Annual Progress Report 2024-25 Private Native Forestry Monitoring Program July 2025

NSW GOVERNMENT

Natural Resources Commission

The annual progress report has been prepared by the Natural Resources Commission on behalf of the **NSW Forest Monitoring Steering Committee**.

Natural Resources Commission | Local Land Services | Crown Lands | Department of Primary Industries and Regional Development | Department of Climate Change, Energy, the Environment and Water

Aboriginal Affairs NSW | Forestry Corporation

The University of Sydney | The University of Melbourne | Australian National University

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Acknowledgement of Country

The Natural Resources Commission acknowledges and pays respect to traditional owners and Aboriginal peoples. The Commission recognises and acknowledges that traditional owners have a deep cultural, social, environmental, spiritual and economic connection to their lands and waters. We value and respect their knowledge in natural resource management and the contributions of many generations, including Elders, to this understanding and connection.

List of acronyms

CEO	Chief Executive Officer
DPIRD	NSW Department of Primary Industries and Regional Development
DCCEEW	NSW Department of Climate Change, Energy, the Environment and Water
EPA	NSW Environment Protection Authority
IFOA	Integrated Forestry Operations Approval
LLS	Local Land Services
MER	Monitoring, Evaluation and Reporting
NRC	Natural Resources Commission, 'the Commission'
NSW	New South Wales
PNF	Private Native Forestry
SLATS	Statewide Landcover and Tree Study

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Cover image: Private native forest near Coffs Harbour NSW, image courtesy NRC staff.

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1 Private Native Forestry Monitoring Program

In New South Wales, private native forestry (PNF) is the ecologically sustainable management of native forests on private property to produce timber or other forest products. The rules for conducting native forestry on private land are set out in four PNF codes of practice (PNF codes), established under the *Local Land Services Act 2013* (NSW) (**Figure 1**).[1]

The PNF codes released in May 2022 introduced new requirements for monitoring, assessment, and adaptive management. The codes task the NSW Forest Monitoring Steering Committee (the Steering Committee),[2] independently chaired by the Natural Resources Commission (the Commission), to:

- propose and oversee a PNF Monitoring, Evaluation and Reporting (MER) Framework
- conduct annual checks to ensure the evidence base, including maps, is up to date, identify emerging evidence from monitoring and research, and opportunities for improvement
- formally assess the data and evidence every five years and advise relevant Ministers whether there is sufficient evidence to warrant a review of the codes[3]
- oversee updates to the PNF Koala Prescription Map.[4]

The PNF MER Framework proposed by the Steering Committee was jointly approved by the Chief Executive Officer (CEO) of Local Land Services (LLS) and the Secretary of the then Department of Planning and Environment in November 2023.[5]

Table 1 sets out the agencies and experts involved in the Steering Committee, including:

- NSW agencies with responsibilities for natural resource and environmental policy, regulation, science and monitoring, and forest management
- four independent experts providing advice on biodiversity, forestry, fire ecology, and soil and water.

Chapter 3 provides insights from available monitoring and investigations, and highlights evidence by the evaluation questions in the PNF MER Framework. Insights are presented on landholder reported harvest areas and volumes, results from fauna monitoring in private native forests, and a summary of recent research and reports from other evidence sources. For example, the acoustic data archive collected as part of fauna monitoring on private forests from 2019 to 2023 has now been analysed for 10 different species including the koala, with detections indicating all 10 species have persisted post the 2019-20 fires. Analysis is underway to understand trends in species occupancy using this data.

As noted in the PNF MER Framework, there are constraints when collecting monitoring data on private property as landholder participation is voluntary and privacy and confidential matters need to be considered. As such, there will be a higher reliance on remote sensed data and less direct field data to detect change and potential impacts to forests and threatened species. This presents challenges for the program to measure

1 Part 5B of the *Local Land Services Act 2013* sets out the objects, definitions and requirements for private native forestry.
2 NRC (2023) *Program governance and engagement*.
3 Relevant Ministers are the Minister administering the *Forestry Act 2012*, the Minister administering the *Local Land Services Act 2013* and the Minister administering the *Biodiversity Conservation Act 2016*.
4 See clauses 4.3 (2) and (3), and koala prescriptions in Appendix A, of the PNF codes.
5 NRC (2023) Approved Private Native Forestry Monitoring, Evaluation and Reporting Framework.

improvements or degradation, and risks to improving the evidence base and informing timely decisions, including adaptive management of prescriptions for threatened species. These challenges, and the extent to which the monitoring program can address them, will be identified in the implementation plan. Local Land Services is developing the implementation plan. Until the plan is established, the annual progress report is reporting on available evidence.

This is the third annual progress report for PNF MER program.

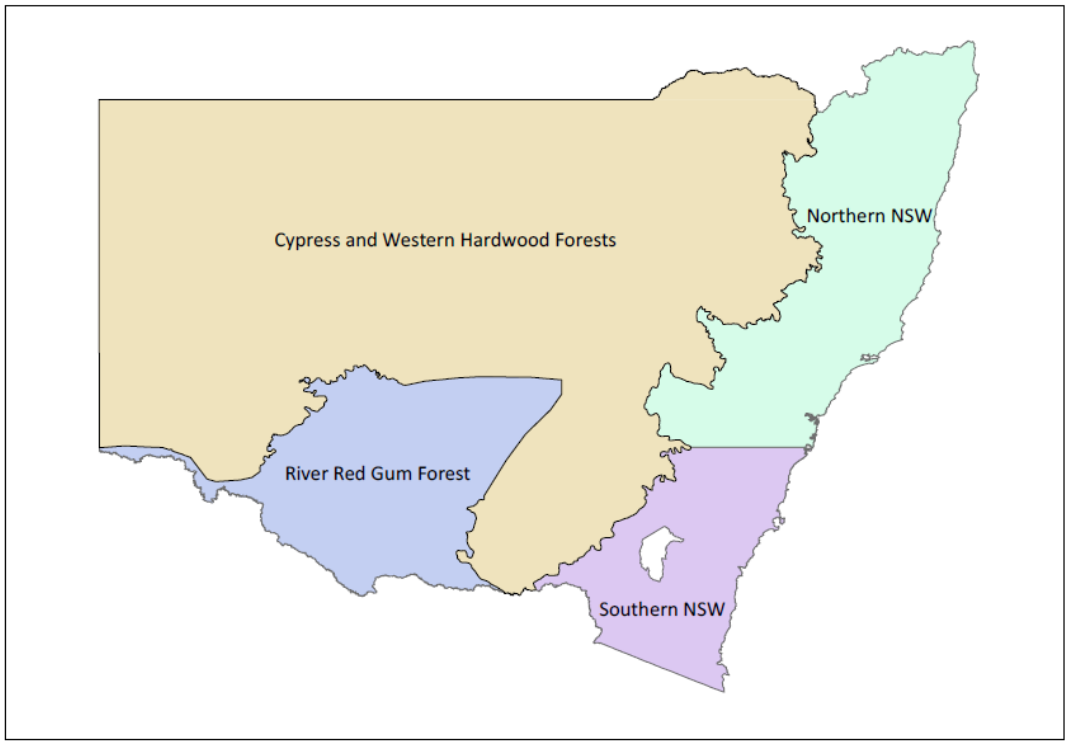


Figure 1: PNF code of practice regions in NSW[6]

Table 1: NSW Forest Monitoring Steering Committee composition

NSW Government agencies	Independent experts
▪ Natural Resources Commission (Chair) ▪ Local Land Services (LLS) ▪ Environment Protection Authority (EPA) ▪ Department of Climate Change, Energy, the Environment and Water (DCCEEW) ▪ Department of Primary Industries and Regional Development (DPIRD) ▪ Aboriginal Affairs NSW ▪ National Parks and Wildlife Service (NPWS) ▪ Forestry Corporation of NSW (FCNSW) ▪ Crown Lands	▪ Professor Patrick Baker, University of Melbourne ▪ Professor Phillip Gibbons, Australian National University ▪ Associate Professor, Tina Bell, University of Sydney ▪ Dr Peter Hairsine, Australian National University

6 PNF codes for Northern NSW and Southern NSW regions, apply to all forests in those regions except those that meet the definitions of river red gum forests, cypress forests or western hardwood forests. The boundaries shown in this figure are non-statutory.

2 Progress and achievements in 2024-25

Table 2 outlines the status of program delivery since the PNF codes were released in May 2022. The following sections detail progress, as well as projects completed or commenced in 2024-25. Monitoring and research findings are provided in **Chapter 3**.

Table 2: Progress dashboard

PROGRESS DASHBOARD		
Develop the PNF MER Framework and implementation plan		
PNF MER Framework developed (NRC), endorsed by Steering Committee July 2023 and approved by CEO of LLS and Secretary of the then Department of Planning and Environment November 2023	**Completed**	✓
LLS develop PNF MER implementation plan	**In progress**	›››
LLS implement PNF MER implementation plan	**Not started**	...
Research and evaluation projects		
Remote sensing feasibility study (NRC)	**Completed**	✓
Process to verify and improve the PNF koala prescription map and underlying models		
Evaluate map and models, propose approach to update (NRC, independent experts, technical review team)	**Completed**	✓
Independent evaluation of PNF koala prescription map (NRC)	**Completed**	✓
Develop guidance for identifying high value koala habitat (NRC)	**Completed**	✓
LLS develop protocol for landholder requested review of the PNF koala prescription map at a property scale	**Completed**	✓
DCCEEW prepare updated koala habitat model and model inputs	**In progress**	›››
DCCEEW prepare next draft PNF Koala Prescription Map	**Commenced**	›››
Risk-based review of threatened species protections (NRC)		
Develop shortlisting approach and apply to threatened species in Appendix A of the PNF codes to identify key species	**Completed**	✓
Develop risk assessment framework and apply to key species	**Completed**	✓
Consider risk ratings and if further protections warranted	**In progress**	›››
Reporting and adaptive management (NRC)		
Annual check of evidence base for 2022-23, 2023-24 and 2024-25	**Completed**	✓
Annual Progress Report 2022-23 (published July 2024)	**Completed**	✓
Annual Progress Report 2023-24 (published November 2024)	**Completed**	✓
Annual Progress Report 2024-25 (published July 2025)	**Completed**	✓

2.1 Work continues to develop PNF MER implementation plan

LLS is preparing the PNF MER implementation plan and has primary responsibility to fund and deliver the plan. LLS is working to finalise the plan now, consistent with the PNF MER Framework and with consideration of priorities and resources. Completion of the implementation plan is a high priority for the monitoring program and will be delivered by September 2025.

