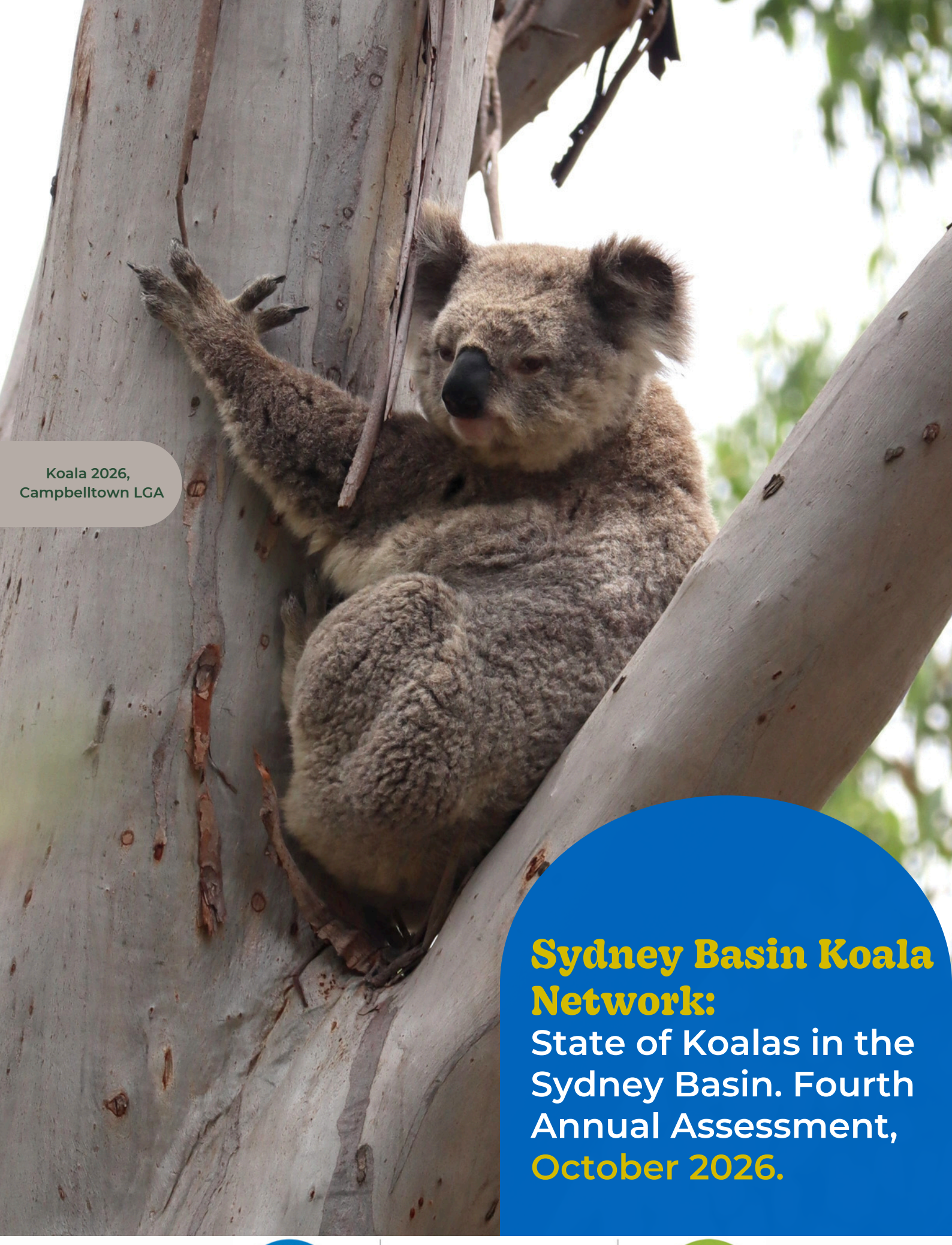


Koala 2026,
Campbelltown LGA

Sydney Basin Koala Network:

State of Koalas in the Sydney Basin. Fourth Annual Assessment, October 2026.

SYDNEY BASIN koala network

TOTAL ENVIRONMENT CENTRE

WIRES

Sydney Basin Koala Network: Protecting Koalas in the Sydney Basin

Acknowledgements:

The Sydney Basin Koala Network (SBKN) has been established by Total Environment Centre (TEC), partnering with funding from WIRES, to:

- Increase public knowledge and appreciation of the region's koala populations
- Inform local, state and federal governments about the existence, conservation status and threats to koala populations and effective measures to protect them
- Provide local communities with community briefings and citizen science training
- Work with NGO's, scientists, and conservation agencies to achieve these aims.

Report Authors

- SBKN: Stephanie Carrick & Jade Peace
- TEC: Jeff Angel
- Biolink: Amanda Lane

SBKN Network Partners

- Nature Conservation Council of NSW
- Australian Climate and Forest Alliance
- Humane Society International Australia
- Australian Wildlife Society
- International Fund for Animal Welfare Australia
- Hawkesbury Environment Network
- Hunter Community Environment Centre
- Lithgow Environment Group
- Blue Mountains Conservation Society
- Sutherland Shire Environment Centre
- Save Manly Dam Catchment Committee
- Hills-Hornsby Rural Koala Project
- Save Sydney's Koalas
- Oatley Flora and Fauna Conservation Society
- Valley for Wildlife, MacDonald Valley Association
- DoSomething Foundation
- Lane Cove Bushland and Conservation Society
- WinZero (Wingecarribee Net Zero Emissions)
- Koala Koalition Econetwork Port Stephens
- Wilton Action Group
- Help Save Appin and Surrounds

Photo Credits

- Cover - Stephanie Carrick - Koala Noorumba Reserve, Campbelltown
- Back Stephanie Clay -Koala Kurrajong Hills, Hawkesbury

Sydney Basin Koala Network:
State of Koalas in the Sydney Basin: Fourth Annual Assessment. August 2026.

Table of Contents:

03 Exectutive Summary

04 Local Council Koala Conservation Progress

05 State Policy Advocacy and Planning Reform

06 State Planning - South West Sydney Chlamydia

07 State Planning - NSW Baseline Survey

08 State Planning - Crowther CPCP Report

09 State Planning - 2025 Sydney Vehicle Strike Analysis

11 SBKN Report Card

12 SBKN Koala Protection Policy Recommendations

13 **Biolink Ecological Consultants' Report for the Sydney Basin Koala Network:** Koala Habitat, Connectivity and Clearing Risk Across the Sydney Basin Bioregion

10: Part One – Identifying Koala Habitat at Risk of Clearing

63: Part Two – Evaluating Conservation Accountability and Planning Outcomes

67: Part Three – Data Limitations and Barriers to Accountability .

70: References

Sydney Basin Koala Network: Protecting Connected Landscapes for Koalas

Executive Summary

This year, SBKN has focused on one of the most important, and often overlooked, aspects of koala conservation: **protecting the corridors that connect koala populations and allow them to move between areas of habitat.**

The release of SBKN's Greater Sydney Koala Corridor Mapping report and interactive map has provided a clear, evidence-based picture of where these connections are most important and where they are at risk. The mapping demonstrates the need to protect the network of corridors that enables koalas to move, disperse and access food and breeding habitat across the Sydney Basin.

This evidence has directly informed SBKN's advocacy on major development and planning decisions. In Wollondilly, SBKN advocated for the protection of the important Nepean West koala corridor in the face of proposed industrial development. In Campbelltown, sustained advocacy helped secure recognition of the Menangle Creek corridor, including resolving a developer deadlock for the koala underpass, and contributed to proposed changes to the Campbelltown LEP. At Kurrajong Heights, SBKN supported efforts to maintain an important wildlife corridor connecting habitat across the landscape.

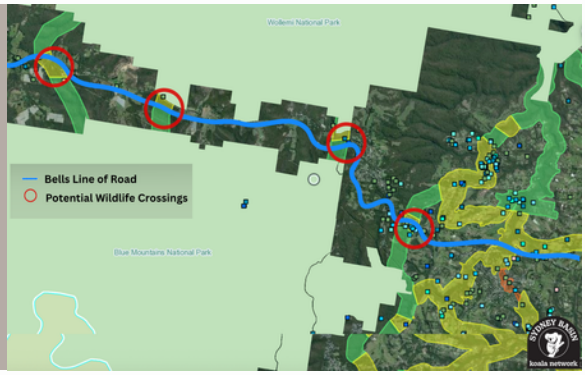
Our 2026 Biolink report identified 65,124 hectares of koala habitat in the Sydney Basin at elevated risk of clearing, modification or fragmentation, providing an invaluable evidence base for SBKN's advocacy to protect critical habitat and corridors and hold the government accountable for its koala conservation commitments.

Our work has also highlighted the growing threat posed by roads. SBKN's analysis of koala vehicle strikes has demonstrated how new and upgraded roads are creating emerging barriers through koala habitat. Together, these actions represent a shift from protecting the landscape-scale network that koalas need to survive. SBKN has brought scientific evidence, community advocacy and planning expertise together to influence decisions affecting some of the Sydney Basin's most important remaining koala habitat.

Because of SBKN's important work, corridors have gained greater recognition in planning processes, wildlife crossings are receiving increased attention, habitat protection has been strengthened in key locations, and koala connectivity is increasingly being recognised as an essential consideration in the future planning of Greater Sydney.

Case Study - corridors and crossings

SBKN's corridor mapping not only identifies priority koala corridors, but also highlights where these corridors intersect with roads, helping identify priority locations for wildlife crossings and targeted action to maintain connectivity across increasingly fragmented landscapes, such as our submission for safety improvements on Bells Line of Road in the Hawkesbury.



Local Council Koala Conservation Progress

Local councils remain critical partners in koala conservation and we are very pleased in the progress made by many individual councils which are home to significant koala populations in the Sydney Basin after our continued advocacy. SBKN has supported councils and communities working to strengthen local protections, including direct engagement with Local Councillors, formal submissions and presentations at Local Planning Panels. Key outcomes include:

- **Sutherland Shire Council** made major progress this year, developing and adopting its first Koala Management Plan in June 2026. The plan is based on habitat mapping, connectivity modelling and threat assessment and establishes actions to protect and reconnect habitat, and reduce threats. Despite this work, Sutherland Shire is still not listed in the State based Koala SEPP, meaning there is no legislative weight behind the plan. We continue to advocate for this critical issue to be resolved by the NSW Government.
- **Hawkesbury City Council** has been progressing its promised Koala Plan of Management through detailed ecological work, including fine-scale vegetation mapping, identification of priority koala food trees and development of highly suitable habitat mapping. After advocating on the issue, we were also please that council has formally requested to opt out of the damaging Rural Boundary Clearing Code, recognising the importance of protecting koala habitat from fragmentation.
- **Wingecarribee Shire Council** made significant progress on koala conservation in 2026, commencing preparation of a Shire-wide Comprehensive Koala Plan of Management, completing new Core and Highly Suitable Koala Habitat mapping, and progressing a koala habitat corridor map to identify priority landscape linkages.
- **Wollondilly Council** has been progressing work towards a koala management plan, including koala monitoring and restoration of habitat. Crucially, via the dvelopment assessment process, Wollondilly Council has strengthened protection of the Nepean West primary koala corridor,consistent with the NSW Chief Scientist's recommended width, helping maintain a functional landscape-scale connection for koala movement.
- **Campbelltown Council** has strengthened the statutory recognition of its Comprehensive Koala Plan of Management (CKPoM) through recent LEP amendments helping ensure that the protection of koala habitat and connectivity is embedded in local planning decisions.
- **Lake Macquarie City Council** has continued to strengthen its evidence base for koala conservation this year through ongoing koala surveys and habitat mapping, improving understanding of koala distribution and habitat. An unexpectedly high occupancy of an estimated 2000 koalas living in and around Mt. Sugarloaf reserve should inform progress towards a plan of management that we will continue to advocate for.
- **Cessnock City Council** progressed its Koala Habitat Study in partnership with the NSW Koala Strategy. The study is mapping koala habitat and undertaking targeted surveys across key areas including Mulbring, Ellalong and the western Watagan slopes, providing critical evidence to guide future conservation and land-use planning.

Despite supporting important areas of koala occupancy, councils including **Liverpool, The Hills Shire, Hornsby and Wollongong** are falling behind leading Sydney Basin councils in translating the presence of koalas into dedicated, landscape-scale protection of habitat and corridors; **in Liverpool, this is particularly concerning, with the 2026 Biolink assessment identifying more than 50% of koala habitat as being at risk.**

State Policy Advocacy and Planning Reform

There has been some important progress for Sydney Basin koalas, particularly investment in wildlife crossings, protection of the Georges River Koala Reserve and stronger recognition of corridor connectivity via gateway determinations. **However, these practical gains have not been matched by fundamental reform of the planning framework. The CPCP continues to facilitate habitat clearing and fragmentation - including threats to critical corridors such as Mallaty Creek - while the NSW Koala Strategy remains under review and the underlying planning protections remain inadequate.**

Since SBKN's 2025 Progress Report, the NSW Government has made limited progress against its koala policy reform priorities, particularly via biodiversity-offset reform and habitat mapping. However, most of SBKN's core reform priorities remain outstanding: recognised koala corridors still lack comprehensive legal protection, key Sydney Basin LGAs remain unprotected via the Koala SEPP, ARKS have no regulatory protection, code-based agricultural clearing continues, and the CPCP continues to facilitate habitat loss and fragmentation while proposing highly damaging development modifications within mapped koala corridors.

- Koala SEPP Guideline: The guideline has not been finalised to provide a comprehensive list of koala habitat trees applying across both rural and urban land.
- Legal protection for koala corridors: Recognised koala corridors have not been comprehensively given statutory protection or secured as appropriately sized C2 conservation land, consistent with the Chief Scientist's recommendations.
- Expansion of the Koala SEPP: Sutherland Shire, Penrith and The Hills Shire remain outside the Koala SEPP despite documented koala occupancy.
- Cumberland Plain Conservation Plan reform: The CPCP has not been fundamentally reformed to prevent ongoing koala habitat loss and fragmentation. Proposed modifications remain a significant threat to habitat and connectivity, including Mallaty Creek.
- Rural Boundary Clearing Code: The RBCC has not been scrapped across the Sydney Basin Bioregion. While Hawkesbury Council has voted to opt out, the underlying State framework remains.
- Protection of Areas of Regional Koala Significance (ARKS): No interim regulatory controls have been introduced to prevent clearing of koala habitat within ARKS on public or private land.
- Universal council Koala Plans of Management: NSW has not funded and delivered a program ensuring that all Sydney Basin councils have a Comprehensive Koala Plan of Management (CKPoM).
- Local Land Services Act reform: While a new vegetation map has been recently released, code-based clearing under the LLS Act continues, with no fundamental legislative reform to ensure koala habitat receives the stronger protection advocated by SBKN

Protecting koalas requires not only investment in crossings, restoration and monitoring, but stopping the unnecessary destruction and fragmentation of the habitat those measures are intended to protect. Koalas must be able to move safely through the landscape, beyond national parks, to enable gene flow and population recovery.

Attempts to protect South-West Sydney's unique koala population from chlamydia while habitat loss and associated stressors continue

Following the detection of chlamydia in two rescued koalas from Appin in 2024, NSW DCCEEW responded with increased surveillance, testing and biosecurity measures and commissioned a dedicated Chlamydia Management Strategy for southern Sydney, recognising the need to protect this historically disease-free population.

NSW DCCEEW is also investing in a Chlamydia Management Strategy for the region, developed by the University of Sydney, with more than 60 government and community stakeholders, including SBKN, participating in the 2025 strategy workshop. A vaccination trial involving 53 koalas produced an immune response, but four fully vaccinated koalas contracted chlamydia within six months, demonstrating that vaccination alone cannot provide sufficient protection for a wild population.

The disease threat makes protecting the population's remaining connected habitat even more important. NSW Government information identifies habitat loss and fragmentation as pressures facing South-West Sydney koalas, alongside vehicle strike and disease. Habitat loss, fragmentation and vehicle strike are known to exacerbate the risk of disease in koala populations (Narayan 2019, McCallum et al 2017, Blyton et al 2025). It is therefore deeply concerning that while NSW DCCEEW is investing in disease surveillance, vaccination research and koala health, NSW Planning and the CPCP continue to facilitate clearing and fragmentation of the habitat that supports this vulnerable population. **The priority must be to protect the connected landscape that gives these koalas the best chance of remaining healthy and resilient, not continue removing it.**

The situation in South-West Sydney presents a striking contradiction in NSW koala policy. This is particularly concerning in Campbelltown LGA, where the 116-hectare Mallaty Creek corridor in the chlamydia free zone will be cut-off despite extensive advocacy to retain it as functioning habitat, and urban sprawl continues at pace on the fringes of the Georges River National Park in St Helens and Airds.

The investment in the health and resilience of this population is undermined when the planning system simultaneously permits senseless clearing that destroys their habitat, disrupts connectivity within the chlamydia free zone and adds further stress to an already vulnerable population.

