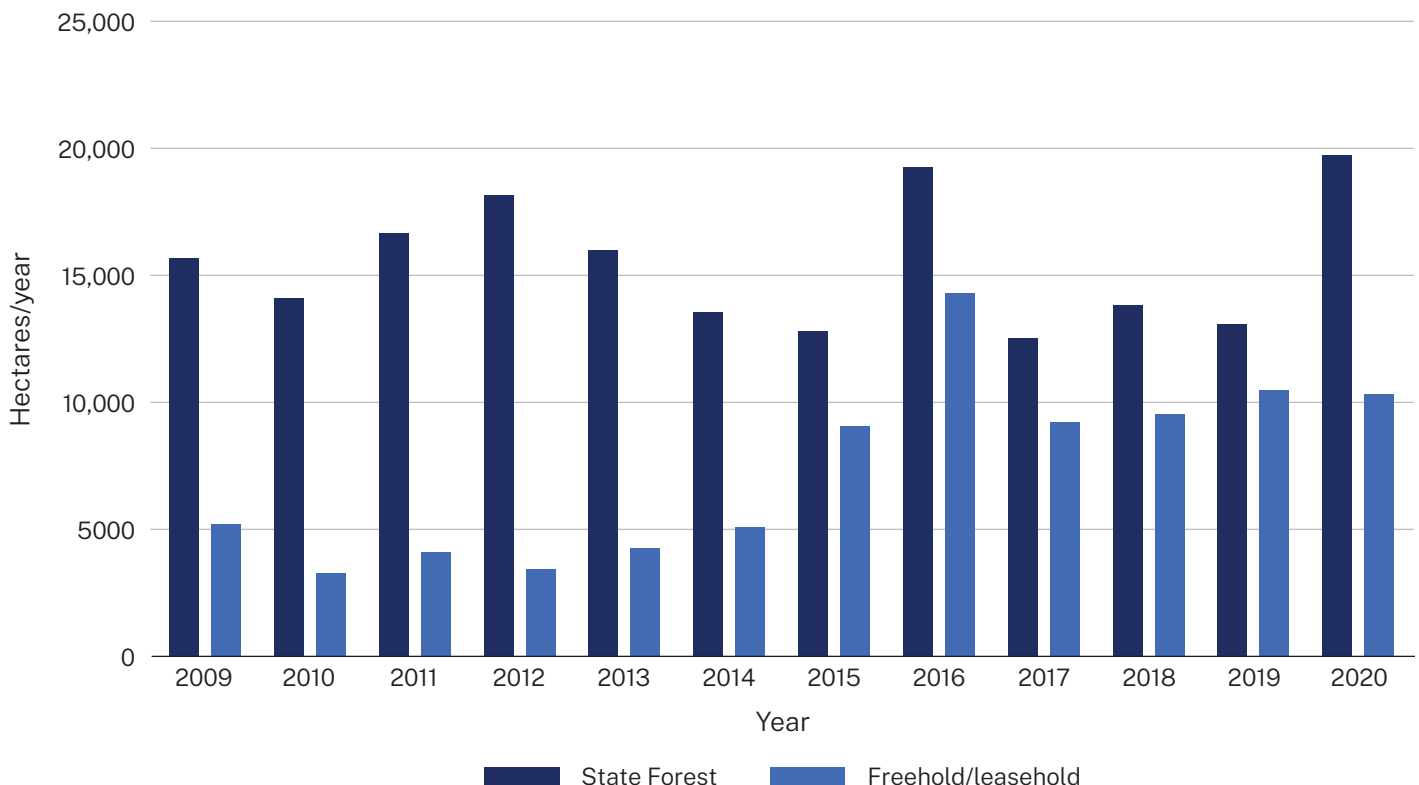


Figure 6 Trends in forest harvesting by tenure

Results for 2009–14 based on SPOT-5 and Landsat imagery; 2015–16 results based on SPOT-5, SPOT-6 and Sentinel-2 imagery; 2017–20 results based on Sentinel-2 imagery.

The increased harvesting in state forest is within plantation forestry (Figure 7). There is a consistent decreasing trend in native forestry practices since rates peaked in 2016.