The implementation plan will detail the monitoring and targeted investigations to build the evidence base and inform decision making, longer-term reviews and adaptive management. The annual work plan will outline priorities aligned to available resources.

The Steering Committee, independently chaired by the Commission, will oversee implementation of the plan once endorsed. In addition, the Steering Committee exercises its oversight role through annual checks of the evidence base, annual progress reports, and the five-year formal assessment of data and evidence, which will commence in 2027.

The remote sensing feasibility study completed in August 2024 is a key input to inform the adoption of forest biophysical indicators for the implementation plan. The final report under the study, outlined potential forest indicators and used available data and case studies to illustrate how the indicators could be applied in the PNF monitoring program, subject to available resources.[7] For example, the study considered harvest area estimates derived from DCCEEW canopy disturbance data and found it was similar to LiDAR derived harvest area from the same period.

2.2 Improving the koala prescription map and underlying models

The Commission's advice on finalising the PNF codes recommended the PNF koala prescription map be adopted as an interim map due to constraints during development, including time and availability of information and modelling.[8]

The Steering Committee commenced the process to verify and improve the PNF koala prescription map and underlying habitat models in 2022-23. The project aims to ensure koala prescriptions for PNF are applied in high value koala habitat areas. Critical to its success is cross-agency collaboration, and in particular the work of the DCCEEW Remote Sensing and Landscape Science Branch.

The Steering Committee established a cross-agency technical review team chaired by Peter Cochrane, Assistant Commissioner. Agencies represented include the Commission, LLS, DCCEEW, EPA, DPIRD and FCNSW. The Commission engaged independent experts to provide advice and support the project, including:

- Honorary Professor Jane Elith, University of Melbourne
- Dr Alistair Melzer, Central Queensland University
- Dr Natalie Briscoe, University of Melbourne.

DCCEEW scientists and modellers have now developed a draft koala habitat suitability model for NSW. Key decisions for this modelling work have been informed by advice from the independent experts and agency scientists. Progress by DCCEEW during 2024-25 has included:

7 Hislop S and Stone C (2024) Remote sensing of NSW private native forests - Application of potential indicators. Report prepared for the NRC.

8 NRC (2022) Advice on finalising Draft Private Native Forestry Codes of Practice.

- checking correlations between bias layers and predictors
- finalising environmental predictors and bias covariates
- building the draft koala habitat suitability model and running multiple versions to test and check the most appropriate predictors and sensible model outputs
- internal DCCEEW review of draft model outputs with on ground koala experts
- sourcing available high quality presence/absence koala records to evaluate the draft model and conducting the evaluation.

Next steps include further testing of the draft model outputs with independent experts supporting this project, as well as other experienced agency staff, experts in koala habitat and the technical review team. Following completion of these tests, DCCEEW will prepare a revised draft PNF koala prescription map for the Steering Committee's consideration. When endorsed, the Commission will submit the revised draft PNF koala prescription map to relevant Ministers for their consideration. This will likely occur as part of the five-year formal assessment of data and evidence.

Changes to the PNF koala prescription maps require the joint approval of the Minister for Agriculture and the Minister for Environment.

2.3 Risk-based review of threatened species protections

The Commission's advice on finalising the PNF codes recommended the Steering Committee oversee a risk-based review of threatened species protections for key species in Appendix A of the PNF codes.[9] The Steering Committee commenced the risk-based review in 2022-23 and established a cross-agency technical review team chaired by Peter Cochrane, Assistant Commissioner. Agencies represented include the Commission, LLS, DCCEEW, EPA, DPIRD and FCNSW. The Commission engaged independent experts to provide advice and support the project, including:

- Dr Doug Binns, consulting flora ecologist
- Professor Philip Gibbons, Australian National University.

Building on the risk assessment work completed in 2023-24, the Commission has progressed work to consider if further mitigation options or complementary measures are required. Progress in 2024-25 has included:

- the Steering Committee endorsed the detailed risk-assessment results for 87 key species, including 16 fauna species for further consideration
- working with ecologists to identify potential mitigation options and complementary measures that could address the identified risks at the relevant scale
- assessing potential options with consideration of its efficiency, effectiveness and appropriateness using relative measures, as well as environmental, social and economic matters.

The project is nearing completion and will input to the next annual check of the evidence base and the five-year formal assessment of data and evidence. The Commission expects to publish the findings from this project in late 2025.

[9] See Section 4.5 in NRC (2022) *Advice on finalising Draft Private Native Forestry Codes of Practice*.

2.4 Protocol for landholder review of koala prescription map

Working with ecologists in the DPIRD Forest Science Unit, LLS developed a protocol for use when a landholder with an approved PNF Plan requests a review of the PNF koala prescription map on their property. The protocol was endorsed by the Forest Monitoring Steering Committee in September 2024 and published in February 2025 on the LLS website.[10]

[10] LLS (2025) *Protocol for verifying High Koala Habitat Suitability.* Accessed 13 June 2025.

3 Insights from data, monitoring and investigations

When finalised, the implementation plan will outline the indicators, monitoring and targeted investigations to deliver data and evidence aligned with the PNF MER Framework. Although the implementation plan has not been finalised, there are areas of work underway providing data and evidence related to the program's evaluation questions. **Table 3** provides an indication of progress by evaluation question in the PNF MER Framework, with details later in this chapter. Where relevant, insights from other evidence sources and research outside the program are provided.

Table 3: PNF MER Framework monitoring questions and progress

Evaluation question	Progress in 2024-25
Do the PNF codes support PNF outcomes and effective implementation?	
To what extent do agreed biophysical indicators indicate PNF outcomes are being maintained or supported? Biophysical outcomes are: ▪ maintain forest health and regeneration ▪ maintain the productive capacity of the private native forest ▪ maintain the persistence of native species ▪ maintain water quality and soil health	▪ Indicators to address this question are being developed by LLS in the implementation plan. **Maintain forest health and regeneration** ▪ Remote sensing of NSW private native forests - Application of potential indicators[11] ▪ No new canopy disturbance data for private native forestry was released by DCCEEW as part of the Statewide Landcover and Tree Study[12] (SLATS) – the most recent published SLATS dataset is for 2022. ▪ LLS commenced targeted data collection of regeneration data at sites harvested using Australian Group Selection silviculture in 2019 and 2023, and single tree selection silviculture in 2023. All sites were found to be sufficiently well stocked, and no further actions were needed to support regeneration outcomes. ▪ LLS are working with DPIRD on cross-tenure canopy disturbance research, on eastern NSW non-woodland forests, including drought impacts, using Sentinel-2 satellite imagery; future work by this project may provide insights on the PNF estate (Section 3.5). **Maintain the productive capacity of the private native forest** ▪ Landholder harvest area and volume reporting – LLS maintain public register (Section 3.1) ▪ PNF Plan and Forest Management Plan (FMP) approval reporting – LLS maintain public register (Section 3.2) ▪ Private Native Forestry Assessments: strategic yield scheduling for Cypress and Western Hardwood Region, and River Red Gum Region (Section 3.5). **Maintain the persistence of native species** ▪ Fauna monitoring and research in private native forests – includes Countryside Critters[13] program (acoustic and ultrasonic sensors and camera traps, assessing viability of AI to analyse bird recordings), before-after-harvesting

[11] Hislop S and Stone C (2024) Remote sensing of NSW private native forests - Application of potential indicators. Report prepared for the NRC.
[12] DCCEEW (2024) Statewide Landcover and Tree Study: woody vegetation clearing. Accessed 13 June 2025.
[13] DPIRD (n.d.) Countryside Critters. Accessed 14 June 2025.

Evaluation question	Progress in 2024-25
	experiment for koala, and trial drone surveys for greater glider (Section 3.3). **Maintain water quality and soil health** ▪ No specific projects delivered by the monitoring program. ▪ Journal publications on water quality and soil health reinforce the current knowledge base that roads are a source of sediment to waterways and effective management is critical to minimise impacts. The studies also add to our understanding of forest disturbance limits for soil erosion and hydrological impact.
To what extent do capacity building and socio-economic indicators associated with PNF indicate outcomes are being maintained?	▪ Indicators to address this question will be included in the implementation plan being developed by LLS. ▪ LLS developed Native Forestry Knowledge Surveys for landholders and forestry service providers and the survey instruments were released in May 2025. Data and analysis from these surveys will inform future annual progress reports.
To what extent do landholders (and contractors) understand their obligations under the PNF codes? Are they able to meet their obligations in economically and environmentally feasible ways?	▪ LLS developed Native Forestry Knowledge Surveys for landholders and forestry service providers and the survey instruments were released in May 2025. Data and analysis from these surveys will inform future annual progress reports. ▪ EPA compliance update[14] – EPA reported 11 regulatory actions were undertaken for non-compliances relating to riparian exclusion zones, roads, tracks and drainage features, planning requirements, other exclusions zones. This also included the prosecution of a landholder and two contractors relating to minimum basal area requirements not being met and insufficient habitat and recruitment trees retained.
Can PNF code conditions or the Framework be improved to better meet outcomes?	▪ The annual check of the evidence base is the primary mechanism to address this question. Annual checks have been conducted each year since the PNF codes were released. Chapter 4 summarises adaptive management actions arising from the 2024-25 evidence check.
How do landholders best meet obligations under the PNF codes and their property management objectives?	
How can landholders maintain or improve the productive capacity of their forest while also managing and protecting forest health and biodiversity?	▪ LLS commenced targeted data collection on regeneration outcomes at sites harvested using Australian Group Selection silviculture in 2019 and 2023, and single tree selection silviculture in 2023. All sites were found to be sufficiently well stocked, and no further actions were needed to support regeneration outcomes. ▪ LLS developed Native Forestry Knowledge Surveys for landholders and forestry service providers and the survey instruments were released in May 2025. Data and analysis from these surveys will inform future annual progress reports.