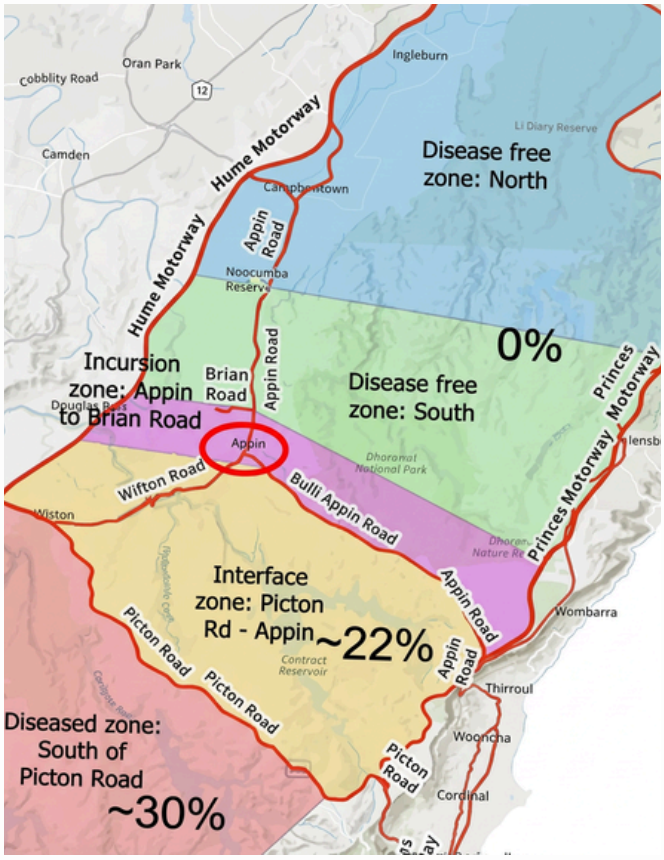


Figure 1: Slide form Univesity of Sydney's Koala Health Hub presentation at a community forum in Campbelltown in August 2026 outlining the prevelance of Chlamydia in South-West Sydney and areas of active management in interface and incursion zones.

The NSW Baseline Koala Survey and fragmentation in the Sydney Basin

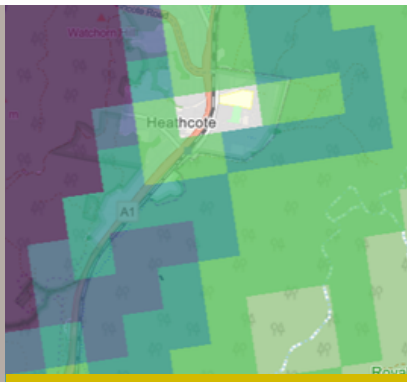
The NSW Koala Baseline Survey represents a substantial public investment (over $20 million) and has produced markedly higher estimates of koala occupancy and population size than previously reported. These findings have been interpreted in some contexts as indicating a more favourable conservation status than previously understood. However, this is at odds with the 2022 uplisting of the koala to Endangered under the *EPBC Act*, which reflects ongoing declines, fragmentation and threats across much of the species' range. It is widely acknowledged that improved detection methods can increase estimated population size without reflecting a true increase in abundance and therefore the spatial outputs of the survey warrant some scrutiny.

The modelling approach appears to be limited by the treatment of habitat suitability without explicit incorporation of landscape connectivity or barriers to movement. While a broad range of environmental covariates were considered (*e.g.* vegetation indices, climate, soils and fire), there is no clear evidence that functional constraints such as urbanisation, major transport corridors or landscape fragmentation were incorporated as limiting factors in the occupancy or abundance models. As a result, the modelling framework may conflate structurally suitable habitat with functionally available habitat. In fragmented landscapes, koala absence is often driven not by vegetation characteristics but by isolation, mortality pressures and the inability of individuals to disperse between habitat patches. If these processes are not explicitly represented, the model is likely to over-predict occupancy in such areas.

In the case of the NSW Baseline Koala Survey, this issue may have been compounded by survey design which limited sampling in heavily urbanised or infrastructure-dominated landscapes. The outcomes may therefore under-represent areas that appear suitable but are unoccupied due to fragmentation, reducing the model's ability to learn from true absences. The modelling predictions tend to smooth occupancy across environmentally similar areas, rather than reflecting the discontinuous and fragmented nature of real koala populations.

Case Study - Royal National Park Occupancy anomaly

Royal National Park provides a useful case study. The modelling indicates moderate to relatively high occupancy within the park, however, this is difficult to reconcile with the known ecological context. The park is dominated by low-nutrient sandstone landscapes that typically support low-density koala populations. It is also effectively isolated by surrounding urban development and major transport infrastructure, limiting connectivity with other populations. While the environmental metrics used in modelling may indicate broadly suitable habitat, these areas may be functionally constrained, with low carrying capacity and limited population persistence. In this context, predicted occupancy might be plausibly interpreted as an artefact of the modelling framework rather than an accurate reflection of population status.



Baseline survey modelling showing a medium-high occupancy in areas of the RNP despite no presence detected

Taken together, these issues suggest that **while the NSW Baseline Koala Survey provides valuable broad-scale information, its outputs should be interpreted with caution at the landscape scale relevant to planning and conservation decision-making.** In particular, there is a risk that occupancy and abundance are overestimated in fragmented or marginal environments where connectivity constraints and local population dynamics are not adequately captured. This has important implications for policy and advocacy, as **it may obscure areas of genuine risk and understate the vulnerability of koala populations, particularly in peri-urban landscapes.**

(Amanda Lane, Biolink Ecological Consulting)

Cumberland Plain Conservation Plan inconsintent with National Koala Recovery Plan.

An expert report by University of Sydney ecologist Professor Mathew Crowther, prepared for our network partner Save Sydney's Koalas, found that the Cumberland Plain Conservation Plan (CPCP) is likely to significantly impact Habitat Critical to the Survival of the Koala (HCSK), particularly east–west corridors essential for koala movement, dispersal, gene flow and metapopulation processes in the Campbelltown population.

Professor Mathew Crowther's findings are particularly significant given his previous role on the NSW Chief Scientist & Engineer's Independent Expert Panel established to assess the adequacy of koala protection measures within the CPCP's Wilton and Greater Macarthur Growth Areas.

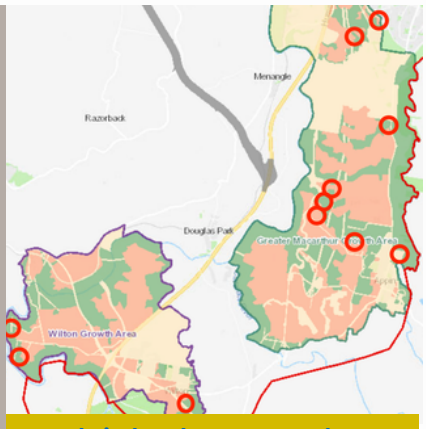
The report identified more than 1,100 hectares of koala habitat approved for clearing, including critical habitat and important movement corridors, and found significant deviations between the CPCP assessment and the National Koala Recovery Plan, including reliance on habitat suitability rather than HCSK criteria, incomplete koala records and the use of offsets to justify habitat loss despite offsets being excluded from the Recovery Plan's habitat-gain objectives. It also highlights that corridor severance from roads and housing, delayed revegetation, uncertain crossing effectiveness, inadequate fencing and the population's low genetic diversity mean mitigation and offsets cannot adequately compensate for the immediate and potentially irreversible loss of functional habitat and connectivity.

To address these failures, the CPCP should be strengthened through an independent reassessment of Habitat Critical to the Survival of the Koala, legal protection of functional east–west corridors, minimum corridor-width standards consistent with Chief Scientist advice, and mandatory delivery of wildlife crossings and associated fencing before development impacts occur.

The 2027 five-year review provides a critical opportunity to incorporate updated koala data, address deficiencies in the original assessment and ensure that habitat loss and corridor fragmentation are avoided rather than retrospectively compensated through offsets.

Case Study - damaging CPCP modifications

The Sydney Basin Koala Network strongly objects to the proposed Cumberland Plain Conservation Plan (CPCP) modifications, as they underestimate cumulative impacts and allow further fragmentation and loss of koala habitat and critically endangered ecological communities through inappropriate "avoided land" and offsetting arrangements. The NSW Government is allowing CPCP modifications through its established amendment process, but repeated site-by-site changes are progressively weakening the biodiversity principals of the plan by increasing development opportunities, reducing koala habitat and corridor protection, and undermining its original landscape-scale conservation objectives.



Red circles show encroachments on Koala corridors as part of CPCP modifications

Koala Road Strike in South-West Sydney in 2025: A shifting issue

Protecting koalas requires connected habitat and safe movement across the landscape. Our analysis of koala vehicle strikes across South-West Sydney, highlights a concerning shift in where koalas are being killed on more roads and new hotspots on both Appin and Heathcote Roads as habitat used by koalas becomes cut off by exclusion fencing.

There was a welcome reduction in koala deaths on Appin Road following the installation of exclusion fencing. However, this improvement is masking a broader problem: koala vehicle strikes are increasing on other roads across Campbelltown, Liverpool, Sutherland and Wollondilly. In 2025, 46 koalas were recorded as struck by vehicles across South-West Sydney, with approximately 80% of these deaths being fatal. This is likely to be an underestimate, as previous research has found that a substantial proportion of koala vehicle strikes go unreported (Phillips and Fitzgerald, 2014).

.

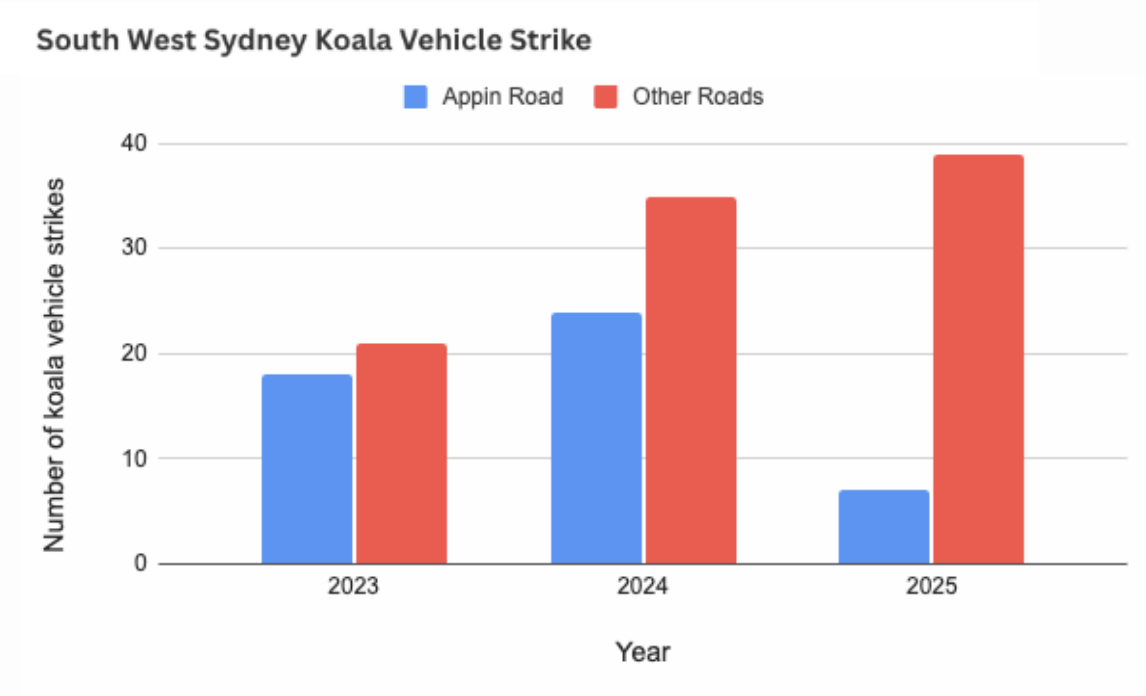


Figure 1: As Appin Road becomes fenced off, vehicle strikes are rising on other roads

More Koalas killed on more roads

Most significantly, koalas were recorded being struck on 10 additional roads in 2025 where no strikes had previously been recorded, with the vast majority in Campbelltown LGA, where Appin Road was fenced. This expansion across the road network makes effective mitigation more difficult, particularly where responsibility is divided between Transport for NSW and local councils. While there is not research to prove a direct connection between fencing on Appin Road and increase in vehicle strike on other roads, there is a correlation. Fencing has been fast-tracked while functional underpasses remain years away. Protecting koalas requires safe movement, not simply preventing road access.

Number of roads where koalas are being struck by vehicles in the past 3 years

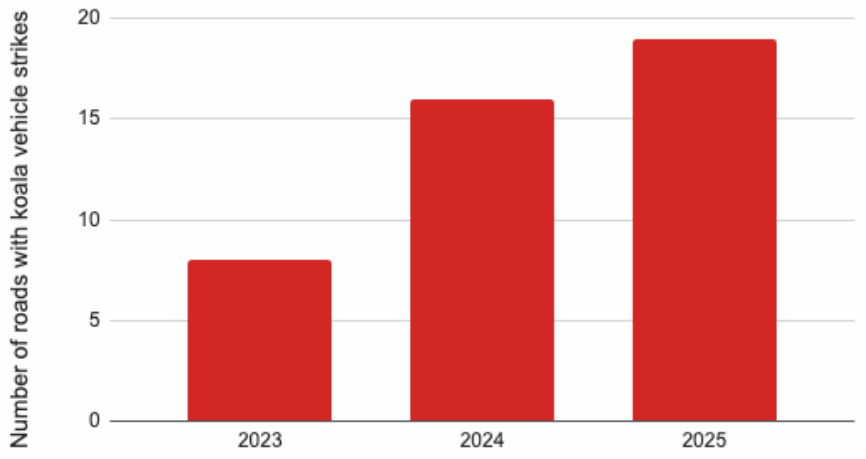


Figure 2: The number of roads where koalas are being struck is also rising from 2023-2025

Vehicle strike hotspots on Appin Road remain - at Mallaty Creek

Where there is no fencing, Koalas are still attempting to cross Appin Road with a number of deaths and rescues occurring at recognised Koala corridor Mallaty Creek - this is the Koala corridor where no crossing will be provided, rather all 116 hectares of the most direct, unimpeded route of remnant Koala Habitat between the Nepean and the Georges River will be cut off and lost to Koalas. We are calling on the NSW Government to reverse this terrible decision that sacrificed Mallaty Creek to developers, and add a wildlife crossing to allow Koalas to maintain their natural inclination to travel East-West.

It is not appropriate to fence off access to important Koala biobanks and hundreds of hectares of Koala habitat in migratory corridors and claim success of vehicle strike reduction on Appin Road while Koalas are diverted to a similar fate on other roads. We are calling on the government to seek updated advice on all South West Sydney Koala Corridors in the face of these significant impacts from the NSW Chief Scientist



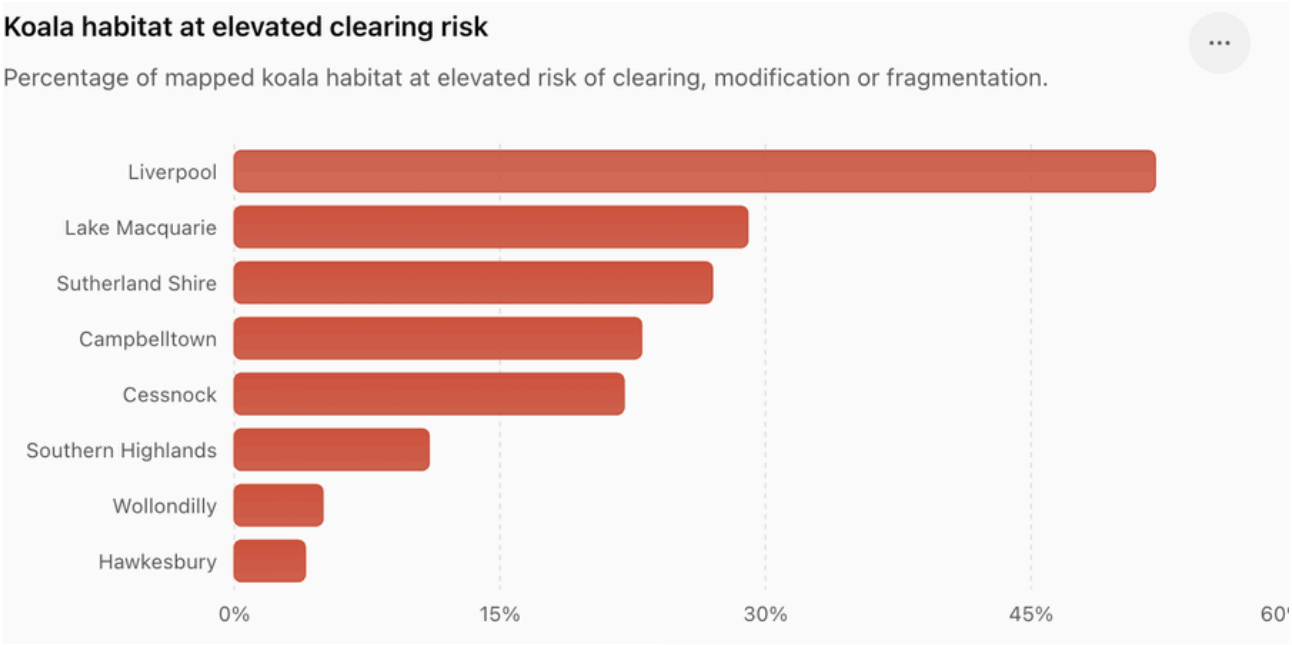
Heathcote Road upgrade at Holsworthy made culverts inhospitable to Koalas

Case Study - Holsworthy Hotspot, Liverpool LGA

The Heathcote Road upgrade at Holsworthy appears to have significantly altered an established koala movement area around Harris Creek and Williams Creek.
Local residents report that koalas previously moved along the creek corridors and surrounding habitat, but extensive construction fencing restricted wildlife movement for several years. Changes to the creek crossings, including increased concrete areas, may also have reduced their suitability as natural movement routes.
After no vehicle strikes reported in the area, there have been seven koala vehicle strikes in the past two years, highlighting the ongoing risk at this hotspot. A recent report of a koala trapped by a barrier further demonstrates the need for urgent investigation and mitigation to restore safe, functional movement routes for koalas.