It should be noted that forest re-establishment always occurs on state forests and usually occurs in other areas subjected to forest harvesting.

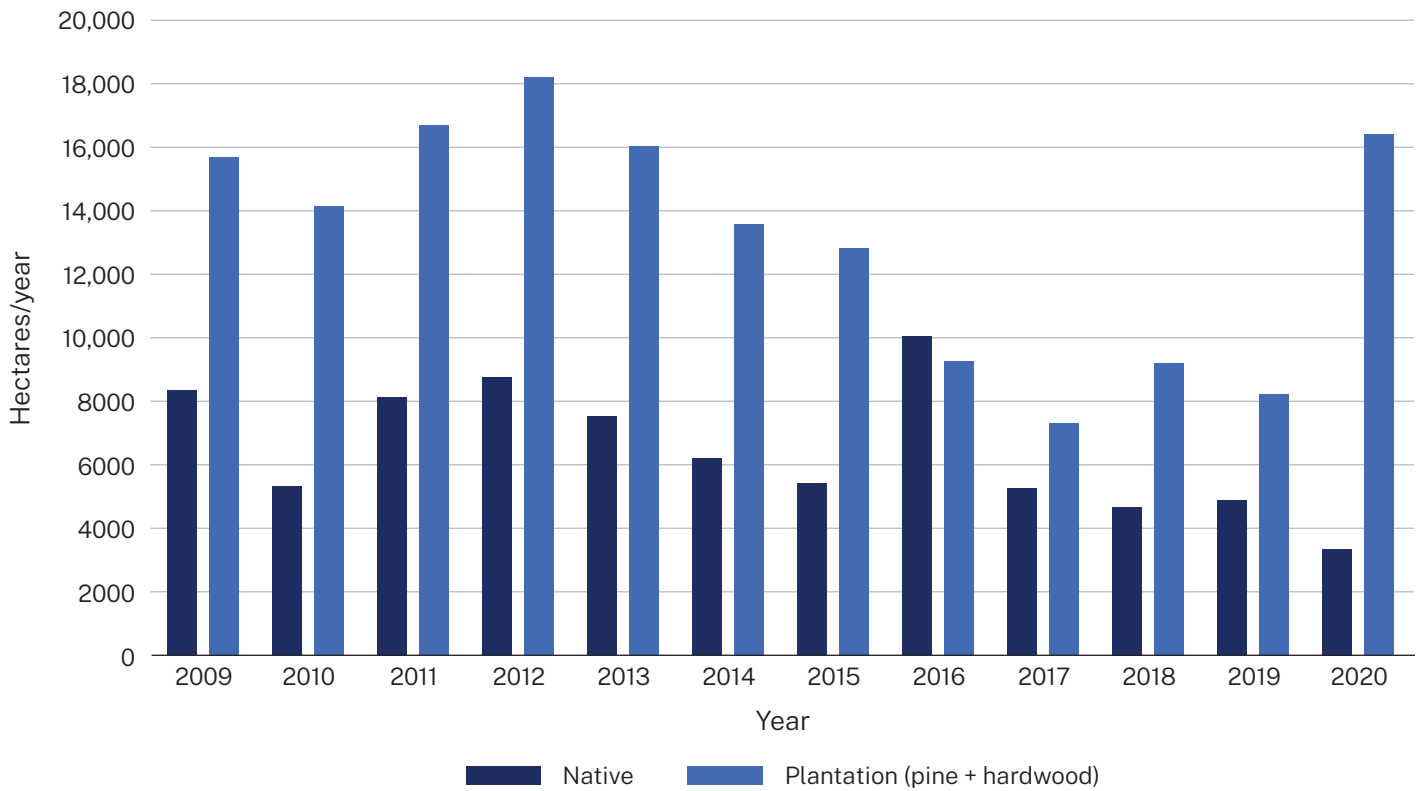


Figure 7 State forest harvesting by forestry practice

Results for 2009–14 based on SPOT-5 and Landsat imagery; 2015–16 results based on SPOT-5, SPOT-6 and Sentinel-2 imagery; 2017–20 results based on Sentinel-2 imagery.

Figure 8 shows that forestry activity is predominantly in the eastern third of the state with a focus in the south east.