[14] EPA (2025) Native forestry compliance update: Native forestry operations on private land. Accessed 13 June 2025.

Evaluation question	Progress in 2024-25
	▪ LLS has partnered with North East Forestry Hub to investigate barriers and enablers to landholder participation in PNF, silviculture management, and group certification schemes in the North East region. Early work is identifying ways to make PNF future fit. ▪ LLS has partnered with the South East Forestry Hub and the Bega Local Aboriginal Land Council to pilot a study into Aboriginal management of native forest. ▪ LLS is working with DPIRD to investigate the carbon benefits of active management of degraded PNF coastal forests in Northern NSW – research progress update ▪ LLS Forest Stewardship Pilot Report – pilot evaluation
Do the PNF codes address principles of ecologically sustainable forest management?	
To what extent do the PNF codes satisfy the principles of ecologically sustainable forest management (ESFM)? Can they be improved to better address ESFM?	▪ This question will be considered in the five-year formal assessment of data and evidence and as required to meet reporting obligations associated with Regional Forest Agreements and Australia's State of the Forests Report.
To what extent do the PNF codes provide adequate protection for threatened species?	▪ Risk-based review of threatened species protections in Appendix A of the PNF codes is in progress – this work is in the final stage considering further mitigations for identified species. ▪ Process to verify and improve the PNF koala prescription map and underlying models is in progress. Key areas delivered include: - evaluating the existing PNF koala prescription map[15] - protocol for verifying high Koala habitat suitability[16] - outputs from the draft koala habitat suitability model developed by DCCEEW are now being reviewed. ▪ The Commission anticipate these projects will feed into the next annual check of the evidence base for 2025-26 and the formal five-year assessment of data and evidence.

3.1 Landholder reported harvest data varies between years

The PNF codes released in May 2022 require PNF Plan holders to submit a completion notification to LLS following forestry operations. The completion notification must include the approximate volume and area of harvest.

In 2024-25 (as of 30 June 2025), LLS received 124 completion notifications from landholders, compared to 120 notifications in 2023-24. **Table 4** provides the area and volume of harvest by relevant PNF code reported in these notifications for the period 2022-23 to 2024-25. Of note, in 2024-25 LLS did not receive completion notifications for PNF operations in the Cypress and Western Hardwoods region and received only one completion notification for PNF operations in the River Red Gum region. LLS advise River Red Gum operations are continuing for periods greater than a single year, such that reported harvest areas and volumes do not reflect annual activity levels.

[15] Elith J (2024) Evaluating the existing PNF koala prescription map. Report prepared for the NRC.
[16] LLS (2025) Protocol for verifying high Koala habitat suitability.

Table 4: 2022-23 to 2024-25 landholder reported harvest data

PNF Code	Volume harvested (cubic metres)			Area harvested (hectares)		
	2022-23	2023-24	2024-25	2022-23	2023-24	2024-25
Northern NSW	83,314	100,661	80,947	5,516	6,518	6,200
Southern NSW	21,250	86,855	27,536	185	1,166	379
River Red Gum	-	19,700	18,500	-	200	100
Cypress & Western Hardwood	1,100	-	-	148	-	-
Total	**105,664**	**207,216**	**126,983**	**5,849**	**7,884**	**6,679**

***Table note**: 2024-25 data supplied by LLS on 7 July 2025 as of 30 June 2025. Completion notifications are reported via several methods, and the data provided is not third party verified and is subjective in nature.*

The accuracy and completeness of this harvest area and volume data is not known as they are estimates reported by PNF Plan holders. In addition, it is not known if all operations that occurred in the financial year submitted completion notifications. Over time, other datasets may provide evidence to better understand this data quality.

Natural disasters impacted the ability of landholders to undertake private native forestry operations in 2025. This included Tropical Cyclone Albert in March and widespread flooding in coastal regions in May, which had marked impacts on northern NSW forestry operations.

When available, the canopy loss (harvest area) attributed to PNF by the Statewide Landcover and Tree Study (SLATS) for 2023, 2024 and 2025 will be compared with landholder harvest area estimates. SLATS uses Sentinel-2 satellite imagery to estimate annual rates of woody vegetation clearing across NSW. The most recent published SLATS data for canopy disturbance[17] (harvest area) attributed to PNF is provided in **Table 5**. In 2022 there was an estimated 966 hectares of harvesting in private native forests; by comparison the total area of woody vegetation disturbance was over 21,000 hectares[18] (where disturbance could be from harvesting, permanent clearing, or woody regrowth clearing, but excludes natural processes, such as fire, landslide, storm, and dieback).

Table 5: Statewide area of canopy disturbance attributed to PNF harvest by the SLATS

Year	2018	2019	2020	2021	2022
Area (ha)	1,147	949	1,983	1,587	966

***Source**: 2022 NSW Vegetation Clearing Data (DCCEEW 2024)*

Other estimates of PNF harvest areas and volumes were reported in the 2023-24 PNF MER Annual Progress Report.[19]

To provide some scale to PNF operations relative to public native forestry in NSW, the harvest volume and area of public native forestry operations in 2023-24 was 541,000 cubic metres and 14,850 hectares respectively.[20]

17 DCCEEW (2024) 2022 NSW vegetation clearing report.
18 DCCEEW (2024) 2022 NSW Vegetation Clearing Data.
19 NRC (2024) PNF Monitoring Program Annual Progress Report 2023-24.
20 Forestry Corporation of NSW (n.d) Sustainability Report 2023-24. Accessed 11 June 2025.

3.2 PNF approvals remain high in 2024-25

In 2024-25, LLS approved 300 PNF plans over an area of 73,196 hectares, with over 70 percent by area issued under the Northern NSW PNF Code of Practice. This is a decrease in area of approvals from the 84,945 hectares in 2023-24. LLS advise that approvals in any year are highly variable and can be influenced by many factors including farm commodity prices, demand for sawn timber product, forest conditions or other factors.

Figure 2 shows a density or heat map of PNF approvals in 2024-25. Approvals were primarily in the Northern PNF code.

In 2023-24 and 2024-25 approvals also included reapprovals of expiring PNF plans. PNF approvals are granted for 15 years, and the first approvals made in 2008 when the original PNF codes were introduced expired in 2023. As of 30 April 2025, 14 percent (8,276 hectares) of all expired PNF approval areas had been re-approved.[21]

LLS report that as of 30 June 2025 there are 4,202 approved PNF plans covering 690,380 hectares.[22] In comparison, the area of public native state forest available for harvesting in 2023-24 was 1.1 million hectares.[23]

While PNF approval areas do not represent the net harvestable area or actual levels of harvesting, and some approvals may never be activated, the total approved area does indicate significant capacity to supply forest products.

A recent private native forestry sector report indicates there has been an increase in demand for firewood as the public native forest harvesting winds down in Victoria.[24] The report suggested that the commercial return from firewood could help to support viable sustainable forest management on private land activities including silvicultural treatments and sawlog harvesting. In addition, the report noted that landholders in central and western NSW are being approached by Queensland traders and exporters seeking to meet export demand for native cypress pine (primarily *Callitris glaucophylla*), with logs from inland regions often transported over 200 kilometres by rail to the coast for processing or shipment. The report also identified around 4.4 million hectares of private native forest in NSW that either is being managed for or has the potential to be managed for PNF.

However, there are some challenges to realising supply potential from the PNF estate in NSW. This includes a history of high grading – where most of the merchantable trees are harvested and the rest are left – leaving them with non-commercial (unmerchantable) stems and reducing the productive value of forests.[25] Further, NSW sawmill representatives interviewed for a recent national study indicated it was widely accepted that obtaining sawlogs from private native forests in NSW was becoming increasingly challenging due to

21 LLS (2025) Annual check of the Private Native Forestry evidence base 2024-25 submission. Unpublished report submitted to the Natural Resources Commission for the 2024-25 Annual Check of the Evidence Base for PNF.