SYDNEY BASIN KOALA HABITAT AT RISK

65,124 hectares of koala habitat across 8 focal-area councils



KOALA PROTECTION POLICY PROGRESS

Ensure legal protections apply to all koala habitat by implementing consistent, comprehensive mapping across NSW as a matter of urgency.
The new vegetation map applies exclusively to rural land in Campbelltown LGA, leaving all other koala habitats across the Sydney Basin completely unprotected.

Maximise protection of koala habitat by mandating appropriate and consistent levels of regulation.

Bolster safeguards in assessment and determination processes.

Prohibit logging in koala habitat.
While some areas in NSW have been protected, logging is still permitted in koala habitat in the Sydney Basin.

Improve accountability and enforcement of laws.
We are not aware of any recent changes to requirements to improve accountability and enforcement of laws.

Optimise the use of conservation and strategic planning tools.
As part of ongoing work on koala conservation the NSW Government should increase its ambition for protecting koalas corridors on public and private land.

Overhaul national environmental laws.
New laws create an independent watchdog, however fail to outlaw koala habitat clearing instead developers to use environmental offsets and fast-tracked project approvals.

SBKN Koala Protection Policy Recommendations

The NSW Government has generated substantial habitat and population data over this term. The outstanding issue is that this knowledge is not consistently or adequately translating into statutory protection, decisions on development, or measurable recovery outcomes, especailly in peri-urban areas with important work undertaken by one branch of government (Environment), overridden by another (Planning). NSW koala policy should turn mapping into protection, protection into functioning habitat, and government investment into measurable population recovery by prioritising the following recommendations:

1. Protect koala corridors in law
Make koala corridors statutory planning constraints, including via the Blue-Green Grid, with enforceable minimum standards for width, continuity and ecological function.

2. Protect high-quality habitat from clearing
Strengthen avoidance requirements for Primary and Class 2A koala habitat and stop treating different habitat types as interchangeable offsets.

3. Make planning accountable for cumulative impacts
Require assessment of cumulative habitat loss, fragmentation, roads and development across koala focal areas as part of individual development assessments.

4. Replace activity reporting with ecological outcomes
The NSW Government should report whether habitat, corridors and koala populations are actually increasing—not simply how much money has been spent or how many projects have been delivered.

5. Establish a public statewide koala accountability system
Publish annual data at local, regional and state levels on habitat cleared, habitat protected/restored, corridor condition, mitigation effectiveness, mortality and population trends, using a consistent methodology

6.Translocation programs should cease
Moving koalas out of their natural home ranges causes extreme stress, high mortality rates, and severe dietary disruption. Policy must focus on safeguarding and restoring connected, natural wildlife corridors where populations can permanently thrive. habitats.

Outstanding SBKN 2025 Koala Protection Recommendations

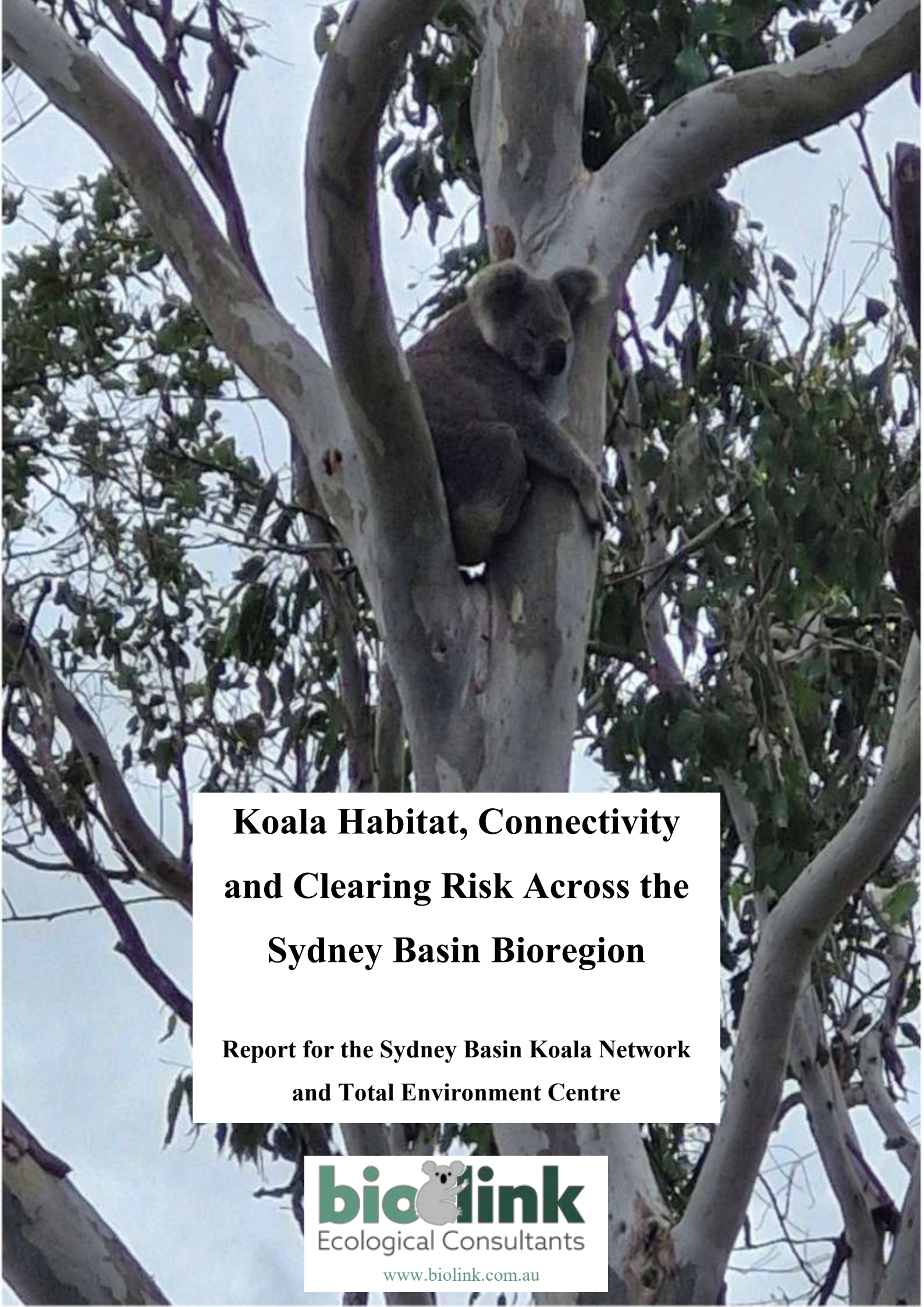
1. Reform the Biodiversity Conservation Act (BCA) to strengthen protection for koalas (and other species).

2. Protect and restore Mallaty Creek habitat corridor in Campbelltown LGA for koalas with an additional wildlife crossing on Appin Road to mitigate the unprecedented amounts of roadkill on Appin Road, and as previously advised by koala experts.

3. Apply a scientifically robust definition of koala habitat to legal frameworks and apply this to all LGAs with koala sightings so all councils can quickly proceed with habitat mapping and Comprehensive Koala Plans of Management.

4. Reform the Local Land Services Act to end code based clearing and remove the outdated 1990 regrowth rule.

5. Scrap the unscientific Rural Boundary Clearing Code in the Sydney Basin to prevent fragmentation of habitat.



Koala Habitat, Connectivity and Clearing Risk Across the Sydney Basin Bioregion

Report for the Sydney Basin Koala Network and Total Environment Centre

biolink
Ecological Consultants
www.biolink.com.au

Content

1. Executive Summary 3
2. Introduction / Background 8
3. Part One – Identifying Koala Habitat at Risk of Clearing 10
   3.1 Methods 10
      3.1.1 Study Area 10
      3.1.2 Preferred Koala Habitat (PKH) mapping 14
      3.1.3 Mapped connectivity pathways 16
      3.1.4 Identifying koala habitat at risk 17
      3.1.5 Identifying protected koala habitat 21
      3.1.6 Spatial analysis 22
   3.2 Results and Discussion 22
      3.2.1 Sydney Basin (study area) 22
      3.2.2 Campbelltown / Wollondilly Focal Area 24
      3.2.3 Liverpool Focal Area 31
      3.2.4 Sutherland Focal Area 36
      3.2.5 Wingecarribee Focal Area 41
      3.2.6 Hawkesbury Focal Area 46
      3.2.7 Cessnock / Lake Macquarie Focal Area 52
      3.2.8 Sydney Basin Koala Network – Greater Sydney Corridors 59
   3.4 Discussion 61
4. Part Two – Evaluating Conservation Accountability and Planning Outcomes 63
   4.1 Strategic conservation planning versus measurable outcomes 63
   4.2 Key accountability questions and current evidence gaps 64
5. Part Three – Data Limitations and Barriers to Accountability 67
   5.1 Current strength of available datasets 67
   5.2 Remaining limitations and barriers to accountability 67

References 70

Appendix A 73

Abbreviations

Abbreviation	Description
BC Act	*NSW Biodiversity Conservation (BC) Act 2016*
CPCP	Cumberland Plain Conservation Plan
EPBC Act	*Environment Protection and Biodiversity Conservation Act (EPBC) 1999*
IUCN	International Union for the Conservation of Nature
LEP	Local Environmental Plan
LGA	Local Government Area
NPWS	National Parks and Wildlife Service
NSW	New South Wales
PCT	Plant Community Type
PKFT	Preferred Koala Food Tree
PKH	Preferred Koala Habitat
SBKN	Sydney Basin Koala Network

Biolink Ecological Consultants

Supervising Ecologist: Amanda Lane

Ecologist: Eyleen Pinna

Spatial Analyst: Ivan Storr

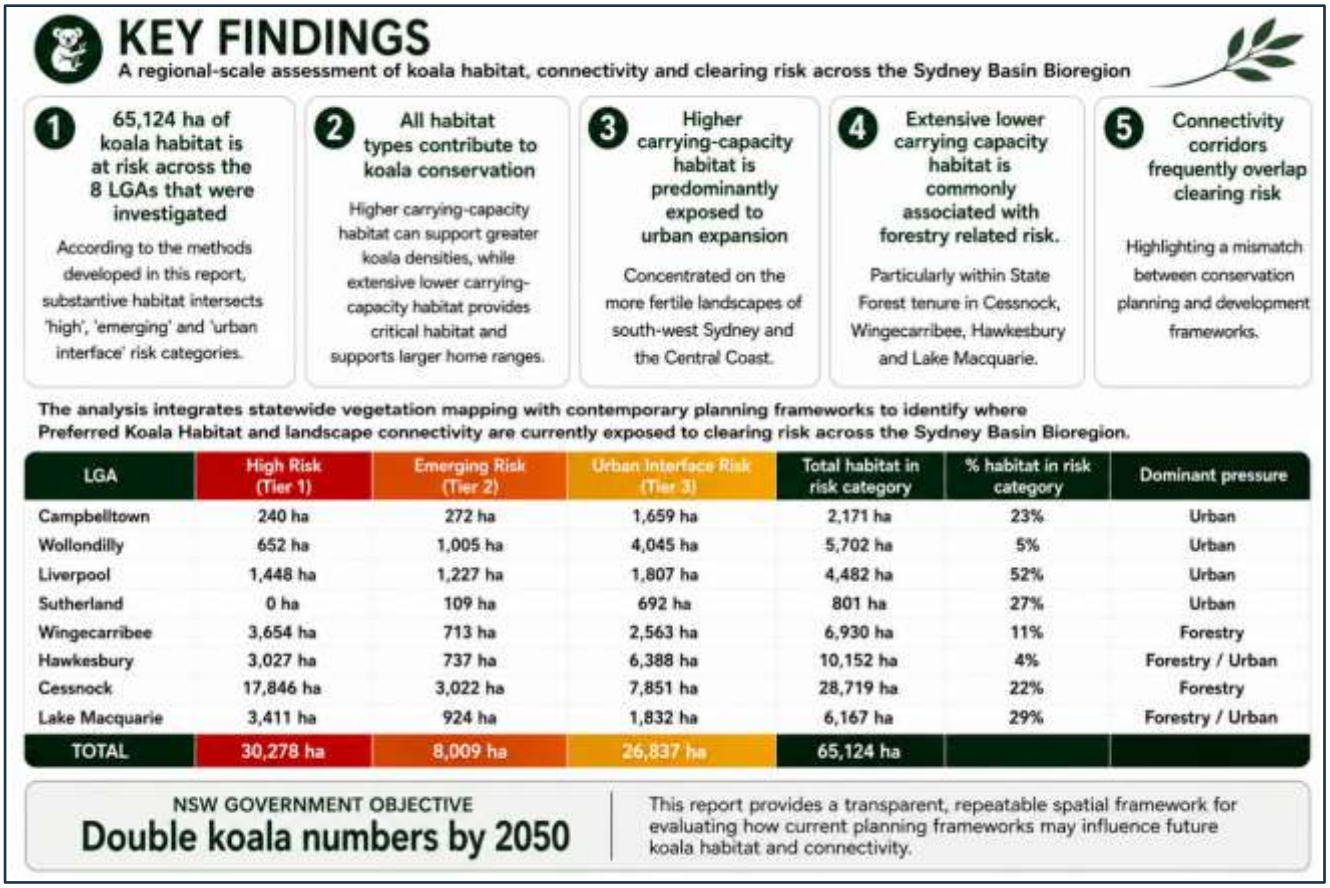
Acknowledgement of Country

Biolink Ecological Consultants acknowledges the Traditional Owners of the lands across which this study applies. We recognise that these lands are part of a broader cultural landscape that has been cared for by Aboriginal people for thousands of years. We pay our respects to Elders past and present, and acknowledge the ongoing connection of Aboriginal people to Country, including its lands, waters, plants and animals. We recognise the cultural significance of koalas within Aboriginal knowledge systems and respect the role of Traditional Owners in caring for Country.

How to cite this Status Report

Biolink Ecological Consultants (BEC) (2026). Koala Habitat, Connectivity and Clearing Risk Across the Sydney Basin Bioregion. Report to Sydney Koala Network and Total Environment Centre by Biolink Ecological Consultants, NSW.

1. Executive Summary



Koalas within the Sydney Basin Bioregion persist within a rapidly changing landscape. While substantial areas of koala habitat remain across the region, many populations occur within landscapes undergoing ongoing urban expansion, infrastructure development, forestry operations and associated land use change. At the same time, strategic conservation planning has increasingly recognised the importance of maintaining habitat connectivity to support koala movement, dispersal and long-term population persistence.

This project, undertaken for the Sydney Basin Koala Network (SBKN) and Total Environment Centre (TEC), examined the relationship between koala habitat, mapped connectivity pathways, protected lands and clearing risk across six focal areas comprising eight Local Government Areas (LGAs) within the Sydney Basin Bioregion. These Focal Areas were originally identified through the spatial co-occurrence of Preferred Koala Habitat (PKH) and evidence of generational persistence of koala populations and therefore represent landscapes of particular importance for long-term koala conservation. The analysis integrates statewide vegetation mapping, planning datasets, conservation layers and regional corridor mapping

within a single spatial framework to identify areas where koala habitat and connectivity are likely to experience ongoing fragmentation pressure.

The majority of koala habitat across the study area comprises lower carrying-capacity habitat associated with the extensive sandstone landscapes of the Sydney Basin, while higher carrying-capacity habitat is comparatively limited and concentrated on more fertile landscapes that are also favoured for urban development. Importantly, 'low carrying capacity' does not equate to 'low value'; only that larger expanses of this habitat type are required to support koalas due to associated large home range requirements. The persistence of koala populations across the Sydney Basin is likely to depend not only on the retention of habitat patches themselves, but also on the maintenance of functional connectivity across the broader landscape matrix.

The analysis identified 65,124 ha of koala habitat across eight focal-area LGAs as falling within one of the three identified risk categories. This represents habitat where current planning settings, land tenure or proximity to development indicate an elevated likelihood of clearing, modification or fragmentation; it should not be interpreted as a prediction that all identified habitat will ultimately be cleared. Nevertheless, the scale of exposure is substantial, particularly given that the Focal Areas were selected because they support evidence of generationally persistent koala populations. Furthermore, comparison with recent satellite imagery in selected case studies indicates that portions of habitat identified as being at risk have already been cleared, demonstrating that land-use transition is actively occurring rather than representing a purely theoretical future risk.

Patterns of clearing pressure differed substantially between landscapes and habitat types. In many urban growth areas, particularly within Campbelltown / Wollondilly and Liverpool, areas of higher carrying capacity habitat intersected Greenfield Housing Code Areas, Urban Release Areas, CPCP Certified Urban Capable Lands, infrastructure corridors and other urban growth planning frameworks. The proportional exposure can be considerable: Liverpool has the highest overall proportion of mapped PKH within a risk category, at 52%, while 77% of its Primary habitat and 84% of its Class 2A habitat are exposed to identified risk. In contrast, in landscapes subject to lower levels of urban development pressure, substantial areas of lower carrying capacity habitat occur within State Forest tenure, particularly within Wingecarribee, Cessnock and Hawkesbury LGAs.

These findings are significant in the context of the NSW Government's objective of doubling koala numbers by 2050. Population recovery requires sufficient habitat not only to maintain existing populations, but to accommodate population growth, dispersal and future range expansion. Continued loss or fragmentation of habitat is therefore difficult to reconcile with long-term population expansion unless equivalent ecological capacity is restored and demonstrated elsewhere.