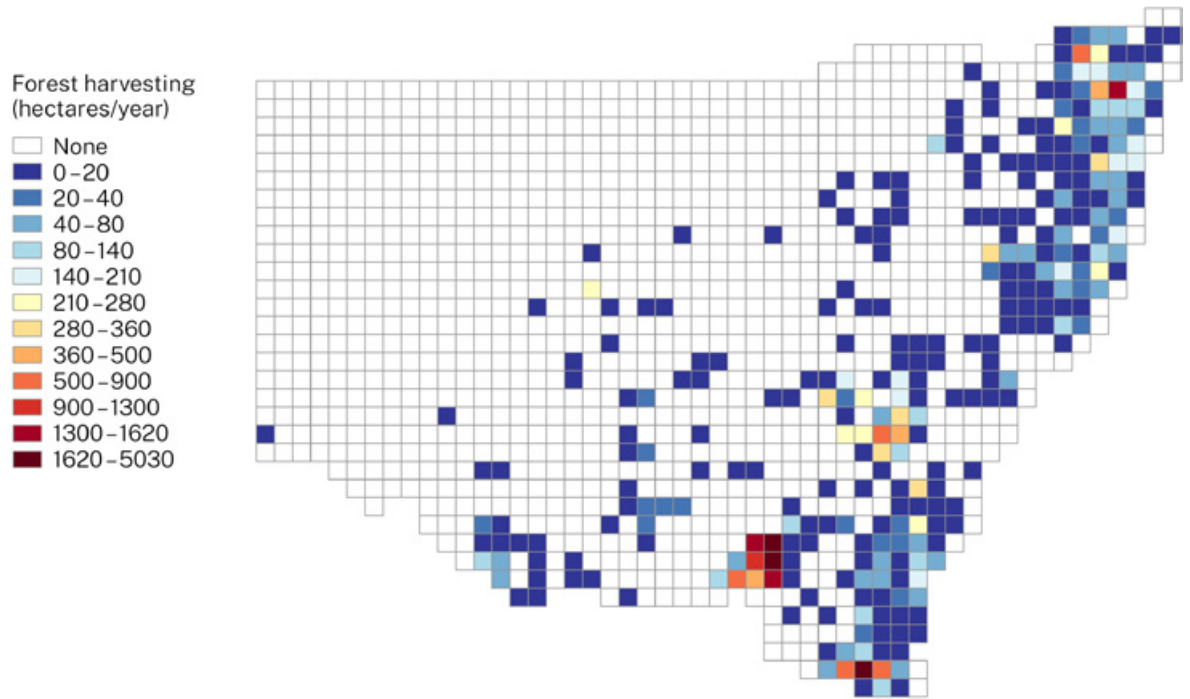


Figure 8 Geographic distribution of forest harvesting

Agriculture

This landcover class includes areas of woody vegetation loss due to agricultural activities such as cropping or establishing pasture. There was a decrease in the rate of vegetation loss due to agricultural activity from 23,400 ha in 2019 to 13,000 ha in 2020 (Figure 2). Figure 9 shows the rate of woody vegetation loss due to agriculture is highest in central NSW.