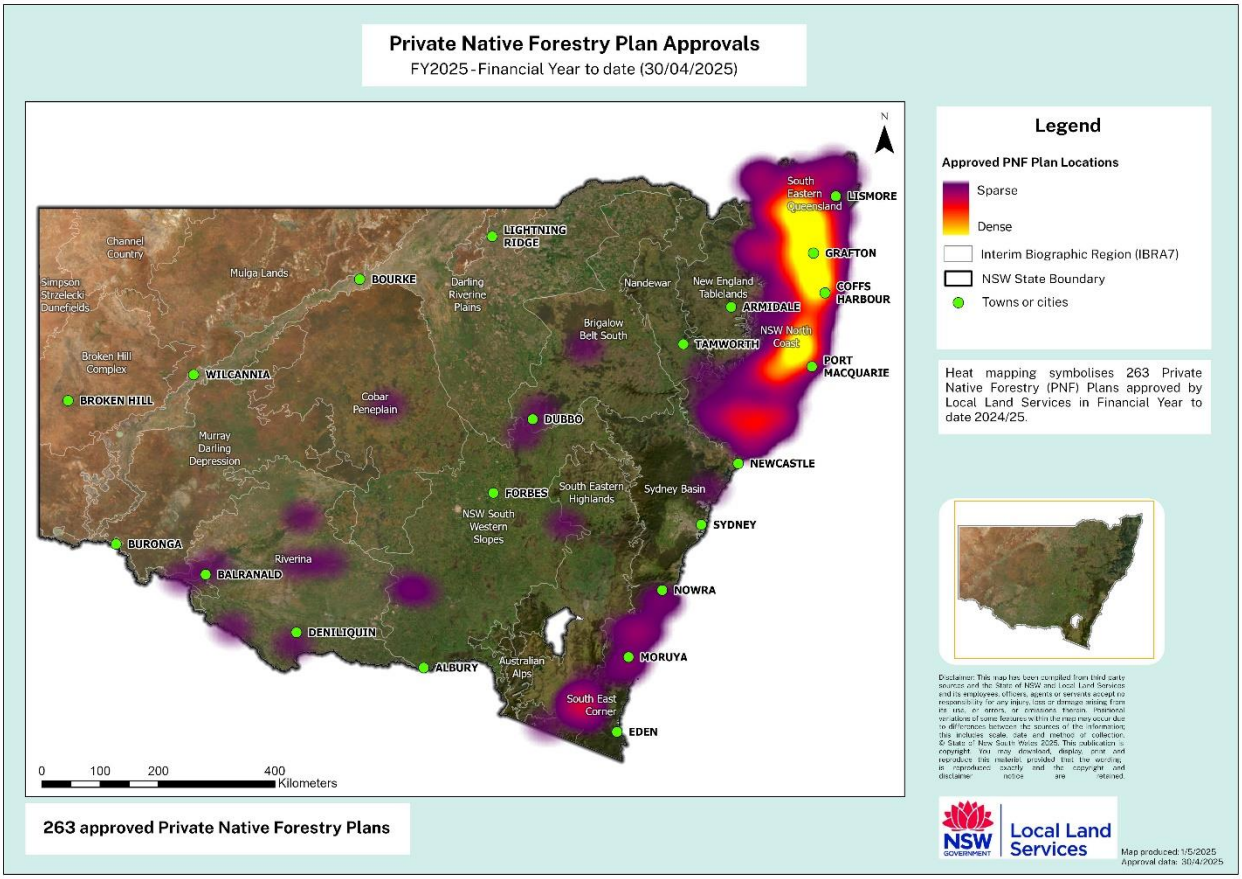
22 Personal communication, Local Land Services, 7 July 2025.

23 Forestry Corporation of NSW (n.d) Sustainability Report 2023-24. Accessed 11 June 2025.

24 Howell C, Lehmann C, Daian M, Wood P and Read S (2025) Forest inventory for private native forestry, farm forestry and Indigenous forestry: Private native forestry sector report. ABARES Research Report, Canberra, March 2025. doi.org/10.25814/ryqg-4975. CC BY 4.0.

25 Lewis T, Venn T, Francis B, Ryan S, Brawner J, Cameron N, Kelly A, Menzies T, Schulke B (2020) Improving productivity of the private native forest resource in southern Queensland and northern New South Wales, Forest and Wood Products Australia Limited, Melbourne, April 2020.

legislative requirements and the time and issues arising during the approval process, which were cited as an economic disincentive.[26]



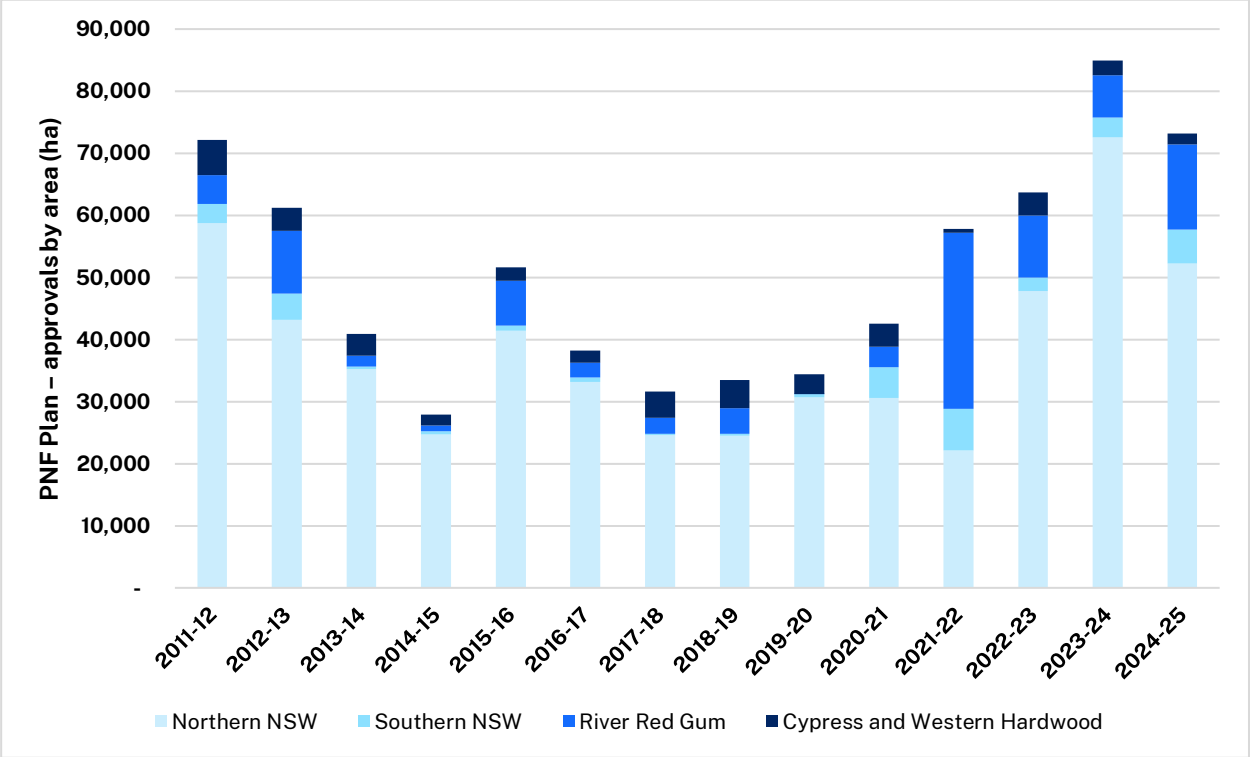
***Source**: Local Land Services submission to the PNF MER annual check of the evidence base 2024-25.*

Figure 2: Private Native Forestry plan approvals 2024-25

Figure 3 illustrates the area of PNF approvals from 2011-12 to 2024-25. It shows there has generally been an increasing trend in PNF approvals (by area) from a low in 2017-18 to a high in 2023-24, and a return to more modest approval rates in 2024-25. LLS advise the reasons for the increasing trend in PNF approvals is not fully understood but contributing factors may include:

- challenging weather conditions (including drought and floods) prompting forest owners to draw on forestry as a supplementary income source to agriculture
- reduced supply from public native forests following the 2019-20 fires creating increased demand to meet supply shortfalls from private native forests
- LLS advice and support services raising landowner awareness and capacity to participate in PNF.

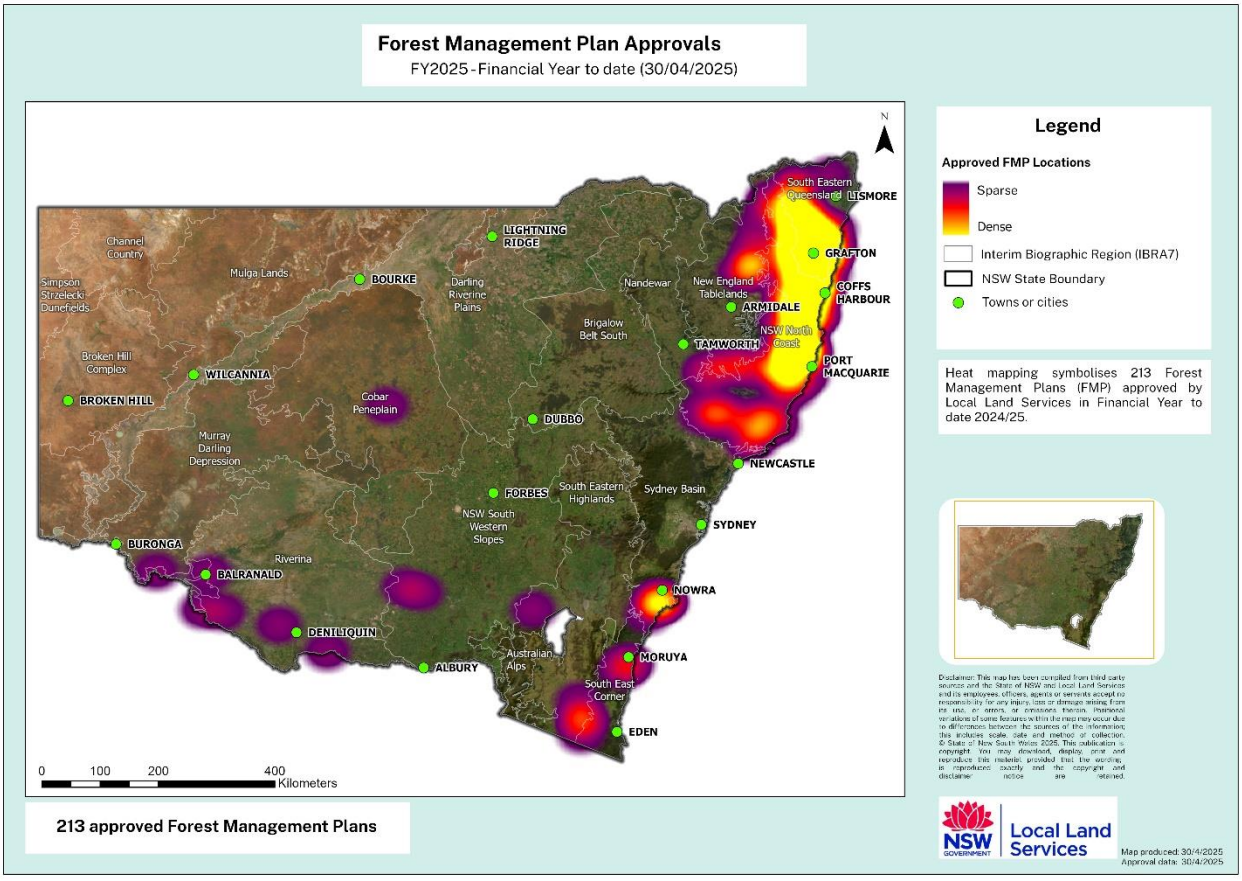
26 Howell C, Lehmann C, Daian M, Wood P and Read S (2025) Forest inventory for private native forestry, farm forestry and Indigenous forestry: Private native forestry sector report. ABARES Research Report, Canberra, March 2025. doi.org/10.25814/ryqg-4975. CC BY 4.0.