A key finding of this report is the extent to which mapped koala connectivity pathways intersect landscapes subject to current and future development pressure. Across multiple Focal Areas, corridors identified through regional biodiversity strategies, koala plans of management and government-supported planning processes overlap areas associated with urban expansion, infrastructure growth and other land-use change. While this does not demonstrate that these corridors will necessarily be lost, it highlights an ongoing tension between mapping connectivity and maintaining functional connectivity. Identification of a corridor does not, in itself, secure its ecological function. Long-term conservation outcomes require corridor mapping and ecological information to meaningfully inform statutory planning and management decisions so that mapped pathways remain vegetated, permeable and functional.

The findings suggest that koala conservation planning within the Sydney Basin has become increasingly effective at identifying important habitat and connectivity values, but that recognition has not consistently translated into long-term protection. The same landscapes may simultaneously be identified as important for koala movement and be subject to planning frameworks that facilitate development or vegetation disturbance. This creates an important challenge for the conservation of a species listed as Endangered under the Commonwealth *EPBC Act* and NSW *BC Act* and for the achievement of the NSW Government's stated population-recovery objective.

The report also highlights important limitations in current conservation accountability frameworks. Substantial investment has occurred in koala conservation planning, habitat protection, restoration, mitigation and baseline monitoring; however, conservation activity is not equivalent to demonstrated ecological improvement. Reporting based on expenditure, projects delivered, hectares nominated for protection or infrastructure constructed provides meaningful measures of inputs and outputs, but does not establish whether local koala habitat extent, connectivity or population viability have improved. Evaluation of conservation success

ultimately requires measurable ecological outcomes including whether corridors remain functional, mortality is reduced and koala populations are stable or increasing.

At present, publicly available information does not allow many of these questions to be answered at a regional scale. Current datasets provide relatively strong information regarding vegetation extent and planning overlap, but substantially less information regarding corridor condition and functionality, cumulative fragmentation impacts, habitat change through time and long-term koala population response to landscape change. The central accountability question is therefore not simply whether conservation action is occurring, but whether those actions are sufficient to counterbalance continuing habitat loss and fragmentation. This report provides both a regional-scale assessment of development pressure affecting koala habitat and a transparent, repeatable spatial decision-support framework that can be updated and refined as new planning datasets and conservation information become available.

2. Introduction / Background

2.1 Koala conservation status

The koala (*Phascolarctos cinereus*) is listed as Endangered under both the Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999 (*EPBC Act*) for populations occurring in New South Wales (NSW), Queensland and the Australian Capital Territory and the NSW *Biodiversity Conservation Act* 2016 (*BC Act*). These listings reflect substantial long-term declines associated with habitat loss, fragmentation, vehicle strike, dog attack, disease, altered fire regimes and climate-related pressures. Habitat loss and fragmentation are widely recognised as primary threatening processes affecting koalas across eastern Australia (DECC 2008; McAlpine *et al*. 2007). Urban expansion and associated infrastructure development are of particular concern within peri-urban landscapes where remnant koala habitat can coincide with areas targeted for residential and industrial growth. Fragmentation of habitat not only reduces habitat extent, but can also disrupt movement pathways, isolate local populations and increase mortality risks associated with roads and urban environments.

The Sydney Basin Bioregion retains extensive koala habitat and supports regionally significant koala populations, including those occurring within south-west Sydney, the Lower Hunter and parts of the Hawkesbury landscape. Previous analyses have demonstrated that koalas remain broadly distributed throughout much of the Bioregion, although occupancy and density vary substantially according to vegetation composition, underlying soil fertility and landscape configuration (Biolink 2023).

Of particular significance is the Campbelltown / Wollondilly koala population in south-west Sydney, which represents one of the few koala populations in NSW considered to have demonstrated recent recovery and spatial expansion. At the same time, this population occurs within one of the fastest-growing urban regions in Australia and is increasingly exposed to landscape fragmentation, road mortality and urban development pressures. More broadly, many koala populations across the Sydney Basin now persist within landscapes undergoing rapid land use transition, highlighting the importance of maintaining habitat connectivity and reducing cumulative fragmentation impacts over time.

2.2 Koala habitat and connectivity in the Sydney Basin

The Sydney Basin Bioregion supports a diverse mosaic of koala habitat extending across coastal lowlands, sandstone plateaux, river valleys and peri-urban landscapes. Habitat type and carrying capacity vary considerably across this region according to the dominance and distribution of Preferred Koala Food Tree (PKFT) species and landscape fertility. Higher carrying capacity koala habitat is generally associated with fertile alluvial and transitional landscapes supporting preferred feed tree assemblages, while extensive portions of the Sydney Basin support lower carrying-capacity habitat associated with comparatively infertile sandstone-derived vegetation communities. Despite generally supporting lower koala carrying capacities, these broader sandstone landscapes play a crucial role and all types of koala habitat collectively act to maintain regional-scale habitat connectivity. Note that 'low carrying capacity' does not equate to 'low value'; only that larger expanses of this habitat type are required to support koalas due to associated large home range requirements. The persistence of koala populations across the Sydney Basin is likely to depend not only on the retention of habitat patches themselves, but also on the maintenance of functional connectivity across the broader landscape matrix.

Connectivity influences dispersal, gene flow, recolonisation potential and population resilience, while fragmentation can increase mortality risks associated with roads, dog attack and movement through urban landscapes. In response, numerous regional corridor strategies, koala plans of management and strategic conservation frameworks have been developed across portions of the Sydney Basin over recent decades. At the same time, many landscapes identified as important for koala habitat and connectivity continue to intersect areas subject to urban expansion, infrastructure development, forestry operations and other forms of land use transition. While conservation planning frameworks increasingly recognise the importance of koala connectivity, the extent to which these objectives are consistently reflected within statutory planning outcomes remains uncertain in many parts of the Sydney Basin.

2.3 Objectives

The purpose of the current project, undertaken on behalf of the Sydney Basin Koala Network (SBKN) and Total Environment Centre (TEC), is to examine the relationship between koala habitat, connectivity pathways, protected lands and clearing risk across key koala landscapes within the Sydney Basin.

Specifically, the objectives of this report are to:

- Map Preferred Koala Habitat (PKH) across the Sydney Basin using current statewide vegetation mapping.
- Classify mapped PKH according to habitat type and likely koala carrying capacity.
- Compile and assess spatial datasets relating to current and future clearing risk, including urban growth frameworks, infrastructure corridors, forestry tenure and associated land use planning layers.
- Identify areas where mapped PKH intersects clearing risk.
- Examine the spatial relationship between identified koala connectivity corridors, protected lands and areas subject to clearing risk.
- Identify locations where strategic conservation objectives and land use planning frameworks may be in tension.
- Provide a strategic spatial framework and geodatabase to support future koala conservation planning, corridor assessment and policy development across the Sydney Basin.

This report is intended as a strategic regional-scale assessment and should not be interpreted as a prediction of future clearing at individual sites. Rather, the analysis identifies landscapes where koala habitat and connectivity are most likely to be influenced by current planning frameworks, land use transition and associated development pressure.

3. Part One – Identifying Koala Habitat at Risk of Clearing

3.1 Methods

3.1.1 Study Area

The study area comprises the Sydney Basin bioregion (Interim Biogeographic Regionalisation for Australia; IBRA v7; SEWPac 2008), hereafter referred to as the study area. The Sydney Basin bioregion extends across approximately 3,622,700 hectares in eastern NSW and encompasses a diverse and highly modified landscape supporting significant biodiversity values alongside intensive human land use.

The bioregion is characterised by a temperate climate, with generally warm summers and no pronounced dry season, although there is substantial spatial variation. Coastal and escarpment areas experience higher rainfall and milder temperatures, while inland regions (*e.g.* upper

Hunter Valley) are comparatively drier and more continental. These climatic gradients, in combination with topography and geology, contribute to strong ecological variation across the study area. The region is underlain predominantly by Triassic sandstones, shales and coal measures of the Sydney Basin geological formation. This geology strongly influences soil fertility and vegetation distribution. The study area encompasses substantial portions of the catchments of the Hawkesbury–Nepean, Hunter and Shoalhaven river systems, in addition to smaller coastal catchments including the Georges, Hacking, Parramatta, Lake Macquarie and Lake Illawarra systems. These drainage systems have historically structured both vegetation patterns and fauna movement pathways across the landscape.

Prior to European settlement, the study area supported a diverse mosaic of vegetation communities including grassy woodlands, dry and wet sclerophyll forests, rainforest elements, riparian forests and coastal heathlands. Substantive areas of vegetation have subsequently been cleared or modified, particularly on fertile soils and in coastal lowlands, resulting in a contemporary landscape that is highly fragmented in some areas and relatively intact in others.

Approximately 39.9% of the study area is reserved within the formal conservation estate, largely comprising national parks and reserves. While extensive, this reserve system is not spatially representative of all vegetation types, particularly those situated on higher fertility soils. Outside the conservation estate, land uses include agriculture, urban development, extractive industries and infrastructure, with urbanisation strongly concentrated along the coastal corridor and within major growth centres. Major urban centres include Sydney, Newcastle, Wollongong, Nowra, Cessnock, Muswellbrook and Katoomba, reflecting the high level of population pressure within the region.

The study area occurs on the traditional lands of numerous First Nations peoples, including the Yuin, Gundungurra, Tharawal, Dharug, Eora, Guringai, Awabakal, Darkinjung, Wiradjuri, Worimi and Wonnarua peoples, who have longstanding cultural and ecological connections to the landscapes encompassed by this study.

Focal Areas for koala conservation were initially identified in Biolink (2023) and have been used as a framework through subsequent reporting for the Sydney Basin Koala Network. These Focal Areas are defined at the scale of Local Government Areas (LGAs) and are intended to represent landscape units within which coordinated management actions can be effectively directed.

Focal Areas were identified based on the spatial co-occurrence of Preferred Koala Habitat (PKH) and evidence of generational persistence[1] of koala populations. Adjacent LGAs were grouped into a single Focal Area where there is contiguous or functionally connected habitat, and/or evidence of interconnected generational persistence. However, LGAs were not grouped where management frameworks, planning controls or policy contexts differ substantially, even where ecological connectivity may be present. Only LGAs that are principally encompassed by the study area were considered in the delineation of Focal Areas.

The key Focal Areas identified within the study area are:

- Campbelltown / Wollondilly
- Liverpool
- Sutherland
- Wingecarribee
- Hawkesbury
- Cessnock / Lake Macquarie

These Focal Areas represent the primary spatial units for assessing koala habitat distribution, connectivity and exposure to development pressure within the study area.

[1] Generational persistence refers to the repeated occurrence of koalas at a local scale over a period exceeding the lifespan of a single individual, typically demonstrated by records spanning at least 18 years, with detections in each of three successive six-year intervals. This is considered to identify resident source populations of koalas.

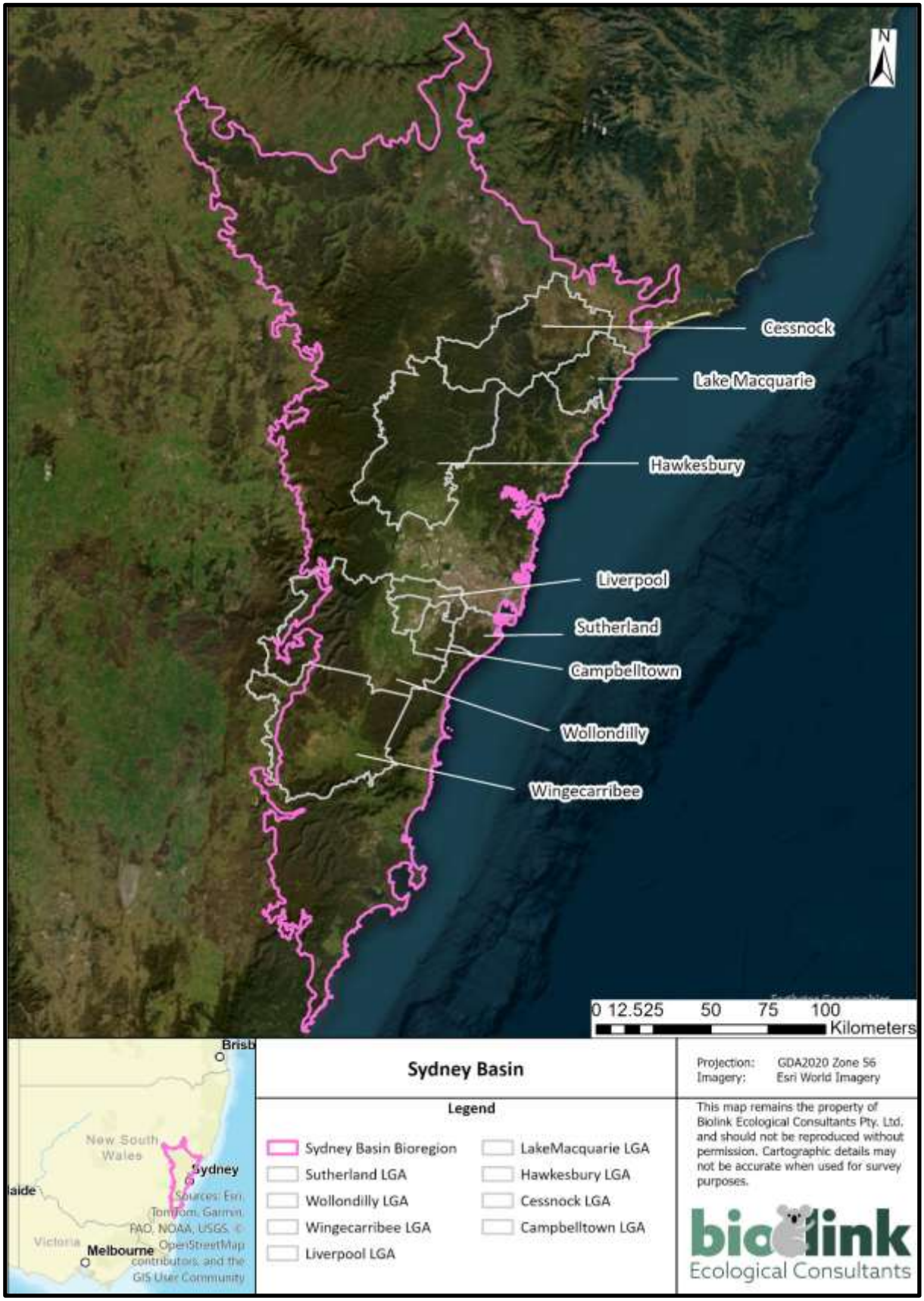


Figure 1. The study area, that being the Sydney Basin Bioregion, indicated in pink outline, with Focal Areas (Campbelltown, Cessnock, Hawkesbury, Lake Macquarie, Liverpool, Sutherland, Wingecarribee and Wollondilly Local Government Areas (LGAs) indicated in light grey outlines.

3.1.2 Preferred Koala Habitat (PKH) mapping

Preferred Koala Habitat (PKH) mapping for the study area was first presented in a baseline report to the Sydney Koala Network (Biolink 2023). For this project, mapping was updated using the most recent version of State-Wide Vegetation Type (SWVT) mapping "C2.0.M2.2", which was released in December 2025 and downloaded from the SEED spatial database in April 2026. The full methods used for PKH identification can be found in Biolink (2023) and a brief version of these methods is presented below, for clarity.

We use a four-tiered, hierarchical koala habitat classification system with habitat quality classes based on the relative abundance (dominance) of Preferred Koala Food Tree (PKFT) species, the presence of which were determined from Plant Community Type (PCT) vegetation descriptions available on BioNet. Each of the habitat classifications in **Table 1** reflect differing koala carrying capacities of the associated vegetation communities, areas of 'Primary' Koala Habitat capable of sustaining high density populations (i.e. > 0.5 koalas ha-1), whereas Secondary (Class C) / Marginal Koala Habitat can only sustain low density populations (i.e. < 0.1 koalas ha-1). Collectively, 'Primary' and 'Secondary' habitat classifications function to identify areas of PKH.

Table 1. Four-tiered koala habitat classification hierarchy criteria as applied to vegetation mapped across the study area.

Koala habitat type	Classification criteria
Primary koala habitat	Forest and/or woodland PCTs occurring on soils of medium to high nutrient value whereupon primary PKFTs are dominant or co-dominant components of the tallest stratum.
Secondary (Class A) koala habitat	Forest and/or woodland PCTs occurring on soils of medium to high nutrient value whereupon primary PKFTs are sub-dominant components of the tallest stratum.
Secondary (Class B) koala habitat	Forest and/or woodland PCTs occurring on soils of low to medium nutrient value whereupon primary PKFTs are absent, the tallest stratum instead dominated or co-dominated by secondary food tree species.
Secondary (Class C) / marginal koala habitat	Forest and/or woodland PCTs occurring on soils of low to medium nutrient value whereupon primary food tree species are absent and secondary food tree species are sub-dominant components of the tallest stratum.
Other	Forest and/or woodland PCTs that do not contain PKFTs.

Some PCT descriptions state that a PKFT species is only sometimes present in the canopy. In these cases, the PCT is coded as *e.g.* 'Other / 2C'. These hybrid categories were retained in the

underlying dataset but consolidated into their higher-order PKH category (*e.g.* 2C/Other displayed as 2C) for ease of visualisation and summary reporting.