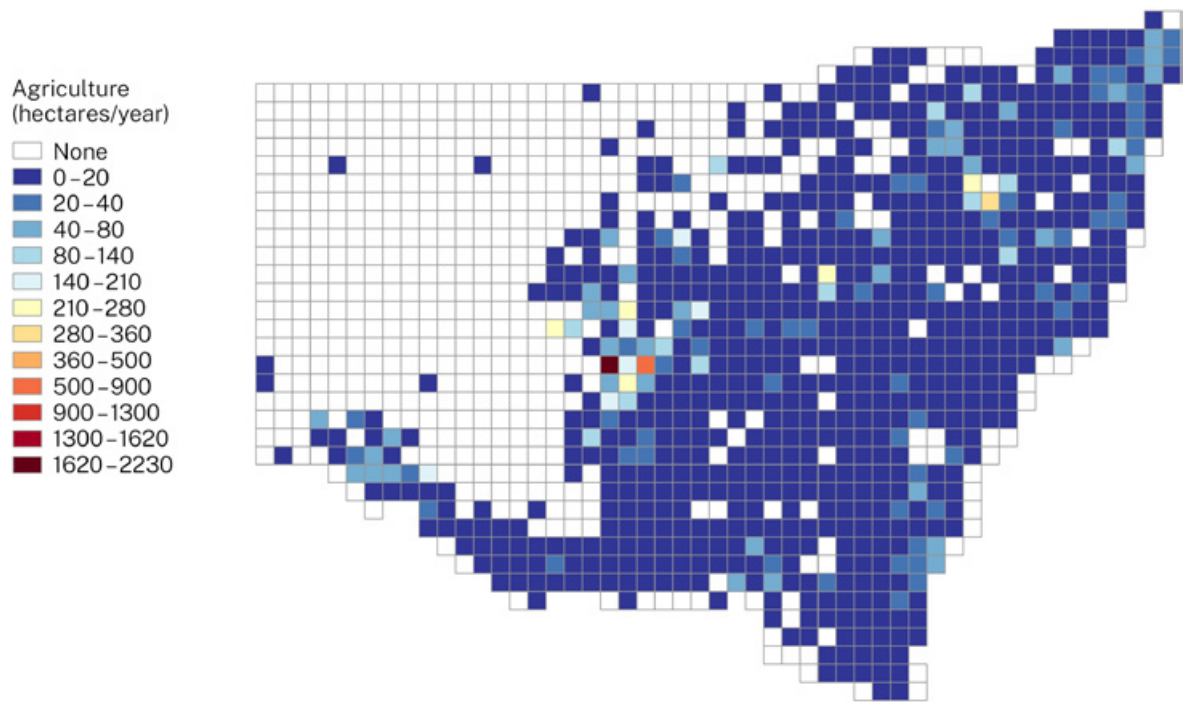


Figure 9 Geographic distribution of agricultural clearing

Infrastructure

This landcover class includes activities where woody vegetation loss is due to rural and urban infrastructure activities, including mining. Infrastructure clearing accounted for 16% of 2020 woody loss across NSW. The rate of woody vegetation loss due to infrastructure increased to 8,450 ha in 2020 from 7,580 ha in 2019.

When vegetation loss within the infrastructure landcover class is captured, in some cases more detailed classes are assigned using visual cues in satellite imagery and ancillary data.

Infrastructure classes are: farm infrastructure (for example fencelines and dams), transport and utilities (for example highways and powerlines), mining operations and other infrastructure (for example clearing associated with urban and residential development). Due to the extent of the 2019–20 fire season, firefighting activities such as clearing for fire trails and firebreaks surrounding or within recent fire scars was captured as a separate category. Clearing for regular maintenance of fire trails is not included in this category.