***Source**: Public register data on LLS webpage Monitoring, Evaluation and Reporting; Local Land Services submission to the PNF MER annual check of the evidence base 2024-25, PNF approvals as of 30 June 2025.*

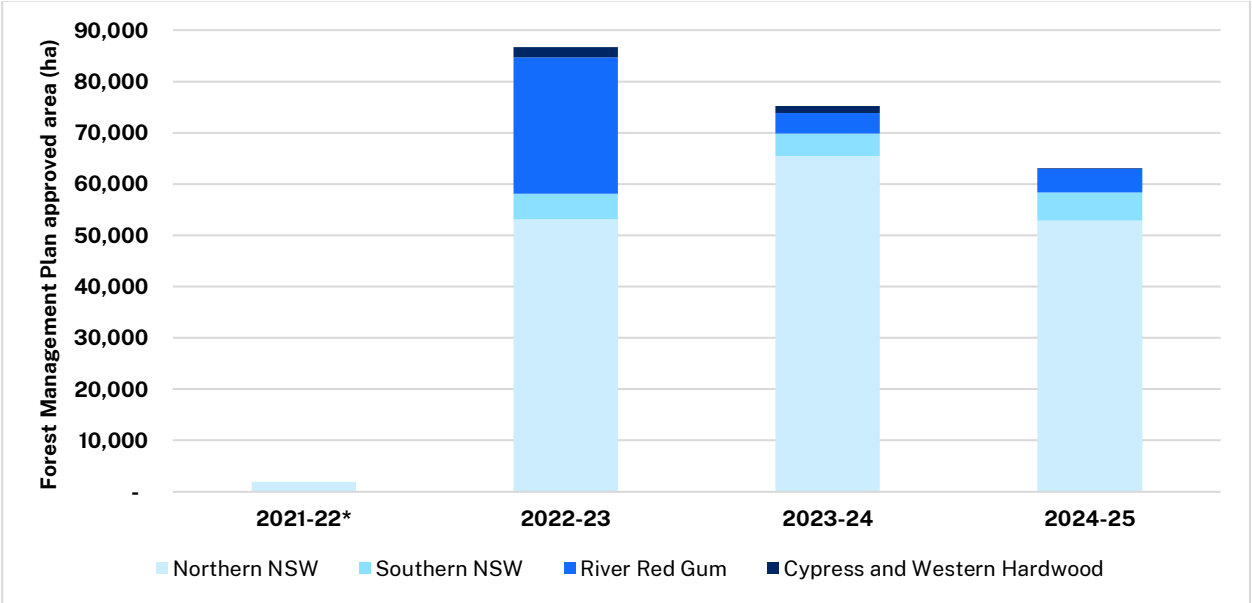
Figure 3: Private Native Forestry plan approvals from 2011-12 to 2024-25

The PNF codes released in May 2022 introduced a new requirement for PNF approvals to prepare a Forest Management Plan, unless the PNF approval is for small scale harvesting (no more than five trees per hectare). LLS approved 249 Forest Management Plans in 2024-25 covering 63,155 hectares, primarily in the Northern and Southern PNF code regions. **Figure 4** shows the locations of approved Forest Management Plans for 2024-25. **Figure 5** shows the Forest Management Plans area approved since May 2022.



***Source**: Local Land Services submission to the PNF MER annual check of the evidence base 2024-25.*

Figure 4: Forest Management Plan approvals 2024-25



***Source**: Public register data on LLS webpage Monitoring, Evaluation and Reporting; Local Land Services submission to the PNF MER annual check of the evidence base 2024-25, FMP approvals as of 30 June 2025.*

Figure 5: Forest Management Plan approvals from *May 2022 to 2024-25

3.3 Fauna surveys are building the evidence base in private forests

LLS is working with the DPIRD Forest Science Unit who have been monitoring koalas on private land since 2019. The DPIRD program, Countryside Critters (formerly Countryside Koalas), was established under the NSW Koala Strategy using acoustic survey methods to provide a snapshot of koala occupancy across private forests in north east NSW.[27] Research has found that acoustic recorders are the most cost effective method for quantifying koala occupancy.[28] The acoustic survey method relies on recording koala bellows made by the males during the spring breeding season. As of spring 2024, monitoring is in its sixth year and data are now being analysed to assess the trend in koala occupancy over that time.

As part of work being funded by LLS, DPIRD is now using Artificial Intelligence (AI) call recognisers to reanalyse the acoustic archive and consider occupancy trends for a further 10 species:

- yellow-bellied glider
- sugar glider
- squirrel glider
- powerful owl
- sooty owl
- masked owl
- barking owl
- boobook owl
- grey-headed flying fox
- glossy black cockatoo.

In 2024, DPIRD ecologists deployed ultrasonic bat detectors and camera traps for the first time in this program. The 2024 camera trap images have been tagged, identifying 58 species including native and invasives. The common brushtail possum (*Trichosurus vulpecula*) and red necked wallaby (*Notamacropus rufogriseus*) were amongst the species with the highest number of site detections. DPIRD is currently analysing data from the bat recordings.

Using acoustic data DPIRD assessed the naïve occupancy (number of site detections) for nine species over five years (2019-2023). Detection of these species indicates they are persisting post-fire in the private native forest estate and koala naïve occupancy is showing an increasing trajectory. However, further work is needed to account for annual differences in the probability of detection and variation in environmental covariates (such as koala habitat suitability). DPIRD are undertaking further data processing and full occupancy modelling is scheduled for 2026. The results will be discussed in future annual progress reports.

To better understand the effects of harvesting LLS is conducting two before-after-control-impact (BACI) experiments, one for koalas and one for southern greater gliders. The koala BACI experiment data collection is well underway, with final post-harvest acoustic surveys planned for spring 2026. Acoustic data from completed surveys have been processed and

[27] DPIRD (n.d.) Countryside Critters.

[28] Beranek C T, Southwell D, Jessop T S, Hope B, Gama V F, Gallahar N, Webb E, Law B, McIlwee A, Wood J, Roff A and Gillespie G (2024) 'Comparing the cost-effectiveness of drones, camera trapping and passive acoustic recorders in detecting changes in koala occupancy', *Ecology and Evolution*, 14(7), e11659.

validated. The results to-date show that koala density estimated between years is similar, suggesting no detectable impact of harvesting based on the sites analysed. The greater glider BACI experiment is using thermal drone surveys for which detection is best during winter. Pre-harvest surveys for the greater glider BACI experiment are planned for winter 2025 and post-harvest surveys are expected to be completed in winter 2026.

3.4 Other forest research highlights key issues and forest recovery after disturbance

In addition to the data and evidence generated for private native forests and PNF, the program also considers other forest and forestry monitoring and research. These evidence sources may provide insights on threats to and trends in forest values and outcomes of relevance to PNF.

Water quality and soil health

The PNF MER Framework acknowledges the difficulty in monitoring water quality and soil health across the PNF estate. The remote sensing feasibility study highlighted that accurate monitoring of water quality and soil health requires on ground sampling.[29] Further, the study noted the high cost to acquire and analyse remote sensing data of sufficient resolution to support understanding localised impacts of sediment and protecting drainage features.

Noting these limitations, the Framework also recognises the significant and mature scientific knowledge base for protecting waterways during forestry operations, such as riparian exclusion zones, and track and drainage provisions.

Studies published in 2024-25 further expand the existing water quality and soil health knowledge base and highlight the potential impact of soil erosion. One study investigated the critical disturbance level in forested landscapes above which significant hydrological impact can be detected.[30] The authors argue that establishing forest disturbance thresholds can provide a practical guide for designing management strategies to avoid significant and cumulative changes in hydrological processes and functions. The study reported that watersheds with more diverse ecosystems and vegetation types have higher disturbance thresholds. Another study investigated soil erosion rates after wildfire, which are strongly controlled by topography, weather, climate, soil, and vegetation. The study proposed a conceptual model to help identify areas most vulnerable to post-fire erosion changes.[31]

Other studies have highlighted the impacts the number of stream crossings and length of unsealed roads have on both the water quality and in-stream ecology, which is relevant for almost all forests subject to harvesting operations. One study emphasised the inevitability of erosion from unsealed forest roads and highlighted the need for effective road management and restoration.[32] It proposed integrating best management practices and ecosystem restoration strategies into watershed management, combined with advanced technological approaches, to foster sustainable watershed development. This was

29 Hislop, S. and Stone, C. (2023) Remote sensing of NSW private native forests – options and feasibility. A report prepared for the NRC.

30 Hou Y and Wei X (2024) 'Forest disturbance thresholds and cumulative hydrological impacts', *Water Resources Research*, *60*(5), e2024WR037339.

31 Noske P J, Nyman P, Lane P N, Rengers F K and Sheridan G J (2024) 'Changes in soil erosion caused by wildfire: A conceptual biogeographic model', *Geomorphology*, 459, 109272.

32 Yu Z, Zhao Q, Liu Y, Yu J, Wang A and Ding S (2024) 'Soil erosion associated with roads—A global review and statistical analysis', *Land Degradation & Development*, *35*(11), 3509-3522.

supported by a north American study[33] looking at unsealed roads which indicated negative relationships between increasing road densities and sediment size distributions. However, the study noted that detecting road effects at site scales will be challenging given the effects of covariates (landscape, climate, locality) that can overwhelm sediment signals.