Habitat categorisations were based on considerations relating to the presence/dominance of PKFTs, which for the study area comprised the following species[2]:

Primary PKFTs

- Dirty gum (*Eucalyptus chlorocada*)
- Dwyer's red gum (*E. dwyeri*)
- Slaty red gum (*E. glaucina*)
- Tallowwood (*E. microcorys*) on high nutrient (alluvial) soils
- Parramatta red gum (*E. parramattensis*)
- Swamp mahogany (*E. robusta*)
- Red gum (*Eucalyptus tereticornis*) on high nutrient (alluvial) soils

Secondary PKFTs

- Grey gums (*E. punctata, E. canaliculata, E. propinqua*)
- Orange gum (*E. bancroftii*)
- Blue box (*E. baueriana*)
- Blakely's red gum (*E. blakelyi*)
- Monkey gum (*E. cypellocarpa*)
- Woollybutt (*E. longifolia*)
- Maiden's gum (*E. maidenii*)
- Yellow box (*E. melliodora*)
- Tallowwood (*E. microcorys*) on low nutrient soils
- White-topped box (*E. quadrangulata*)
- Steel box (*E. rummeryi*)
- Red gum (*E. tereticornis*) on low nutrient soils

[2] Knowledge about PKFTs comes from *KoalaSAT*, a database containing data from >163,000 trees from >5,100 field sites, each of which have been sampled in the same way for koala presence over time.

3.1.3 Mapped connectivity pathways

Ecological connectivity was represented using a suite of existing biodiversity and koala-specific corridor datasets compiled from multiple sources. These include regional biodiversity corridor mapping developed by the NSW Government, koala habitat and dispersal pathways identified in local-scale studies and corridor mapping developed by the Sydney Basin Koala Network (SBKN) through recent regional-level analyses.

These datasets reflect different methodological approaches, spatial scales and objectives, ranging from broad landscape-scale biodiversity corridors to more targeted representations of koala movement pathways. Accordingly, corridor layers were retained as discrete datasets rather than being merged into a single composite layer. This approach preserves the underlying assumptions and intent of each dataset and enables comparison between corridor frameworks developed in different contexts.

The corridor datasets were used to assess the extent to which mapped connectivity pathways intersect with areas of development pressure (**Section 3.1.4**) and areas subject to conservation or protection mechanisms (**Section 3.1.5**). This allows for the identification of:

- corridors that are largely contained within protected or low-risk areas;
- corridors that intersect areas of current or future development pressure; and
- areas where connectivity outcomes may be inconsistent with planning frameworks.

It is noted that mapped corridors represent potential movement pathways based on habitat suitability, landscape structure and/or modelling approaches, and do not necessarily reflect confirmed patterns of use by koalas. The functional value of any given corridor is dependent on local habitat condition, configuration and the presence of barriers to movement.

Table 2. Habitat corridor layers used in spatial analysis, inclusive of data sources.

Layer Name	Description / Year	Custodian	Source
Cessnock LGA Structural Connectivity Corridors	Derived for connectivity analysis within Cessnock LGA, associated with local biodiversity / review of LEP (2021-2022)	Cessnock City Council / DCCEEW	SEED
Illawarra Shoalhaven Regional Biodiversity Corridors	Regional biodiversity corridor mapping associated with Illawarra Shoalhaven Regional Plan (2023)	NSW DPE	SEED

Layer Name	Description / Year	Custodian	Source
Illawarra Shoalhaven Regional Plan Corridors	Derived from Illawarra Biodiversity Strategy and South Coast Corridor Mapping Project. Original mapping based on 2011 and 2013 data sets	NSW DPE	SEED
South East and Tablelands Regional Plan Corridors	Regional biodiversity corridor mapping for South East and Tablelands Regional Plan 2036 (updated datasets through 2024)	NSW DPE	SEED
Cumberland Subregion BIO Map – Biodiversity Corridors of Regional Significance	Key linkages of native vegetation and priority investment areas across Western Sydney, as identified by OEH (now DCCEEW) as part of NSW governments Green Corridors Program (2016)	NSW DPE / DCCEEW	SEED
South West Sydney Koala Corridors	NSW government strategic koala corridor mapping associated with south-west Sydney growth and biodiversity planning processes (2019)	NSW DPE / DCCEEW	SEED
Campbelltown LGA Strategic Linkage Areas	Key koala Strategic Linkage Areas across the Campbelltown City Council LGA intended to direct funding and protection via conservation agreements, as described in the Campbelltown CKPoM (2019)	Campbelltown City Council	Derived from CKPoM
Greater Sydney Habitat Corridor*	SBKN – Greater Sydney Habitat Corridor Report (2025)	SBKN	SBKN

* This layer was not developed directly through NSW Government or local government strategic planning processes, but instead represents an independently derived regional-scale connectivity framework.

3.1.4 Identifying koala habitat at risk

Clearing risk was represented using a combination of the existing urban footprint and areas identified for future urbanisation under current planning frameworks. For the purposes of this report, clearing risk refers to the likelihood that land will be subject to clearing or modification associated with urban, industrial or infrastructure development, either directly or indirectly. In addition to urban and infrastructure-related development, areas subject to vegetation modification under other land use and tenure frameworks (*e.g.* timber harvesting within State Forests) were included where these represent spatially predictable sources of habitat disturbance and fragmentation.

Risk categories were defined based on the degree to which planning frameworks or land use settings commit land to development or disturbance, ranging from formally certified urban land to indirect exposure through proximity to urban interfaces. Additional datasets representing major infrastructure and strategic growth areas were incorporated as these are known to drive land use change, habitat fragmentation and edge effects across the landscape (**Table 3**).

Existing road networks were not included as roads represent an established mortality and fragmentation threat but do not necessarily indicate future clearing or urban expansion. To avoid conflating existing threats with clearing risk, transport infrastructure was included only where it is identified for future road-widening or represents planned or growth-related infrastructure, or where it forms part of a broader strategic development framework.

Strategic growth areas such as the Wilton Priority Growth Area and Greater Macarthur Growth Area were not mapped as discrete spatial layers, as their spatial expression is captured through more detailed planning datasets, including Future Residential Growth Areas, Urban Release Areas, zoning and CPCP land categories, as described in **Table 3**.

Clearing risk was classified into three tiers:

- Tier 1 – **High risk**. Areas where clearing or habitat disturbance is approved, enabled under statutory (including legacy) planning frameworks, and / or highly likely to occur within planning timeframes. This includes lands subject to certified urban development, complying development pathways, major infrastructure and State Significant Development as well as areas subject to ongoing vegetation modification under established land use frameworks (*e.g.* timber harvesting within State Forests).
- Tier 2 – **Emerging risk**. Areas where there is strong planning intent for development and where clearing or disturbance is likely to occur but is not yet fully committed or spatially resolved. This includes areas identified for future urban expansion, land use zoning that permits development and strategic growth areas where planning processes are ongoing.
- Tier 3 – **Urban Interface risk**. Areas where habitat is currently exposed to indirect impacts associated with nearby development, including fragmentation, edge effects and the potential for incremental expansion of urban or infrastructure footprints. This is to acknowledge habitat exposed to a landscape context in which future clearing pressure is elevated and comprises buffers around existing urban areas, infrastructure and higher-risk zones - 1 km buffer applied around Tier 1 and Tier 2, excluding State Forests which were not buffered as forestry operations are determined by compartment planning rather than progressive expansion into adjoining land.

To avoid double counting, risk layers were applied hierarchically with overlap removed between tiers. Tier 2 excludes areas already classified as Tier 1, and Tier 3 excludes areas in

both Tier 1 and Tier 2. Risk layers were clipped to remove protected habitat (described in **Section 3.1.5**) except where the risk layer represents a spatially explicit approved, certified or planned infrastructure/development footprint. These layers (Tiers 1 - 3) provide an indication of current exposure to clearing risk, not confirmed clearing. Spatial overlay analysis was used to identify the extent to which mapped koala habitat and connectivity pathways intersect with areas subject to this pressure.

Table 3. Development pressure (risk) layers used in spatial analysis, including data sources and which Tier of risk (Tier 1 = High risk, Tier 2 = emerging risk, Tier 3 = Urban Interface risk).

Layer Name	Dataset Name (Formal)	Custodian	Downloaded from	Tier
Certified Urban Capable Land	CPCP – Land Category	NSW DPI	SEED	High Risk
Certified Major Urban Transport Corridor	CPCP – Land Category	NSW DPI	SEED	High Risk
Greenfield Housing Code Area	Greenfield Housing Code	NSW DPI	Planning Portal / SEED	High Risk
Growth Centre Certification	Growth Centres Biodiversity Certification – 'Existing Certified' lands*	NSW OEH (legacy)	SEED	High Risk
State Significant Development	SSD Sites / Major Projects	NSW DPI	SEED / REST	High Risk
State Forest	State Forest Estate	Forestry Corporation NSW	SEED	High Risk
Urban Release Areas	Urban Release Areas	NSW DPI	SEED / Planning Portal	Emerging Risk
Industrial Release Areas	Industrial Lands / Release Areas	NSW DPI	Planning Portal / SEED	Emerging Risk
Future Residential Growth Area	Future Residential Growth Areas	NSW DPI	REST / Planning Portal	Emerging Risk
Land Zoning (EPI / LEP)	Residential, Industrial, Commercial, Transition**, Infrastructure (future transport corridor, road widening, quarry, public transport corridor), Special Activities (mining, extractive industries)	NSW DPI	Planning Portal / SEED	Emerging Risk
Growth Centre Certification	Growth Centres Biodiversity Certification – 'Existing non-Certified' lands***	NSW OEH (legacy)	SEED	High Risk
Urban Interface Buffer	Derived	N/A	GIS Processing	Urban Interface Risk

*Earlier generation strategic approval which is still valid in some locations (approved clearing framework) but overlaps with CPCP and may be functionally redundant where CPCP applies.

**The Transition land use category represents a buffer /staging zone between rural and urban land and often occurs where urban expansion is anticipated but not yet re-zoned or committed.

*** These lands fall within a strategic urban growth framework and remain subject to future planning processes, but biodiversity certification does not apply and the ultimate development footprint is not yet fully committed or spatially resolved.

3.1.5 Identifying protected koala habitat

Spatial datasets were compiled to identify areas where PKH occurs within land subject to formal or informal conservation mechanisms under current land tenure and policy frameworks (**Table 4**). These include lands reserved within National Parks estate, areas secured for conservation under strategic planning instruments, sites managed through biodiversity offset and stewardship schemes and areas zoned for Environmental Conservation (C2) under local planning frameworks. Land zoned as Environmental Management (C3) was not included as this zoning permits a range of land uses and does not, in itself, prevent vegetation clearing or development.

This layer is used to estimate the extent to which PKH occurs within areas that are unlikely to be exposed to immediate or medium-term clearing or development-related disturbance.

It is noted that the presence of a conservation designation does not imply that habitat is secure or free from disturbance. Protected areas may still be subject to significant impacts, including wildfire, drought and other pressures. For example, the 2019–2020 bushfires resulted in extensive impacts to vegetation across the National Parks estate within the study area, including large areas supporting PKH. Further, while some protected areas may contribute to landscape-scale connectivity, this is dependent on their size, condition and spatial configuration within the broader landscape. Environmental zoning under Local Environmental Plans (LEPs) may be subject to re-zoning and can include a limited range of permitted uses and therefore does not guarantee long-term protection.

Crown Reserves were not included as these do not necessarily represent flora / fauna reserves and sometimes designate education and agricultural facilities.

Table 4. Protected areas layers used in spatial analysis, inclusive of data sources.

Layer Name	Dataset Name (Formal)	Custodian	Source
Strategic Conservation Area	CPCP Strategic Conservation Area	NSW DPI	SEED
Georges River Koala Reserve	CPCP Georges River Koala Reserve	NSW DPI	SEED
Protected Koala Habitat	CPCP Protected Koala Habitat	NSW DPI	SEED
NPWS Estate	NSW National Parks Estate	NSW NPWS	SEED
Biodiversity Stewardship Agreements	Biodiversity Stewardship Sites	NSW BCT	SEED
Land Zoning (EPI / LEP)	Environmental Conservation	NSW DPI	Planning Portal / SEED
Environmental Conservation Area	SEPP (Precincts) 2021	NSW DPI	SEED

3.1.6 Spatial analysis

Spatial analysis was undertaken in ArcGIS Pro (ESRI) to quantify the extent of mapped PKH occurring within each development pressure risk category *i.e.* High Risk (Tier 1), Emerging risk (Tier 2) and Urban Interface Risk (Tier 3) as described in **Section 3.1.4**. The mapped PKH layer was intersected with each risk tier using standard geoprocessing functions to identify areas of overlap between PKH and development pressure surfaces. This enabled calculation of the area (ha) of each PKH category occurring within each risk tier. Area calculations were undertaken in a projected coordinate system suitable for regional-scale spatial analysis (GDA94 NSW Lambert). Spatial overlays were also examined in relation to mapped corridor datasets to identify areas where habitat connectivity may be vulnerable to further fragmentation or land use change.

3.2 Results and Discussion

3.2.1 Sydney Basin (study area)

There is 1,854,101 ha of mapped koala habitat across the study area, accounting for 51% of the total land surface area. The predominant koala habitat category across the study area is Secondary (2C), which accounts for 31% of the land surface area, followed by 2B at 15%, 2A at 4% and Primary at 1% (**Figure 2**). **Appendix 1** displays all PCTs which are mapped within the study area with their associated PKH categories and which PKFT species are present in each.

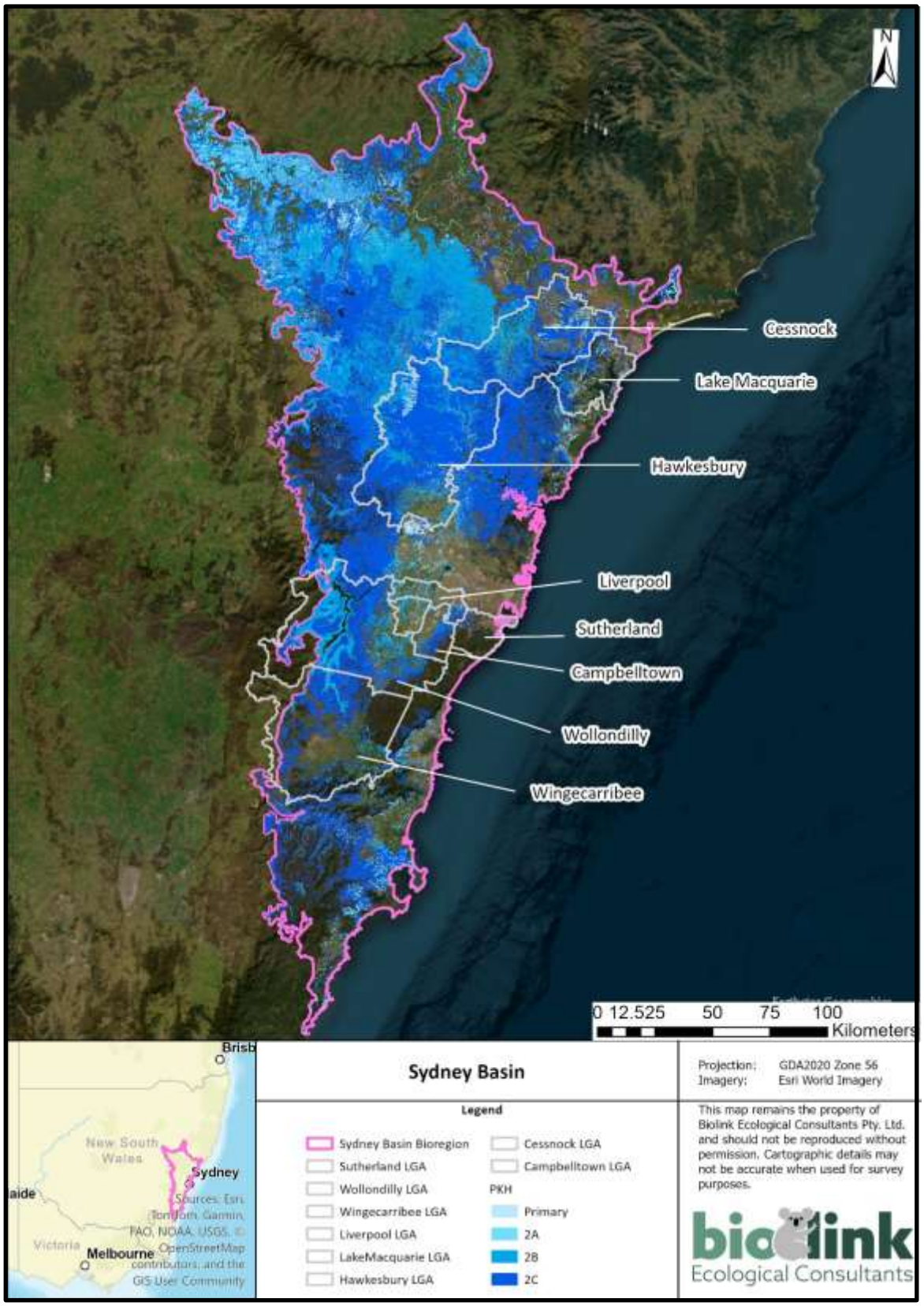
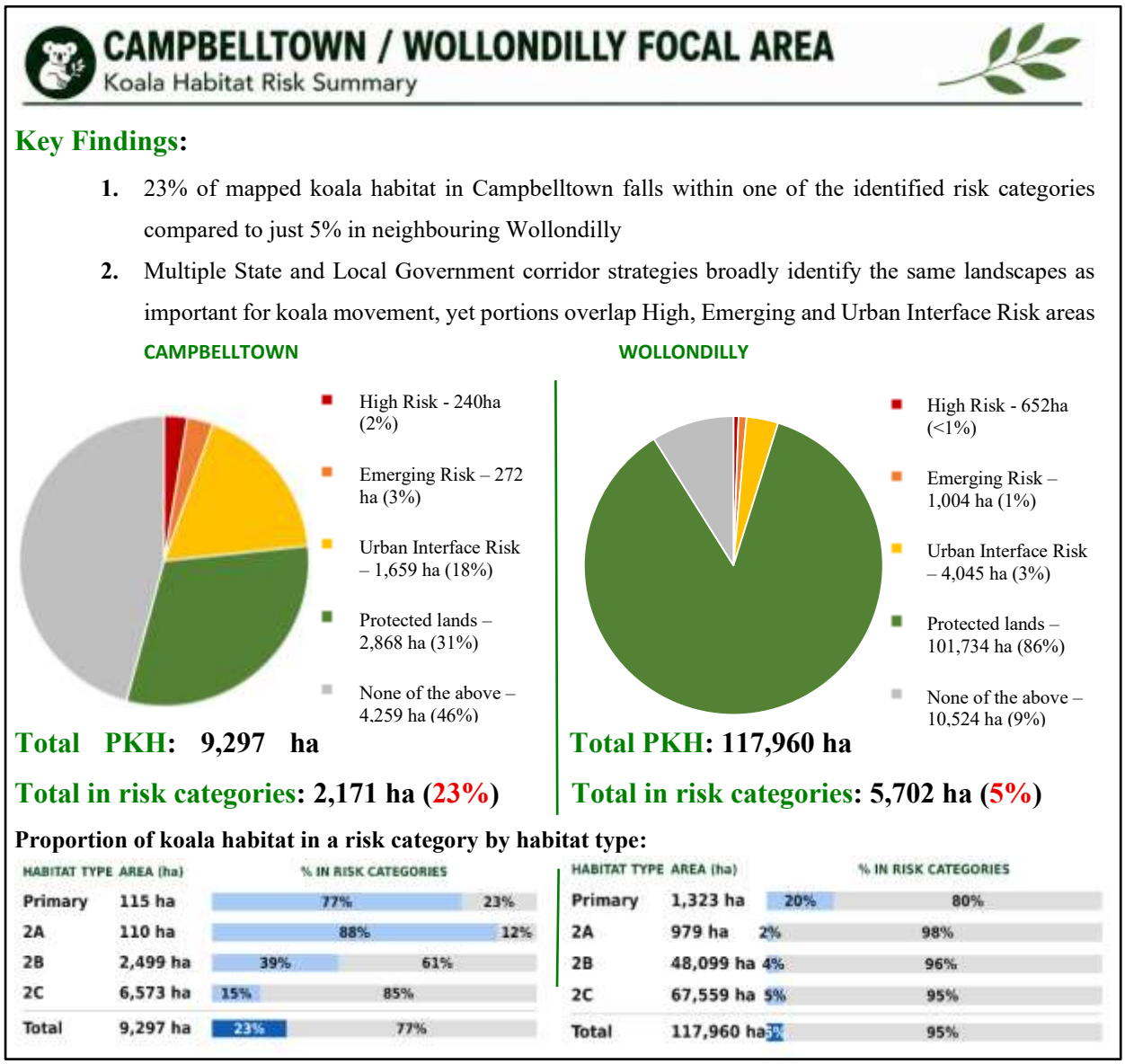