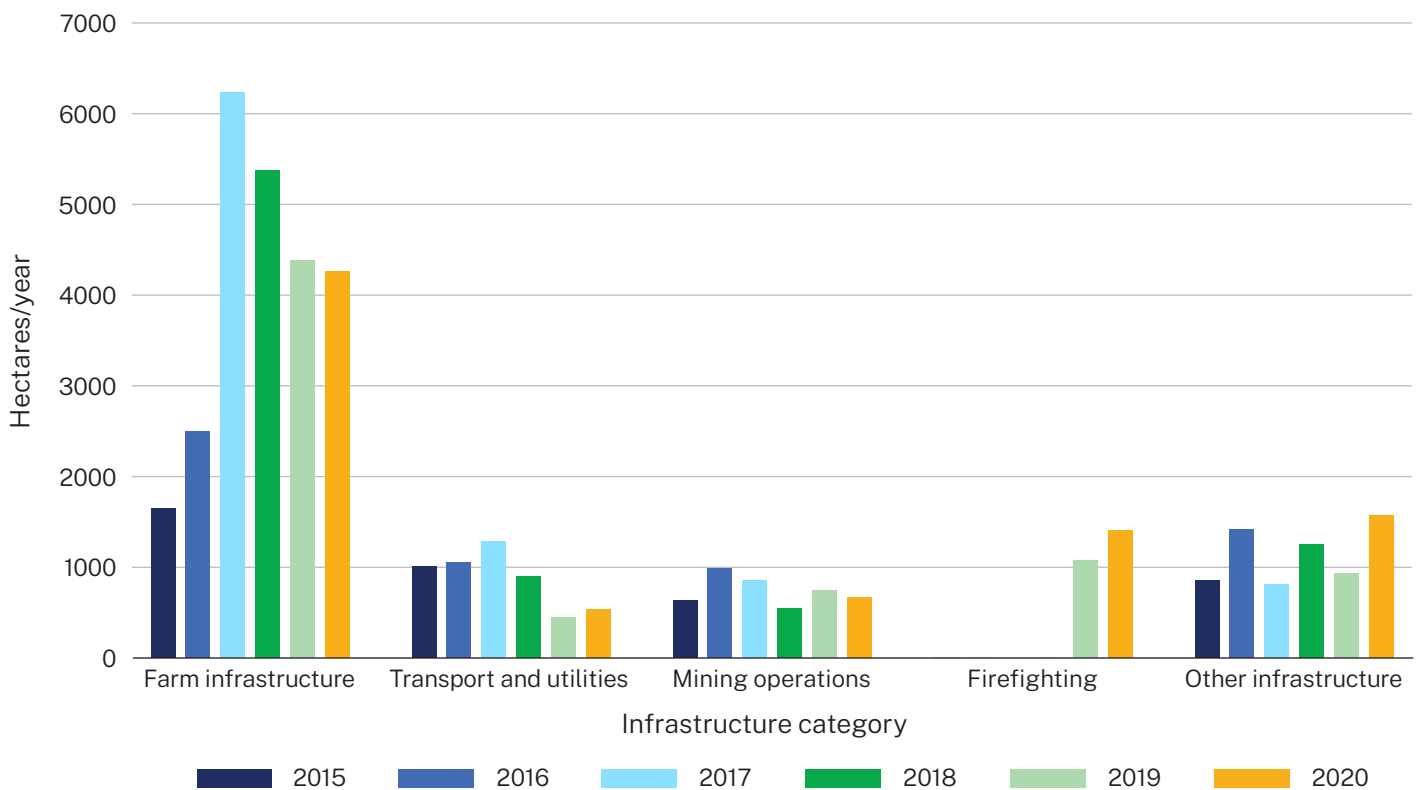


Figure 10 Trends in woody vegetation loss in the 5 detailed classes of infrastructure
Results for 2015–16 based on SPOT-5, SPOT-6 and Sentinel-2 imagery; results for 2017–20 based on Sentinel-2 imagery.

Figure 10 shows infrastructure clearing trends across the 5 detailed infrastructure classes. This figure demonstrates that farm infrastructure has been the major contributor to vegetation loss due to infrastructure; however, this has decreased since 2017, with a minor decrease from 2019.

There was a continued impact of firefighting in 2020, accounting for 14% and 17% of vegetation loss in the infrastructure class in 2019 and 2020, respectively. Images for woody vegetation monitoring analysis are captured as close as possible to 1 January each year. As the 2019–20 fire season occurred in summer, clearing due to firefighting for the 2019–20 fires may be captured in either the 2019 or 2020 SLATS report, depending on the date of the fire. This is demonstrated in Figure 11.

Vegetation loss by transport and utilities increased by 90 ha. The other infrastructure class (urban and residential) increased from 930 ha in 2019 to 1,570 ha in 2020. Mining operations decreased by 70 ha.



Figure 11 The 2019–20 fire year in relation to SLATS reporting periods



More information

- DPE (Department of Planning and Environment) (2022) [Landcover monitoring and reporting webpage](#), Environment and Heritage website, accessed 31 May 2022.
- [Fire extent and severity maps](#)
- DPE (Department of Planning and Environment) (2022) [Results Woody Vegetation Change, Statewide Landcover and Tree Study 2020](#), Environment and Heritage, access 31 May 2022.
- DPE (Department of Planning and Environment) (2022) [SLATS datasets](#), SEED, accessed 31 May 2022
- DPE (Department of Planning and Environment) (2022) [Woody and non woody landcover change on rural regulated land: Summary report 2020](#), Environment and Heritage website, accessed 31 May 2022.
- DPE (Department of Planning and Environment) (2022) [Woody vegetation change: Statewide Landcover and Tree Study method](#), Environment and Heritage website, accessed 31 May 2022.