While it is currently cost prohibitive to accurately map unsealed roads and tracks across the PNF estate, the findings from the above study supports the need for advice and support services to landholders targeting proper maintenance of roads, tracks and drainage infrastructure. This would help to support the PNF outcome of 'maintain water quality and soil health at the site and landscape scale'. Understanding disturbance thresholds and links to changes in hydrological function and processes in the PNF estate, would support analysis following unforeseen events (e.g. fire or mass dieback), as required under clause 4.3(5) of the PNF codes.

Disturbance response

Various studies continue to be released documenting the impacts and recovery of forests following the 2019-20 fires and preceding drought. While these studies are not specific to the PNF estate, they do provide NSW research and potential insights on recovery across the PNF estate.

The Coastal Integrate Forestry Operations Approval (IFOA) monitoring program (relates to public native forestry in the coastal state forests of NSW) published a review of forest recovery following the 2019-20 wildfires.[34] The study found that overall levels of tree mortality, topkill and recruitment post-2019-20 were similar to previous fire seasons, however the forest area affected was far greater and led to higher levels of tree death and tree crown death at a regional scale. High levels of tree and tree crown death were generally restricted to areas burnt at high or extreme severity. Tree and tree crown death were also more likely for small and large trees, and trees with pre-existing basal injuries. The compound impact of the preceding drought and 2019-20 fires may have led to demographic change to forests. High seedling numbers and growth in the years following the fires were likely due to above-average rainfall.

Other studies also illustrate the impact of fire, drought or harvesting related disturbances on native forests and habitat.

LLS has engaged DPIRD to deliver cross-tenure canopy disturbance research across the non-woodland forests of NSW using satellite-derived imagery. Preliminary, unpublished progress reporting supplied by LLS for the 2024-25 annual check of the evidence base indicates that during March 2024 to August 2024 a total of 4.3 percent of the native forest area was impacted by canopy change in the 10 eastern most bioregions of NSW, equivalent to over 588,000 hectares out of 13.6 million hectares. During this period, 2.3 percent of the native forest area in these bioregions were impacted by bushfires, 1.7 percent were in drought and 0.3 percent were impacted by harvesting and clearing. The native forest area impacted by drought varied across tenures, with 2.5 percent impacted in private property, 0.8 percent impacted in state forest and 0.8 percent impacted in national parks.

[33] Al-Chokhachy R, Poole G, Thomas C, Saunders C, Roper B, Hendrickson S, Davis C, Crapster K and Archer E (2025) 'The Effects of Unpaved Roads on Instream Sediment: Patterns and Challenges for Monitoring', *JAWRA Journal of the American Water Resources Association*, 61(2), e70006.

[34] Western Sydney University (2024) Review of forest recovery in CIFOA region following 2019-20 wildfires. Report prepared for the NRC.

The Coastal IFOA monitoring program recently developed and tested a new method to quantify and monitor canopy dieback in coastal NSW public forests.[35] The method uses PlanetScope and Sentinel-2 satellite imagery and a machine learning approach. The pilot tested the method in eucalypt dominated forests of the NSW north coast affected by the severe early-season drought in September to October 2023. In these forests, there was a strong relationship between canopy dieback and ridges and north-facing slopes. These landscape features receive more sun and have lower soil moisture retention, which increases drought stress. The pilot also found that areas previously impacted by Bell Miner Associated Dieback (BMAD) had high levels of canopy dieback, but the area affected was small compared to other factors associated with canopy dieback (1.3 percent of the total area of canopy dieback in the pilot study area). Previous fire history also played a significant role in shaping dieback patterns, suggesting a legacy effect from past disturbance.

Other research under the Coastal IFOA monitoring program has demonstrated that Light Detection and Ranging (LiDAR) data, metrics and modelling can be used to determine changes in forest characteristics and describe forest recovery.[36] The findings from the research case studies included that after harvesting canopy top height and canopy coverage recover across a range of slope classes, comparable canopy regrowth rates are seen across harvesting intensities and potential similarities are seen in the canopy structure of areas managed for timber production and areas managed for conservation.

Supplementary products released by the NSW Biodiversity Indicator Program[37] provide more detail on the significant pressures on biodiversity in forests following the 2019-20 fires, building on the outlook report released in 2024. These supplementary reports indicate that the vegetation types with the greatest reduction in ecological carrying capacity after the 2019-20 bushfires included wet sclerophyll forest and dry sclerophyll forests.

Biodiversity response and recovery following disturbance

Fauna monitoring research under the Coastal IFOA monitoring program assessed the effects of disturbance on occupancy of the southern brown bandicoot (*Isoodon obesulus obesulus*) between 2009 to 2023,[38] and the yellow-bellied glider (*Petaurus australis*) between 1995 to 2023.[39] Disturbance effects considered included harvesting, fire and drought. These studies found:

- Southern brown bandicoot occupancy declined from the start of the study to a low in 2019 and 2020 at the peak of a major drought and immediately after the 2019-20 fires. Major rain events between 2020-2023 led to a sharp rise in occupancy so that in 2023 all survey sites were occupied. There was no detectable impact on occupancy from harvesting.
- Yellow-bellied glider occupancy was generally low in the Bago plateau over 25 years up to 2019. Following the 2019-20 fires there was an immediate ten percent reduction, followed by a dramatic increase in 2022 and 2023 during years of above

35 Choat, B., Nolan, R. H., Quan, X., Gibson, R.K. (2025) Quantification and Monitoring of Sudden Canopy Dieback in Forests of the North Coast of NSW, Prepared by the Hawkesbury Institute for the Environment, Western Sydney University, for the NRC as part of the Coastal IFOA monitoring program.
36 University of Newcastle (2024) Monitoring forestry outcomes using airborne LiDAR - Stage 2 Report. Report prepared for the NRC.
37 DCCEEW (2024) Results from the Biodiversity Indicator Program.
38 Gonsalves L and Law B (2025) Occupancy trend analysis for Southern Brown Bandicoot in Eden, New South Wales. DPIRD report prepared for the NRC.
39 Gonsalves L and Law B (2025) Yellow-bellied Glider Occupancy Trends on the Bago Plateau (1995 - 2023). DPIRD report prepared for the NRC.

average rainfall. Researchers found harvesting was not associated with the trend in occupancy for yellow-bellied gliders.

While this research analysed southern brown bandicoot and yellow-bellied glider occupancy trends in state forests, the recovery in species occupancy seen following significant rainfall, likely due to increased habitat condition and availability of resources, and the minor influence that harvesting disturbance had, provides insights for fauna recovery following disturbance in the PNF estate.

The response of these two species to drought and fire disturbance is consistent with an Australia-wide study of more than 2,000 species, which investigated the cumulative impacts of fires on biodiversity following the 2019-20 fires.[40] This work found that the largest effects on flora and fauna were in areas with frequent or recent past fires and within extensively burnt areas, as well as in areas burnt at high severity, outside of protected areas or that were under extreme drought conditions.

The higher risk for species persistence outside protected areas was supported by another Australia-wide study that assessed 305 critically endangered species with narrow geographic ranges, which makes them particularly vulnerable to disturbance.[41] The study found that around half of the species' habitats are outside the protected area estate, including the entire distribution of 39 species.

Another key area of research is seeking to understand how the persistence and abundance of hollow-bearing trees respond to disturbance. Hollows are a critical habitat resource for many forest dependent species, including the greater glider. A recent study in south-eastern Australia has predicted that the number of hollow-bearing trees declines with increasing fire frequency, where there is a high rate of tree collapse or removal, or where there aren't sufficient mature trees in which the fires could cause new hollows to form.[42] A Victorian study investigated hollow occurrence and abundance both before and after the fires, finding that tree size and shape, as well as site productivity and topography, were important predictors for of hollow occurrence.[43] Further, fire significantly reduced hollow abundance, but did not significantly affect hollow occurrence. The study also found that fire altered the relationship between tree size and hollow occurrence, with a higher likelihood of hollow occurrence in smaller tree sizes after the fires.

Other research in NSW has assessed the cumulative impact of historic deforestation and degradation (1788-2021) and recent harvesting (2000-2022) on threatened species.[44] The researchers found that out of the 269 species assessed, 150 species have potentially been impacted but the impacts varied across species. It also identified that 43 of the species impacted by historic deforestation and degradation and recent harvesting have 50 percent or less of their pre-1788 distribution intact.

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40 Driscoll D A, Macdonald K J, Gibson R K, Doherty TS, Nimmo DG, Nolan R H, Ritchie E G, Williamson G J, Heard G W, Tasker E M and Bilney R (2024) 'Biodiversity impacts of the 2019–2020 Australian megafires', *Nature*, 1-8.

41 Ward M, Maron M, Simmonds J S, Lintermans M, Whiterod N S, Chapple D G, Possingham H P, Legge S M, Gallagher R V, Wintle B A and Vine S (2025) 'Half of the habitat of Australia's highly imperilled narrow-range species is outside protected areas', *Biological Conservation*, 111195.

42 Gibbons P, Stojanovic D, Lindenmayer D B and Owens G (2024) 'Impacts of changing fire regimes on hollow-bearing trees in south-eastern Australia', *International Journal of Wildland Fire*, 33(2).

43 Wagner B, Baker P and Nitschke C (2024) 'How an unprecedented wildfire shaped tree hollow occurrence and abundance — implications for arboreal fauna.' *Fire Ecology*, *20*(1), p.42.

44 Ward M, Ashman K, Lindenmayer D B, Legge S, Kindler G, Cadman T, Fletcher R, Whiterod N, Lintermans M, Zylstra P and Stewart R (2024) 'Shifting baselines clarify the impact of contemporary logging on forest-dependent threatened species', *Conservation Science and Practice*, 6(9), e13185.

These studies emphasise the importance of species prescriptions, monitoring and forest management to maintain the persistence of native species, including in the PNF estate.