Figure 2. Preferred Koala Habitat (PKH) across the study area (Sydney Basin Bioregion), indicated in pink outline, with Focal Areas (Campbelltown / Wollondilly, Hawkesbury, Cessnock / Lake Macquarie, Liverpool, Sutherland and Wingecarribee Local Government Areas (LGAs)) indicated in light grey outlines. Categories of PKH are Primary and Secondary classes (Primary, 2A, 2B, 2C), which refer to different koala carrying capacities of the vegetation. Primary PKH is shown in lightest blue, progressing to 2C in darkest blue.

3.2.2 Campbelltown / Wollondilly Focal Area



Results

Mapped PKH is widespread across both the Campbelltown and Wollondilly LGAs, however habitat within Campbelltown is generally more fragmented and urban-influenced, whereas Wollondilly retains larger and more consolidated tracts of contiguous habitat (**Figure 3a**). In total, 9,297 ha of land within Campbelltown and 117,960 ha within Wollondilly[3] (30% and 60% of their total land surface areas respectively) are mapped as supporting PKH. Considered

[3] Consistent with previous reporting, only the portion of Wollondilly LGA which falls within the study area was assessed. The LGA extends to the west beyond the bounds of the Sydney Basin Bioregion.

collectively, 1,438 ha is classified as Primary PKH, 1,089 ha as 2A, 50,598 ha as 2B and 74,132 ha as 2C. A further 40,077 ha is classified as 'Other' vegetation (non-PKH).

Areas identified as being at High Risk (Tier 1) are concentrated at the interface of the two LGAs, particularly in areas of urban expansion around Gilead, Menangle Park, Varroville and Glenfield (Campbelltown) and around Appin and Wilton (Wollondilly) where substantial land use change is currently occurring or strategically enabled. These High Risk areas typically intersect land associated with the Greenfield Housing Code and CPCP Certified Urban Capable Land. Smaller areas of PKH at High Risk also occur within future transport corridors and associated infrastructure expansion areas west of Appin Road (*e.g.* Campbelltown Road, Denham Court Road, Gregory Hills Drive) and in Greenfield Housing Code areas around Tahmoor, Thirlmere and Silverdale (Wollondilly) (**Figure 3b**).

The urban belt of Campbelltown, extending from Glenfield in the north to Menangle Park in the south, comprises most land identified as Emerging Risk (Tier 2), with smaller isolated areas occurring around Silverdale, The Oaks, Oakdale, Tahmoor, Thirlmere, Bargo, Picton and Menangle (Wollondilly). These areas were primarily identified as being at risk due to current residential zoning, Future Residential Growth Areas and Urban Release Areas and do not support extensive koala habitat.

Areas identified as being subject to Urban Interface Risk (Tier 3) broadly reflect the spatial distribution of the High Risk and Emerging Risk layers and are spread throughout western and central Campbelltown and eastern Wollondilly.

In terms of PKH categories, Primary habitat exhibits the greatest proportional exposure to development pressure, with 77% of its mapped extent in Campbelltown and 20% of its extent in Wollondilly occurring within one of the identified risk tiers (**Table 5**). The proportion of PKH occurring on protected land differs markedly between the two LGAs; 101,734 ha (86%) of mapped PKH in Wollondilly intersects Protected Land compared to 2,868 ha (31%) in Campbelltown. This pattern reflects the more extensive NPWS tenure and consolidated bushland landscapes present across Wollondilly.

There are several areas of overlap between High / Emerging Risk layers and mapped Protected Lands. For example, an area near Ingleburn identified within the Campbelltown LEP as a future transport corridor also intersects CPCP Protected Koala Habitat and the CPCP Georges River Koala Reserve. Similarly, near Wilton, areas identified as Urban Release Areas / Precincts –

Western Parkland City intersect CPCP Strategic Conservation Areas. These overlaps indicate areas where strategic conservation mapping and development-related planning frameworks spatially coincide. The extent to which earlier planning frameworks remain operational, constrained or superseded under newer conservation planning mechanisms is not always clear from publicly available spatial data.

In terms of landscape connectivity, a BIO Map Cumberland Subregion corridor extends along the western boundary of Campbelltown LGA and is split in several locations by Existing Certified land which buffers transport infrastructure (*e.g.* Raby Rd, Badgally Rd, Narellan Rd). Further, portions of Campbelltown City Council's Strategic Linkage Areas, as identified in the Campbelltown Comprehensive Koala Plan of Management (CKPoM), traverse areas of High, Emerging and Urban Interface Risk, particularly around Gilead and Menangle where corridors intersect CPCP Certified Urban Capable Land. The South West Sydney Koala Corridors layer also exhibits overlap with High and Emerging Risk areas around Wilton, as well as Urban Interface Risk areas near Kentlyn and Wedderburn. Collectively, these patterns indicate that several identified connectivity pathways occur within landscapes subject to ongoing urban expansion and fragmentation pressure.

Case Study: **Figure 4a** illustrates part of the Wilton Growth Area where substantial areas of koala habitat coincide with various planning and conservation designations. High Risk areas are primarily associated with CPCP Certified Urban Capable Land and Greenfield Housing Code Areas, while some adjoining areas are identified as Protected Land under the CPCP Strategic Conservation Area and other conservation planning layers. Emerging Risk and Urban Interface Risk occur throughout the surrounding landscape, producing a complex mosaic of sometimes overlapping planning designations. Comparison with recent satellite imagery (**Figure 4b**) indicates that portions of the mapped habitat have already been cleared, demonstrating that land use transition is actively occurring. However, from the publicly available spatial datasets it is not possible to determine which remaining habitat is intended to be retained and which areas are ultimately expected to be developed.

Table 5. Amount of PKH (in ha) in the Campbelltown / Wollondilly Focal Area which falls into one of the 'risk' categories, those being High Risk, Emerging Risk and Urban Interface Risk. Bottom row shows the amount and % of each habitat type which falls into a risk category, *i.e.* 20% of Primary PKH in Wollondilly falls into a risk category.

		Primary	2A	2B	2C	Total
Campbelltown	High Risk	5 ha	13 ha	196 ha	26 ha	240 ha
	Emerging Risk	26 ha	14 ha	177 ha	55 ha	272 ha
	Urban Interface Risk	58 ha	69 ha	614 ha	918 ha	1,659 ha
Total		**89 ha (77%)**	**96 ha (87%)**	**987 ha (39%)**	**999 ha (15%)**	**2,171 ha (23%)**
Wollondilly	High Risk	1 ha	-	350 ha	301 ha	652 ha
	Emerging Risk	28 ha	-	278 ha	699 ha	1,005 ha
	Urban Interface Risk	235 ha	20 ha	1,387 ha	2,403 ha	4,045 ha
Total		**264 ha (20%)**	**20 ha (2%)**	**2,015 ha (4%)**	**3,403 (5%)**	**5,702 ha (5%)**

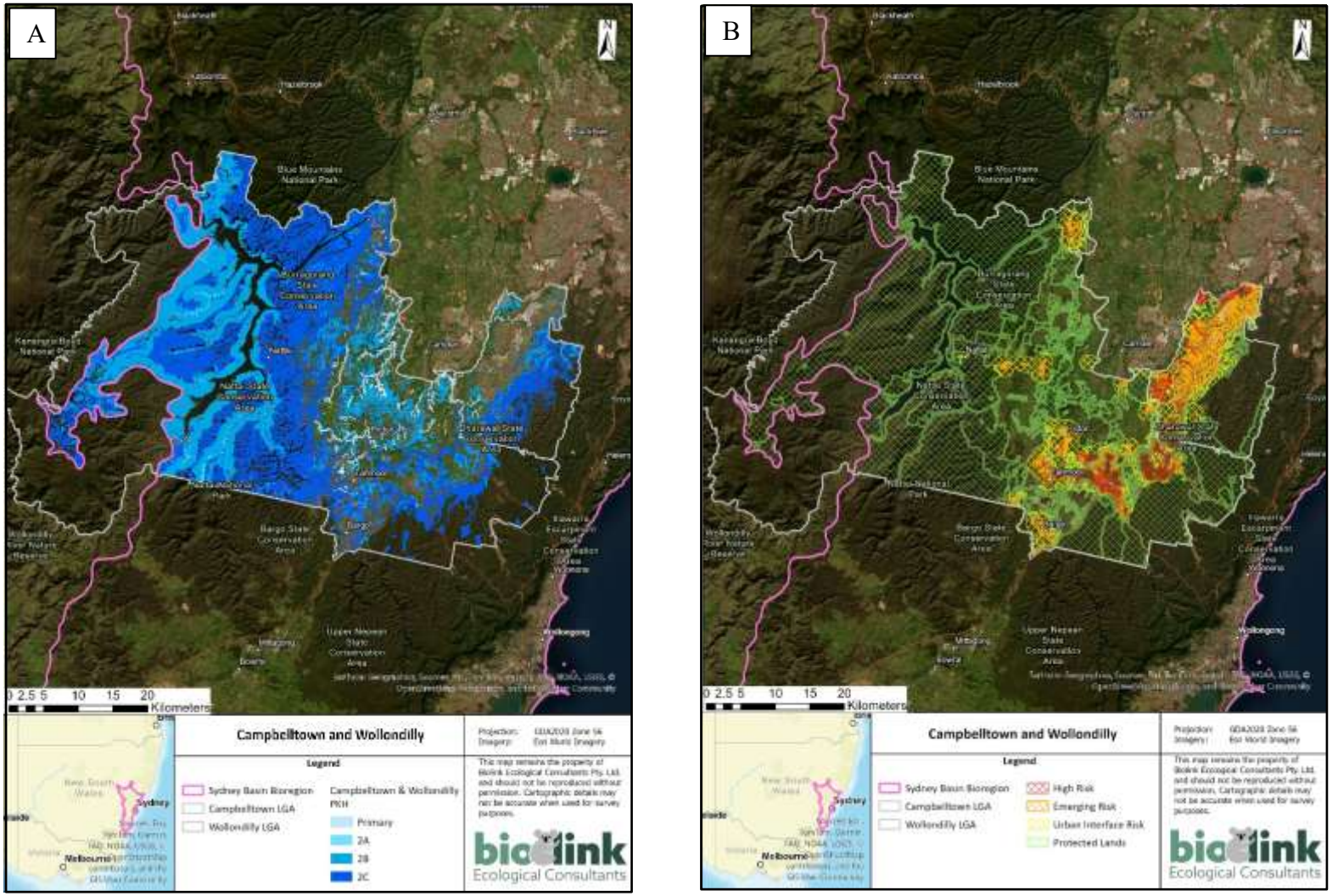


Figure 3. Preferred Koala Habitat (PKH) across the Campbelltown / Wollondilly Focal Area shown in (**A**) with various shades of blue indicating different potential carrying capacities of habitat. Risk tiers and Protected land overlays across the same area shown in (**B**), with High Risk in red cross-hatch, Emerging Risk in orange cross-hatch, Urban Interface Risk in yellow cross-hatch and Protected lands in green cross-hatch.

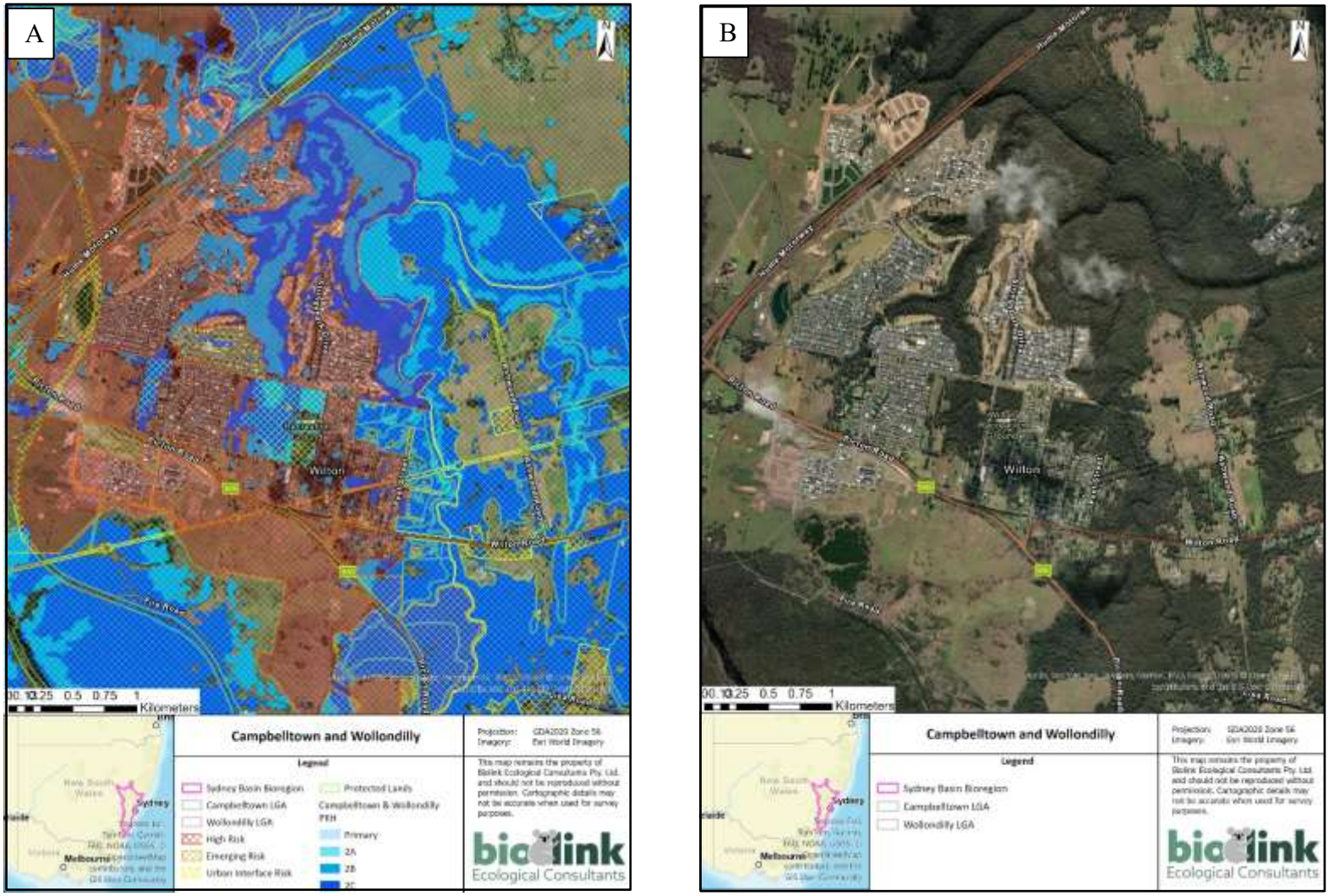


Figure 4. Case study of a section of Wollondilly LGA in the vicinity of Wilton, showing the intersect of PKH (various shades of blue) and High Risk classification (red cross-hatch), Emerging Risk (orange cross-hatch), Urban Interface Risk (yellow cross-hatch) and Protected Lands (green cross-hatch) (**A**). Note that some vegetation has already been cleared since this mapping was produced (see north-west). The underlying satellite imagery is shown in (**B**), to aid clarity.