Threatened species listings

In 2024-25, 37 flora and fauna species were listed or uplisted in NSW.[45] While not all listed or uplisted species are forest dependent or impacted by PNF, it is important that new listings are considered at the appropriate time. The PNF codes contain additional species-specific protections for some threatened species, however the listed species in the codes are static until adjusted by a PNF code review initiated by the Minister responsible for the codes. The annual check of the evidence base notes these species for consideration as part of the five-year formal assessment of data and evidence.

In addition, LLS is developing a new guideline to incorporate threatened species listings since May 2022 into PNF approvals. The purpose of the guideline is to promote adoption of forestry practices that mitigate harm to threatened species (including their habitats) listed after May 2022. The guideline would be implemented on a voluntary basis (i.e. a landholder may decide not to implement the guideline) from the date of approval to 30 June 2027 and is expected to apply only where there is a record of a threatened species. The guideline will outline exclusion zones and buffer zones requiring additional tree retention requirements, or other measures. LLS do not anticipate an additional regulatory burden on landholders and persons carrying out forestry operations by the adoption of these guidelines.

Forest carbon

A recent study has reviewed the net carbon dioxide emission implications of harvesting in Australian native forests and found that well managed harvesting in carefully selected parts of the landscape can provide sustainable ongoing carbon benefits.[46] The researchers found that the carbon emissions from harvesting are offset by the sequestration of carbon in new regrowth and the benefits of using harvested wood.

Other research has investigated the potential for increased involvement of the forest sector in the Australian carbon market.[47] The study found there is extensive participation in the international markets, and suggest that the types of forest sector projects contributing to the Australian carbon market could be significantly expanded on by revisiting existing methods, developing new methods and increasing participation in international voluntary methods.

Building the knowledge base around the potential carbon benefits in forestry, as well as the barriers and pathways to participation in the carbon market, can help support maintaining the health and productive capacity of private native forests and support the economic resilience of landholders through diversification.

3.5 Complementary projects contribute to the evidence base

The PNF MER Framework recognises the importance of maintaining strong connections with the LLS Farm Forestry Program. The LLS Farm Forestry Program is responsible for approvals under the PNF codes and provides advice and support services to PNF landholders. While not directly part of PNF MER implementation, work that the LLS Farm

45 NSW Threatened Species Scientific Committee (2025) Final determinations.
46 Raison R J (2024) 'A review of the impacts of sustainable harvesting, non-harvest management and wildfire on net carbon emissions from Australian native forests', *Australian Forestry*, *87*(4), 176-194.
47 Suitor S, Hadley D and Ximenes F (2025) 'Options for Forest Sector Participation in International Carbon Markets: Unlocking the Carbon Market Potential of Australia's Forest Sector', *Land*, 14(3), 473.

Forestry Program is delivering contributes to the PNF evidence base and will provide insights for the monitoring program.

Research

LLS is funding DPIRD to undertake carbon and cross-tenure canopy disturbance research. The carbon research will inform an assessment of the effectiveness of silvicultural and other conditions of the PNF Codes in maintaining the health and productive capacity of private native forests, focusing on the Northern PNF Code region. Provision to reward the potential carbon benefits of active management of degraded native forests may also be established. In the first phase of the project five trial sites have been identified in north east NSW private native forest where silvicultural treatment could lead to improved production and carbon outcomes. The researchers will look at non-commercial thinning, Australian Group Selection and weed removal, and consider forest type and condition. Data collected at each site will include standard inventory metrics, carbon and fauna data, fire history and forest structure data. The project will also test a mobile unit to produce biomass or biochar onsite. An independent forest consultant will ensure operations are consistent with the PNF code.

The cross-tenure canopy disturbance research will provide the basis for producing regular modelled canopy disturbance products across the non-woodland forests of NSW. This information will help inform and support recommendations from LLS to Ministers regarding if harvest operations should be suspended or rescheduled following an unforeseen event (such as wildfire, mass dieback or a forest biosecurity event) that may cause serious or irreversible environmental damage on private land at a bioregional scale.

DPIRD prepared a progress report on the canopy disturbance project, which highlighted that during March 2024 to August 2024 a total of 4.3 percent of the native forest area was impacted by canopy change in the 10 eastern most bioregions of NSW, equivalent to over 588,000 hectares out of 13.6 million hectares. During this period, 2.3 percent of the native forest area in these bioregions were impacted by bushfires, 1.7 percent were in drought and 0.3 percent were impacted by harvesting and clearing. The native forest area impacted by drought varied across tenures, with 2.5 percent impacted in private property, 0.8 percent impacted in state forest and 0.8 impacted in national parks.

Investigations

LLS funded experts at the Australian National University to complete desktop assessments of hypothetical maximum non-declining yields from private native forests in the River Red Gum and Cypress and Western Hardwood PNF Code regions. The researchers modelled estimates revealed:

- under the River Red Gum PNF Code, up to 1 million cubic metres per 5-year period of merchantable volume could be produced for the next 50 years for various products including firewood and furniture
- under the Cypress and Western Hardwood PNF Code, up to 2 million cubic metres per 5-year period of merchantable volume could be produced for the next 25 years, after which the yield would decrease and merchantable volume could be up to about 1.2 million cubic metres per 5-year period, however the product quality may be improved.

These findings strongly indicate that current harvesting levels authorised under the River Red Gum and Cypress and Western Hardwood PNF Codes are well below maximum hypothetical yields.

Linked to the canopy disturbance research mentioned above, LLS is also funding a threshold analysis to help inform and support LLS decisions to suspend or reschedule harvest operations following an unforeseen event.

This work is also considering whether results from the Coastal Integrated Forestry Operations Approval (IFOA) Monitoring Program, structured around the high priority conditions are likely to be directly transferable to PNF MER.

Capacity building

A recent report on the private native forestry sector in Australia, highlighted the need for greater coordination of information across the private native forestry sector, including between landholders, forest industry and government, and the need for well resourced, ongoing PNF monitoring systems with more transparent sharing of information.[48] As noted in the PNF MER Framework, the LLS Farm Forestry Program provides advice and support services to landholders, and these are critical to achieving the outcomes under the PNF codes.

LLS engaged Universal Forest Systems to develop forest assessment tools including a regeneration assessment method for LLS staff, pre- and post-harvest inventory assessment methodology and database, and to scope data capture options. These tools will support LLS to capture, evaluate, report and store quality data relating to silvicultural treatments, forest regeneration and yields.

LLS has developed two National Forestry Knowledge Surveys, one for landholders and one for forestry service providers, that will be used to understand the effectiveness of capacity building activities. These survey instruments were released in May 2025. As well as these targeted annual surveys, LLS monitor attendance at capacity building events.

In 2024-25, LLS sponsored seven field days and a single training course (the Master Tree Grower course), and presented at four workshops and one community group, attracting over 135 participants and covering topics such as:

- introduction to PNF
- tree measurement and management, including eucalypt ecology
- products and markets
- native forest silviculture, including legislation requirements, planning and harvesting.

Forest Stewardship Pilot

The Forest Stewardship Pilot was a non-competitive grant scheme designed to incentivise landholders of private native forests in NSW to engage in forest stewardship through financial incentive, forest planning assistance and ongoing extension and support. The pilot operated between October 2022 to June 2024 and awarded grants to 43 landholders, including two Local Aboriginal Land Councils and one Aboriginal co-managed property.

Forest stewardship activities included in the pilot covered stand management, ecosystem management, fire management, roads and infrastructure, pest and weed control, cultural heritage, and education and training.

[48] Howell C, Lehmann C, Daian M, Wood P and Read S (2025) Forest inventory for private native forestry, farm forestry and Indigenous forestry: Private native forestry sector report. ABARES Research Report.

LLS prepared an evaluation of the pilot in January 2025. The evaluation found that integration of financial support and extension services significantly enhanced landholder participation, and the approach significantly enhanced landholder capacity for forest management. Tailored extension helped participants make information decisions and increased confidence in making forest management decisions. The Forest Stewardship Pilot design could be scaled up to deliver an expanded program.

Aboriginal forest management

LLS has partnered with the South East NSW Forestry Hub and the Bega Local Aboriginal Land Council (LALC) to pilot a study into Aboriginal management of native forest. The project will:

- develop a Cultural Management Plan, to identify key principles to be considered in a forest management plan for it to be culturally, socially, environmentally and economically successful and assess the feasibility of these principles
- assess the forest management capacity within Bega LALC, identifying gaps and opportunities
- explore support structures to realise and implement the Cultural Management Plan.

4 Annual check of the evidence base

A key adaptive management approach adopted for the PNF Monitoring Program is to conduct annual checks to ensure the evidence base, including maps, is up to date, identify emerging evidence from monitoring and research, and opportunities for improvement.

The annual check considers multiple lines of evidence to identify:

- emerging evidence around private native forestry from monitoring, evaluation and research generated by the PNF Monitoring Program or from other sources
- opportunities for improving the PNF MER Framework, including changes to monitoring and evaluation priorities and data collection.

The Steering Committee, independently chaired by the Commission, has carried out the annual check of the evidence base, as required under Clause 4.3 of the PNF codes and in accordance with the endorsed approach.[49] The 2024-2025 annual check is the third annual check conducted since the PNF codes were released in May 2022. The check focused on identifying new and emerging evidence from PNF MER and other sources. The identified adaptive management actions and gaps will inform current work to develop the implementation plan.

The Commission team hosted the annual check of the evidence base in May 2025 with LLS, EPA, DCCEEW and DPI, and three of the independent experts from the Steering Committee. In total, 49 sources of evidence were identified, including 25 PNF specific sources (the remainder provide broad forest contextual information). A summary of the evidence and actions arising from the annual check of the evidence base is presented in **Table 6**.

All new sources of evidence identified through the annual check are added to the stocktake of the evidence base to ensure it is up to date. This stocktake collates the identified evidence from the late 1990s to the present.