Discussion

The Campbelltown / Wollondilly Focal Area illustrates several broader themes that emerge throughout the Sydney Basin. First, the analysis demonstrates that development pressure is disproportionately concentrated within the habitat types with the highest potential koala carrying capacity. Across Campbelltown, 77% of mapped Primary habitat and 87% of Class 2A habitat fall within one of the identified risk categories. This reflects the long-recognised tendency for urban expansion to occur on more fertile landscapes.

Secondly, this Focal Area highlights an apparent inconsistency between strategic conservation planning and statutory land use planning. Multiple government-supported connectivity frameworks, including the BIO Map Cumberland Subregion Regional Corridors[4], South West Sydney Koala Corridors[5] and Campbelltown City Council's Strategic Linkage Areas[6], identify broadly similar landscapes as being important for maintaining koala movement across south-west Sydney. However, portions of these mapped corridors intersect areas that fall within a risk category, particularly around Gilead, Menangle and Wilton. While overlap between corridor mapping and future urban development does not necessarily indicate that connectivity outcomes will ultimately fail, it raises questions regarding how these strategically important movement pathways are intended to remain functional as urbanisation proceeds.

Finally, the Wilton case study highlights the difficulty of evaluating likely conservation outcomes using publicly available planning information. The landscape contains overlapping biodiversity certification, conservation and development planning layers, yet it remains difficult to determine which areas of mapped koala habitat are ultimately intended to be retained, which are expected to be cleared, and how retained habitat will continue to function as part of the broader connectivity network. As a consequence, it is also difficult to assess how current planning outcomes contribute to the NSW Government's objective of doubling koala numbers by 2050.

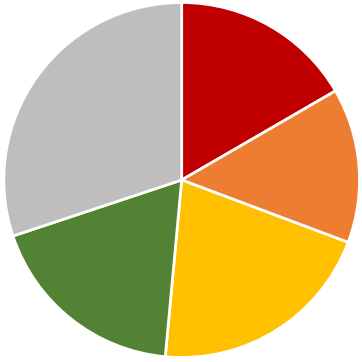
[4] The Biodiversity Investment Opportunities Map (BIO Map) project was a key deliverable of the NSW Government's Green Corridors Program, funded by the NSW Environmental Trust and intended to identify priority investment areas for biodiversity conservation and restoration (2016)
[5] NSW government strategic koala corridor mapping associated with south-west Sydney growth and biodiversity planning processes, produced by DPE / DCCEEW (2019)
[6] From the Campbelltown CKPoM

3.2.3 Liverpool Focal Area

LIVERPOOL FOCAL AREA
Koala Habitat Risk Summary

Key Findings:

1. Over one half (52%) of koala habitat falls within one of the identified risk categories, while only 18% is protected. The remaining 30% is neither protected nor currently subject to clearing risk (predominantly Holsworthy Military Base)
2. Habitat with the highest potential carrying capacity is most at risk. 77% of Primary and 84% of 2A habitat are considered at risk.



- High Risk – 1,448 ha (17%)
- Emerging Risk – 1,227 ha (14%)
- Urban Interface Risk – 1,807 ha (21%)
- Protected lands – 1,604 ha (18%)
- None of the above – 2,622 ha (30%)

Proportion of koala habitat in a risk category by habitat type:



Total PKH: 8,708 ha

Total in risk categories: 4,482 ha (52%)

Results

In the Liverpool LGA, mapped PKH occurs in large, consolidated areas in the south-east in the vicinity of Holsworthy Military Base, and to a lesser extent in the far west, in Gulguer Nature Reserve and surrounds; fragmented PKH occurs throughout the central portion of the LGA (**Figure 5a**). In total, 8,708 ha of land in Liverpool (28% of the total land surface area) is mapped as supporting PKH; 1,204 ha is classified as Primary PKH, 361 ha as 2A, 4,192 ha as 2B and 2,951 ha as 2C. A further 1,545 ha is classified as 'Other' vegetation (non-PKH).

Areas identified as being at High Risk (Tier 1) of habitat modification and clearing pressure are concentrated in the central portion of the LGA, from Kemps Creek in the north to Rossmore in the south, as well as a smaller area around Edmondson Park and Leppington. These High Risk areas intersect land associated with the Greenfield Housing Code and Growth Centre Land Certification (**Figure 5b)**.

Emerging Risk (Tier 2) is concentrated primarily within the already urbanised eastern portion of the LGA, where native vegetation cover is already limited, and in some riparian areas in the

centre of the LGA. These risk designations are driven by existing residential zoning (in the east) and by Growth Centre Land which is currently non-certified, meaning that it is subject to future planning processes but biodiversity certification does not apply (centre of the LGA). These north-south running riparian corridors correspond closely with the BIO Map Cumberland Subregion Regional Corridors layer. The surrounding landscape is primarily associated with Greenfield Housing Code Areas and Growth Centres Biodiversity Certification land (High Risk).

Areas identified as being subject to Urban Interface Risk (Tier 3) broadly mirror the spatial distribution of the High Risk and Emerging Risk layers, although the most extensive and contiguous Tier 3 areas occur within the western portion of the LGA.

In proportional terms, koala habitat with the highest potential carrying capacity also has the highest exposure to risk, with 77% of Primary PKH and 84% of 2A PKH within Liverpool being subject to current or future exposure to development pressure (**Table 6**).

Case Study: Figure 6a, 6b illustrates a section of western Liverpool LGA that supports PKH and is classified as Tier 1 (High Risk) under the clearing risk framework. The High Risk classification arises primarily from land identified as Certified Urban Capable under the CPCP, together with areas mapped as Existing Certified under the Growth Centres Biodiversity Certification framework and a small area associated with the Bradfield City Centre State Significant Development. Recent aerial imagery indicates that much of the area currently comprises low-density rural and rural-residential land supporting a mix of scattered and consolidated native vegetation. The spatial analysis identifies an area where substantial mapped koala habitat coincides with planning frameworks that facilitate future urban development and associated vegetation clearing.

Table 6. Amount of PKH (in ha) in Liverpool LGA which falls into one of the 'risk' categories, those being High Risk, Emerging Risk and Urban Interface Risk. Bottom row shows the amount and % of each habitat type which falls into a risk category, *i.e.* 77% of Primary PKH in Liverpool falls into a risk category.

	Primary	2A	2B	2C	Total
High Risk	174 ha	19 ha	1,199 ha	56 ha	1,448 ha
Emerging Risk	459 ha	52 ha	577 ha	139 ha	1,227 ha
Urban Interface Risk	295 ha	234 ha	665 ha	613 ha	1,807 ha
Total	**928 ha (77%)**	**305 ha (84%)**	**2,441 ha (58%)**	**808 ha (27%)**	**4,482 ha (52%)**

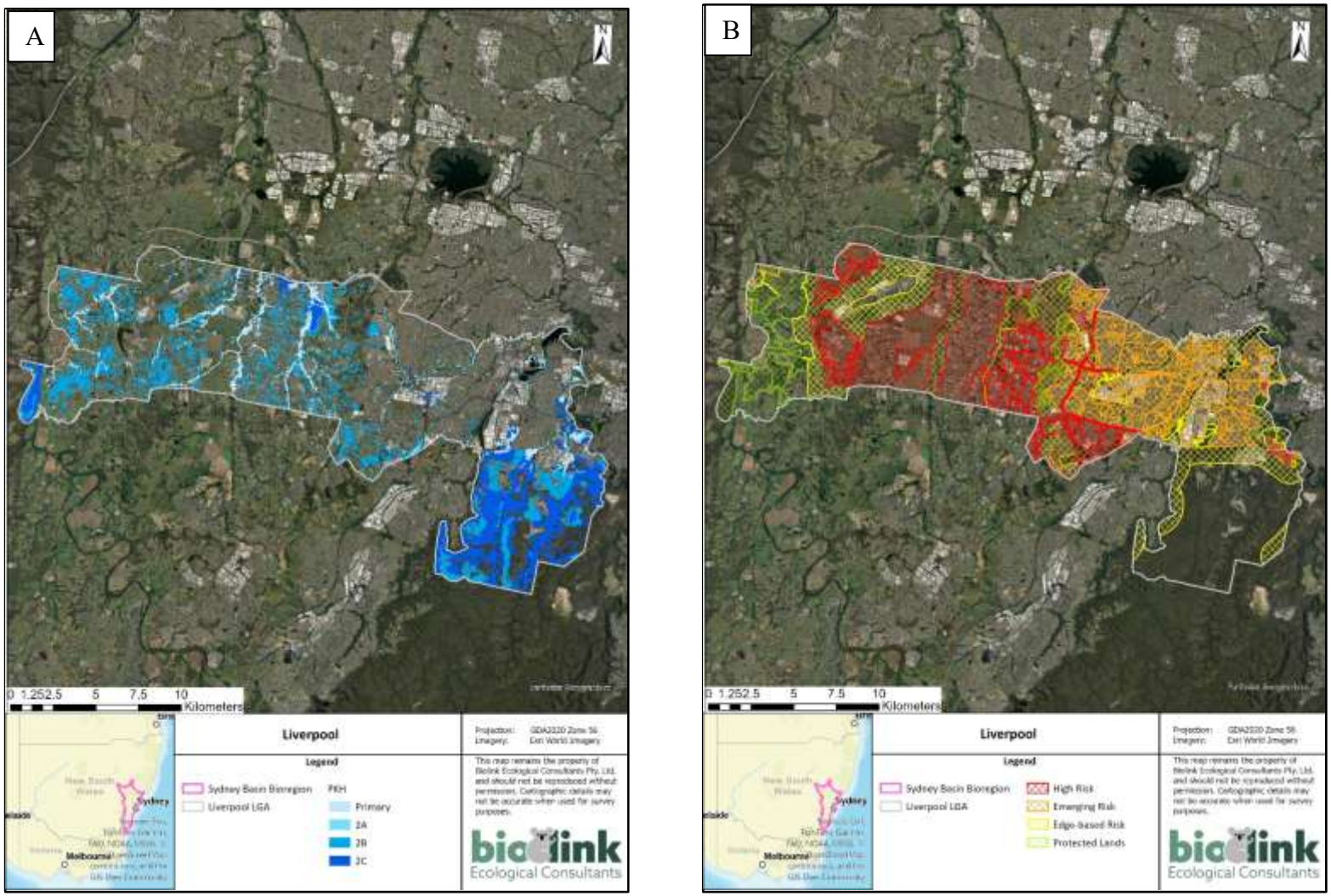


Figure 5. PKH in the Liverpool LGA shown in (**A**) with various shades of blue indicating different potential carrying capacities of habitat. Risk tiers and Protected land overlays across the same area shown in (**B**), with High Risk in red cross-hatch, Emerging Risk in orange cross-hatch, Urban Interface Risk in yellow cross-hatch and Protected lands in green cross-hatch.

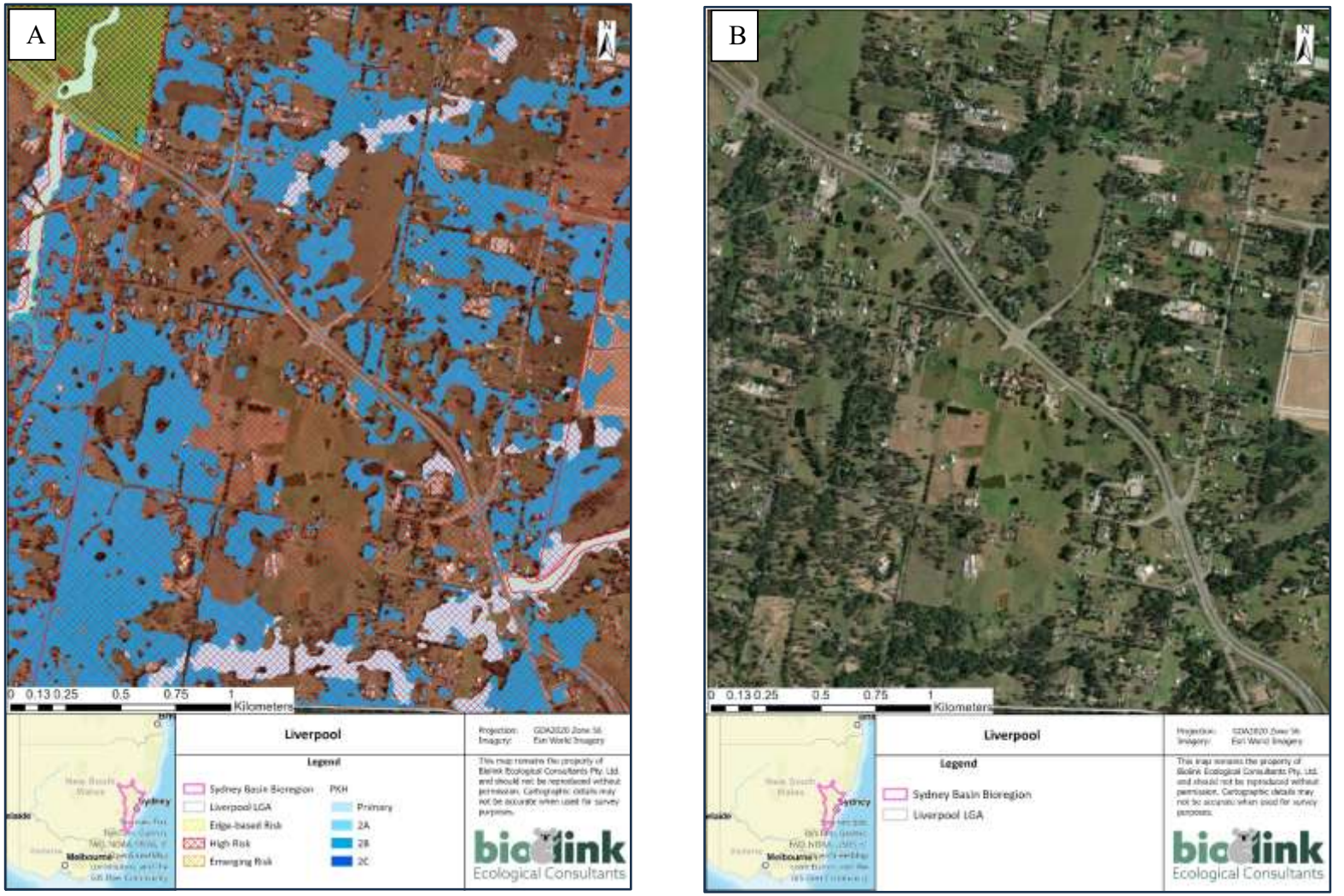


Figure 6: Case study of a section of western Liverpool LGA showing the intersect of PKH (various shades of blue) and High Risk classification (red cross-hatch) where clearing is operationally enabled (**A**). Note that some vegetation has already been cleared since this mapping was produced. The underlying satellite imagery is shown in (**B**), to aid clarity.

Discussion

The purpose of the case study is not to demonstrate that koalas currently occupy this landscape at high density, but rather to illustrate the divide between current planning frameworks and future conservation opportunity.

Most contemporary koala records within Liverpool LGA occur in the east, in association with the Georges River and bushland in and adjoining Holsworthy Military Base. Consequently, occupancy within the western Liverpool landscape is likely to be comparatively low at present, though there are koala sightings records as far west as Badgerys Creek.

Western Liverpool supports mapped koala habitat at the peri-urban interface and the currently negligible koala occupancy does not diminish its conservation significance. Recent analyses indicate that the Liverpool koala population has dramatically expanded its geographic extent over recent decades (Biolink 2024), suggesting that future recovery is likely to depend not only on protecting existing occupied habitat, but also on retaining habitat capable of supporting future colonisation and maintaining landscape connectivity. Note that outside the Holsworthy Military Base, there is very limited koala habitat in the highly urbanised east of the LGA, which may be limiting koala population expansion and movement.

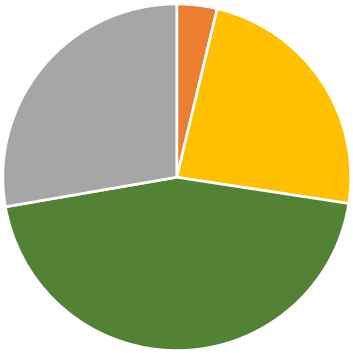
The NSW Koala Strategy has the stated goal of doubling koala numbers by 2050 (DPE 2022). Achieving this objective requires sufficient habitat to accommodate future population growth. Progressive loss of strategically located habitat may therefore constrain long-term recovery, even where current koala occupancy is relatively low. This highlights the importance of considering habitat extent, connectivity and future population dynamics alongside contemporary distribution when evaluating development risk.