Table 6: Summary of annual check actions

Evidence sources	Adaptive management – actions arising
PNF Plan and Forest Management Plan areas and number approved Summary of landholder self-reported harvest areas and volumes	NRC to report data and emerging trends in PNF MER Annual Progress Report LLS to provide further information on the extent and proximity of FMP approvals and harvesting in areas previously affected by severe and extensive fires
Compliance activities undertaken by the EPA Land and Environment Court decision on PNF prosecution[50]	LLS and EPA to identify opportunities for advice and support services provided by LLS to support PNF Plan holders to better understand their obligations or to flag matters relating to conditions for consideration as part of the formal five-yearly assessment process LLS and EPA to consider the underlying reasons for non-compliance levels NRC to report data in the PNF MER Annual Progress Report

[49] NRC (2023) *Private Native Forestry Monitoring, Evaluation and Reporting – Approach for the annual check of evidence*. Prepared on behalf of the NSW Forest Monitoring Steering Committee.

[50] Environment Protection Authority v Whites Timber Products Pty Ltd; Environment Protection Authority v White's Haulage Pty Ltd [2024] NSWLEC 135.

Evidence sources	Adaptive management – actions arising
LLS research reports and progress updates, including complementary projects	NRC report preliminary results and progress in the PNF MER Annual Progress Report
Protocol for verifying high koala habitat suitability[51]	NRC to note completion and publication of protocol in the PNF MER Annual Progress Report
Strategic yield assessments for river red gum and cypress and western hardwoods	LLS consider further work to include the impact of climate change in assessments NRC to note key findings in PNF MER Annual Progress Report and consider in the formal five-year assessment
Remote sensing of NSW private native forests - application of potential indicators[52]	LLS to consider this report in developing the PNF MER implementation plan NRC to note completion of study in PNF MER Annual Progress Report
Evaluating the existing PNF koala prescription map[53]	DCCEEW to consider the evaluation when updating the koala habitat suitability model and the PNF koala prescription maps NRC to note completion of evaluation in PNF MER Annual Progress Report and consider in the formal five-year assessment
ABARES Forest inventory private native forestry sector report[54]	NRC to note key insights in PNF MER Annual Progress Report
DCCEEW NSW Final determinations[55]	LLS to consider in guidelines being prepared for voluntary adoption by landholders of species-specific protections for newly listed or uplisted species not currently in the PNF codes NRC to consider in the formal five-year assessment

Table continued next page

51 LLS (2025) Protocol for verifying high Koala habitat suitability.
52 Hislop S and Stone C (2024) Remote sensing of NSW private native forests - application of potential indicators. Report prepared for the NRC.
53 Elith J (2024) Evaluating the existing PNF koala prescription map. Report prepared for the NRC.
54 Howell C, Lehmann C, Daian M, Wood P and Read S (2025) Forest inventory for private native forestry, farm forestry and Indigenous forestry: Private native forestry sector report. ABARES Research Report.
55 NSW Threatened Species Scientific Committee (2025) Final determinations.

Evidence sources	Adaptive management – actions arising
Additional contextual material: Review of forest recovery in Coastal IFOA region following 2019-20 wildfires[56] Monitoring forestry outcomes using airborne LiDAR - Stage 2 Report[57] DCCEEW biodiversity outlook report 2024 dashboard, supplementary report cards and data packages[58,59,60,61] Australia's State of the Forests Report 2023 (updated indicators)[62] Recognising the Carbon Sequestration Potential in Native Regrowth Forests[63] Journal publications – 15 papers identified (Appendix 1)	LLS to consider landscape scale contextual information in the PNF MER implementation plan and when analysing monitoring data NRC to consider contextual information in the PNF MER Annual Progress Report and the formal five-year assessment

56 Western Sydney University (2024) Review of forest recovery in CIFOA region following 2019-20 wildfires. Report prepared for the NRC.
57 University of Newcastle (2024) Monitoring forestry outcomes using airborne LiDAR - Stage 2 Report. Report prepared for the NRC.
58 DCCEEW NSW (2025) NSW Biodiversity Indicator Program - Habitat Condition Dashboard.
59 DCCEEW NSW (2025) Habitat condition: report card supplementing the NSW biodiversity outlook report 2024.
60 DCCEEW NSW (2025) Persistence of ecosystems: report card supplementing the NSW biodiversity outlook report 2024.
61 DCCEEW NSW (2025) Habitat condition 2024 data package – SEED.
62 ABARES (2023) Australia's State of the Forests Report.
63 University of Queensland (2024) Recognising the Carbon Sequestration Potential in Native Regrowth Forests. Report prepared for the North East NSW, South East NSW, South & Central QLD and North QLD Regional Forestry Hubs.

5 Priority next steps

5.1 MER implementation

LLS is responsible for finalising the implementation plan following the conclusion of the remote sensing feasibility study. When biophysical indicators have been agreed through the plan, LLS will commence data collection subject to available funds.

LLS will commence other new MER activities outlined in the implementation plan, with oversight from the Steering Committee, as well as continue research and investigations already underway (for example, fauna monitoring under the Countryside Critters program).

The Steering Committee, independently chaired by the Commission, will continue its oversight responsibilities including to conduct the next annual check of the evidence base for the 2025-26 year.

5.2 Finalise koala habitat modelling and prepare a revised draft PNF koala prescription map

The Commission will continue to work closely with independent experts and DCCEEW scientists and modellers to progress updates to finalise the koala habitat suitability model. Following completion of the modelling, DCCEEW will prepare a draft updated PNF koala prescription map, and the technical review team and experts will consider implications. The Steering Committee will then consider findings, and if warranted, propose map updates to the relevant Ministers.

Updates to the PNF koala prescription map must be overseen by the Forest Monitoring Steering Committee and require the joint approval of the Minister administering the *Local Land Services Act 2013* and the Minister administering the *Biodiversity Conservation Act 2016*.

5.3 Assessment to inform if further mitigations are warranted

The Commission team with input from the technical review team and advice from independent experts will consider whether further mitigation options or complementary measures are needed for at risk species.

The Steering Committee will then consider the findings and recommendations. These could include proposing amendments to protections for species in the PNF codes if material risks have been identified.

Appendix 1: Papers identified in 2024-25 annual check of evidence

Al-Chokhachy R, Poole G, Thomas C, Saunders C, Roper B, Hendrickson S, Davis C, Crapster K and Archer E (2025) 'The Effects of Unpaved Roads on Instream Sediment: Patterns and Challenges for Monitoring', *JAWRA Journal of the American Water Resources Association*, 61(2), e70006.

Beranek C T, Southwell D, Jessop T S, Hope B, Gama V F, Gallahar N, Webb E, Law B, McIlwee A, Wood J, Roff A, and Gillespie G (2024) 'Comparing the cost-effectiveness of drones, camera trapping and passive acoustic recorders in detecting changes in koala occupancy', *Ecology and Evolution*, 14, e11659.

Chung Y F, Maron M, Drielsma M and Rhodes J (2025) 'Do private land conservation policies and programs adequately consider climate change?', *Biological Conservation*, 308, 111187.

Driscoll D A, Macdonald K J, Gibson R K et al. (2024) 'Biodiversity impacts of the 2019–2020 Australian megafires', *Nature*, 635, 898–905.

Francis B, Venn T and Lewis T (2023) 'Timber Production Opportunities from Private Native Forests in Southern Queensland', *Small-scale Forestry*, 23, 1-24.

Gibbons P, Stojanovic D, Lindenmayer D B, and Owens G (2024) 'Impacts of changing fire regimes on hollow-bearing trees in south-eastern Australia', *International Journal of Wildland Fire*, 33, WF23094.

Gorrod E, White L, Slavich E, Woodward R, McAllister D, Travers S K, Spooner P and Lawrie K (2025) 'Restoration thinning promotes resprouting and recruitment in an Australian floodplain forest', *Restoration Ecology,* e70056.

Hou Y and Wei X (2024) 'Forest disturbance thresholds and cumulative hydrological impacts', *Water Resources Research*, 60(5), e2024WR037339.

Noske, P.J., Nyman, P., Lane, P.N., Rengers, F.K. and Sheridan, G.J., 2024. Changes in soil erosion caused by wildfire: A conceptual biogeographic model. Geomorphology, 459, 109272.

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Suitor S, Hadley D and Ximenes F (2025) 'Options for Forest Sector Participation in International Carbon Markets: Unlocking the Carbon Market Potential of Australia's Forest Sector', *Land*, 14(3), 473.

Ward M, Ashman K, Lindenmayer D B, Legge S, Kindler G, Cadman T, Fletcher R, Whiterod N, Lintermans M, Zylstra P, Stewart R, Thomas H, Blanch S and Watson J E M (2024) 'Shifting baselines clarify the impact of contemporary logging on forest-dependent threatened species', *Conservation Science and Practice*, 6(9), e13185.

Ward M, Maron M, Simmonds J S, Lintermans M, Whiterod N S, Chapple D G, Possingham H P, Legge S M, Gallagher R V, Wintle B A, Vine S, Ashman K, Hoskin C J, Garnett S T, Woinarski J C Z, Scheele B C, Loane C, Fitzsimons J A, Stewart R R, Tulloch A I T, Hyman I T,

Pearce K, Burbidge A H, Raadik T A, Kuchling G, Georges A, West M, Adams V M, Emery J P, and Watson J E M (2025) 'Half of the habitat of Australia's highly imperilled narrow-range species is outside protected areas', *Biological Conservation*, 111195.

Wardell-Johnson G W and Robinson T P (2025) 'Hostile environments, terminal habitat, and tomb trees: the impact of systemic failures to survey for mature-forest dependent species in the State forests of New South Wales', *Pacific Conservation Biology*, 31, PC24014.

Yu Z, Zhao Q, Liu Y, Yu J, Wang A and Ding S (2024) 'Soil erosion associated with roads — A global review and statistical analysis', *Land Degradation & Development*, 35(11), 3509-3522.