3.2.4 Sutherland Focal Area

SUTHERLAND FOCAL AREA
Koala Habitat Risk Summary

Key Findings:

1. Although only a relatively small area (801 ha) of koala habitat falls within a risk category, this represents a substantial proportion of Sutherland's limited mapped habitat
2. Koala habitat around Heathcote Road falls within a risk category while also being strategically important for maintaining connectivity with the expanding south-west Sydney population



- High Risk – 0 ha (0%)
- Emerging Risk – 109 ha (4%)
- Urban Interface Risk – 692 ha (24%)
- Protected lands – 1,310 ha (45%)
- None of the above – 810 ha (28%)

Proportion of koala habitat in a risk category by habitat type:



HABITAT TYPE	AREA (ha)	% IN RISK CATEGORIES	
Primary	10 ha	20%	80%
2A	377 ha	19%	81%
2B	67 ha	7%	93%
2C	2,467 ha	29%	71%
Total	2,921 ha	27%	73%

Total PKH: 2,921 ha

Total in risk categories: 801 ha (27%)

Results

Mapped PKH is relatively restricted across Sutherland, with large portions of the LGA supporting vegetation communities that do not contain PKFTs (**Figure 7a**). In total, 2,921 ha of land in Sutherland (8% of the total land surface area) is mapped as supporting PKH; 10 ha is classified as Primary PKH, 377 ha as 2A, 67 ha as 2B and 2,467 ha as 2C. A further 23,308 ha is classified as 'Other' vegetation (non-PKH).

No areas within Sutherland LGA were identified as being subject to High Risk (Tier 1) development pressure, reflecting the absence of mapped Greenfield Housing Code Areas, State Significant Development sites and other strategic urban growth frameworks captured within the current analysis (**Figure 7b**).

Areas of PKH subject to Emerging Risk (Tier 2) are concentrated between Heathcote and Alfords Point Roads and are generally designated on the basis of LEP zoning associated with Heavy Industry land uses (south of Kurnell) and a mapped Future Residential Growth Area (between Heathcote and Alfords Point Roads), which is a strategic planning layer rather than a statutory planning instrument.

Areas identified as being subject to Urban Interface Risk (Tier 3) broadly mirror the spatial distribution of the Emerging Risk layer and are concentrated adjacent to residentially zoned lands and the aforementioned Future Residential Growth Area.

Although the absolute area of PKH intersecting identified risk categories is comparatively small, proportional exposure remains notable for some habitat classes (**Table 7**). Approximately 20% of mapped Primary PKH occurs within the Emerging Risk category. A larger extent of PKH occurs on land classified as Protected under the methodology adopted in this report, comprising 1,310 ha - 45% of the total.

Case Study: **Figure 8a** illustrates a section of western Sutherland LGA near Heathcote Road, where mapped PKH intersects areas classified as Emerging Risk and Urban Interface Risk. The Emerging Risk designation in this area is associated with a mapped Future Residential Growth Area between Heathcote Road and Alfords Point Road. This indicates government recognition of potential future residential development, rather than statutory approval for urban development.

The case study area occurs within a landscape where mapped koala habitat is relatively sparse and fragmented, but strategically important. It lies near known koala records around Heathcote, Engadine, Woronora and Barden Ridge, and within a broader landscape that may contribute to east-west connectivity between Sutherland and the south-west Sydney koala population. Heathcote Road also represents a major movement barrier and vehicle strike risk, with previous reporting identifying increasing koala vehicle strike along this road during the most recent koala generation (Biolink 2025). This illustrates a planning and connectivity issue rather than a large-area clearing issue. Although the total area of mapped PKH affected is modest, the location of this habitat is important because it occurs in one of the few landscapes where movement between Sutherland, Liverpool, Holsworthy and Campbelltown populations may be maintained or restored.

Table 7. Amount of PKH (in ha) in Sutherland which falls into one of the 'risk' categories, those being High Risk, Emerging Risk and Urban Interface Risk. Bottom row shows the amount and % of each habitat type which falls into a risk category, *i.e.* 20% of Primary PKH in Sutherland falls into a risk category.

	Primary	2A	2B	2C	Total
High Risk	-	-	-	-	-
Emerging Risk	2 ha	44 ha	< 1 ha	63 ha	109 ha
Urban Interface Risk	-	26 ha	5 ha	661 ha	692 ha
Total	**2 ha (20%)**	**70 ha (19%)**	**5 ha (7%)**	**724 ha (29%)**	**801 ha (27%)**

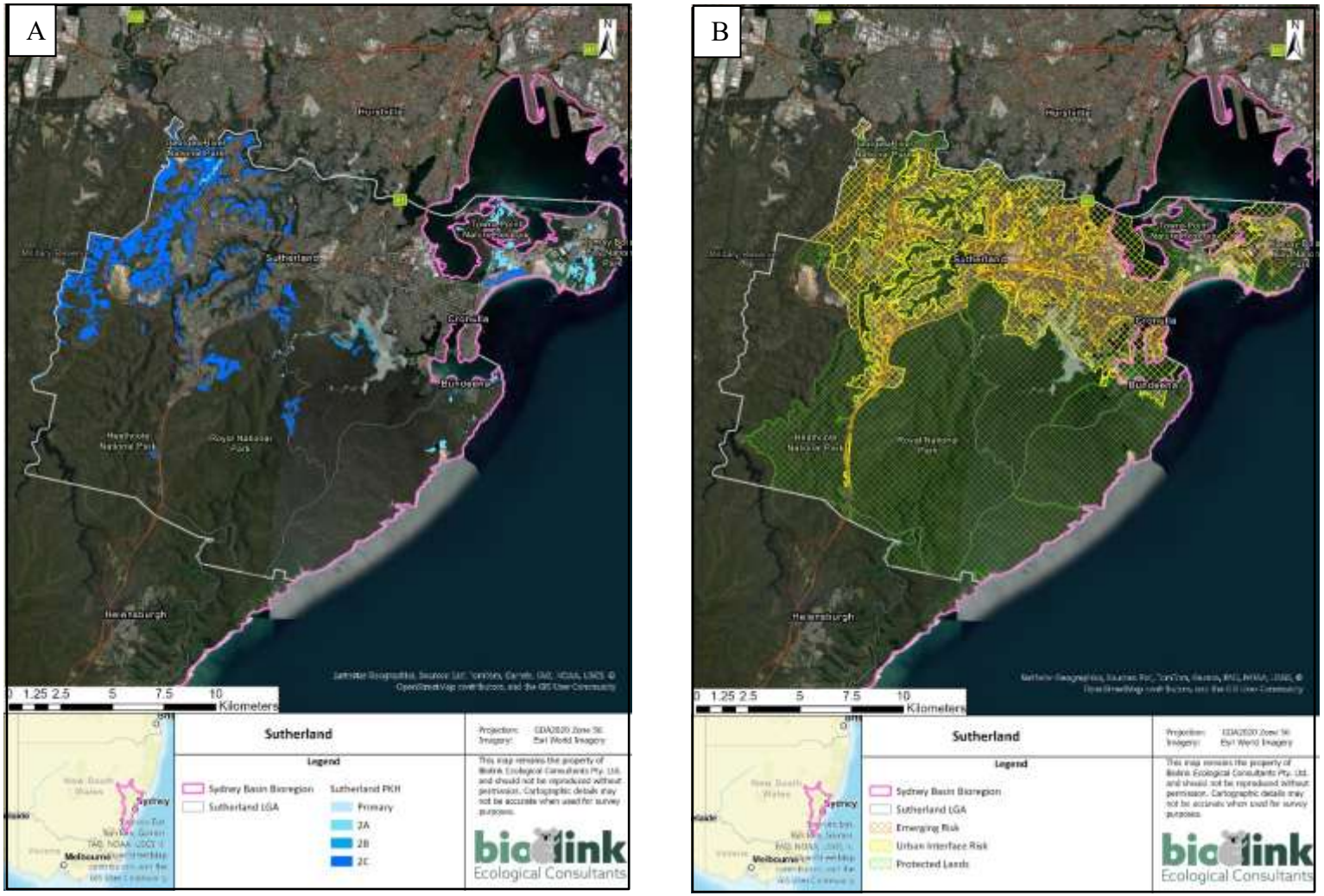


Figure 7. PKH in the Sutherland LGA shown in (**A**) with various shades of blue indicating different potential carrying capacities of habitat. Risk tiers and Protected land overlays across the same area shown in (**B**), with High Risk in red cross-hatch, Emerging Risk in orange cross-hatch, Urban Interface Risk in yellow cross-hatch and Protected lands in green cross-hatch.

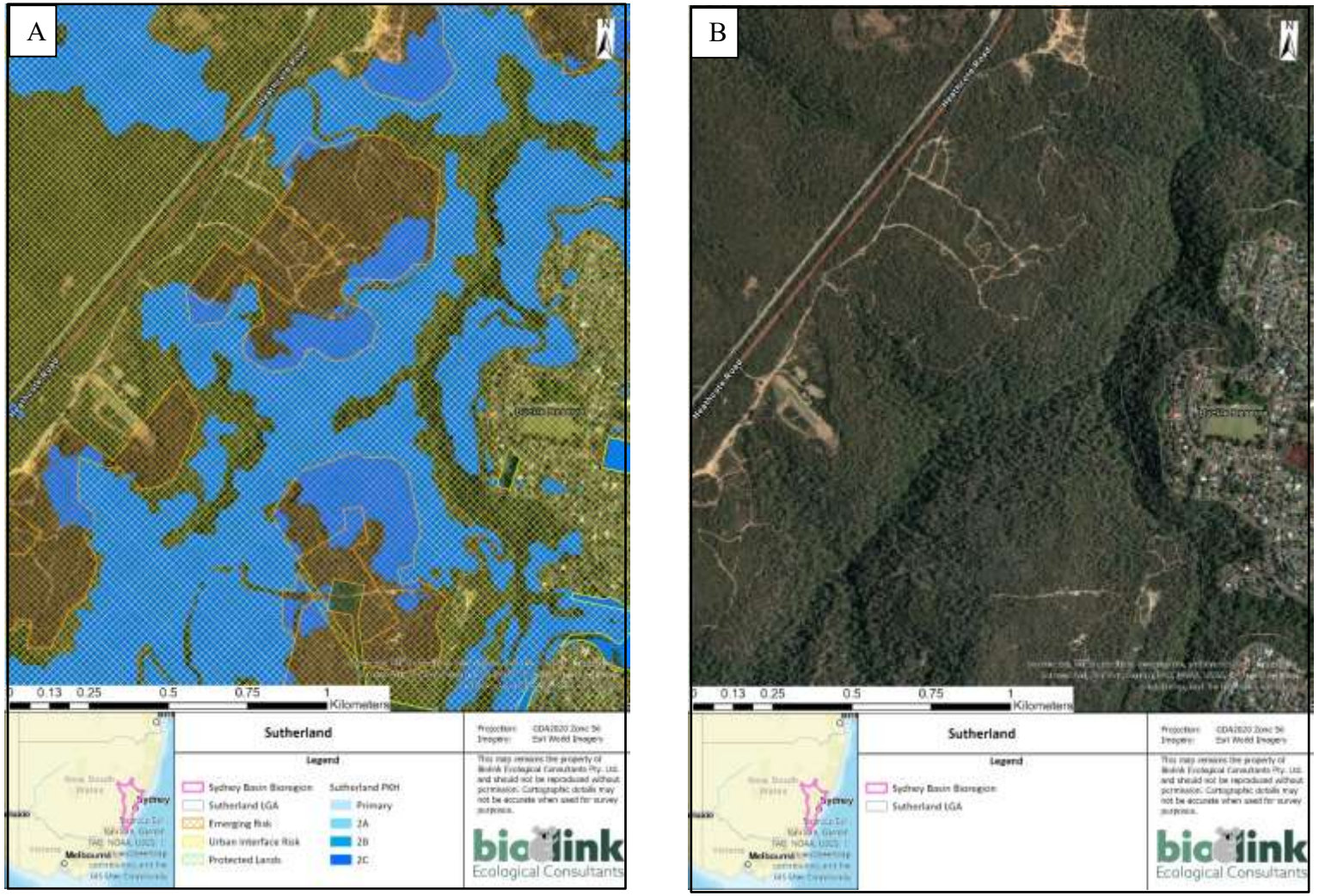


Figure 8: Case study of a section of western Sutherland LGA near Heathcote Rd showing the intersect of PKH (various shades of blue) and Emerging Risk (orange cross-hatch) and Urban Interface Risk (yellow cross-hatch) where there is Government recognition of potential future residential development, but not statutory approval for this development. The underlying satellite imagery of the same area is shown in (**B**), to aid clarity.

Discussion

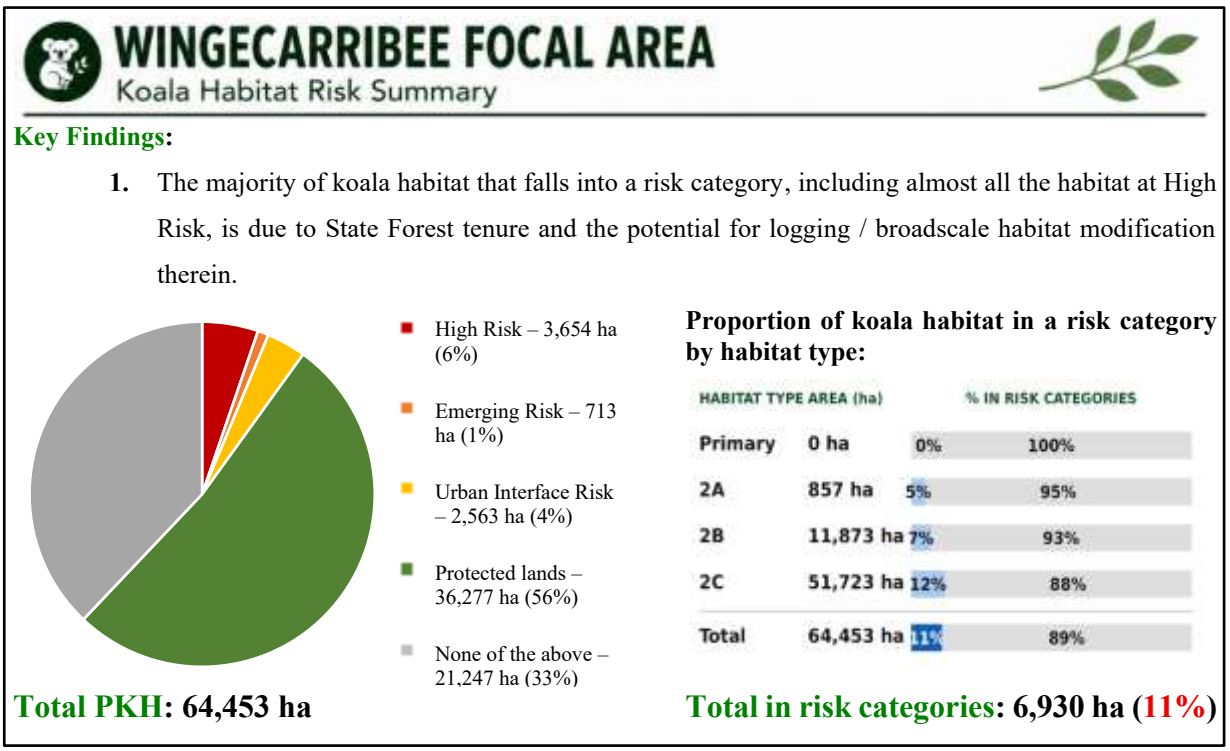
The Sutherland Focal Area differs from several other Focal Areas considered in this report because the absolute area of mapped PKH exposed to identified risk categories is relatively small. However, mapped PKH itself is also limited within Sutherland, accounting for only 8% of the LGA. As a result, even modest additional loss or fragmentation may have disproportionate consequences for local habitat availability, movement and population resilience.

Sutherland's koala records are concentrated in the western and south-western portions of the LGA, including the Heathcote, Woronora, Engadine and Barden Ridge landscapes, and adjoining areas of Heathcote and Royal National Parks. This area is strategically important because it sits between the Sutherland koala population and the broader south-west Sydney koala population centred on Campbelltown, Wollondilly and Liverpool. Recent genetic analysis demonstrates contemporary gene flow between Sutherland koalas and those from Campbelltown / Wollondilly / Liverpool, indicating that these areas form a genetically connected south-west Sydney population (McLennan *et al*. 2025). This reinforces the importance of maintaining functional habitat connectivity and movement pathways between these landscapes.

In this context, Heathcote Road is both a barrier and a management priority. Koala vehicle strike has been repeatedly recorded along Heathcote Road, including in the vicinity of Deadmans Creek and the Woronora River crossing, and previous reporting indicates that vehicle strike has increased along this road over the most recent koala generation (Biolink 2025). Retaining habitat alone will therefore be insufficient if koalas cannot safely move through the landscape.

The Sutherland case study highlights the need to evaluate development pressure in relation to local habitat scarcity and connectivity function, rather than area alone. Where mapped PKH is limited, small areas of habitat may perform important linkage functions, particularly where they connect reserves, riparian corridors and known koala movement routes. Future planning in western Sutherland should therefore prioritise the retention and restoration of habitat around Heathcote Road, Woronora River, Deadmans Creek and adjoining bushland linkages, together with effective road-crossing and vehicle strike mitigation measures.

3.2.5 Wingecarribee Focal Area



Results

Mapped PKH is moderately represented across Wingecarribee LGA, with large portions of the LGA supporting vegetation communities with limited representation of PKFTs (*i.e.* not PKH) (**Figure 9a**). In total, 64,453 ha of land within Wingecarribee (28% of the total land surface area) is mapped as supporting PKH, comprising no Primary habitat, 857 ha of 2A habitat, 11,878 ha of 2B habitat and 51,723 ha of 2C habitat. A further 85,616 ha is classified as 'Other' vegetation (non-PKH).

Wingecarribee LGA contains substantial areas of State Forest tenure, which account for the vast majority of PKH identified as being subject to High Risk (Tier 1) under the current analysis. These include Belanglo, Jellore, Meryla, Penrose, Wingello and Yarrawa State Forests, all of which support varying extents of mapped PKH. Smaller areas of PKH at High Risk occur in association with Greenfield Housing Code Areas near Renwick, Braemar, Bowral and Moss Vale. Only 8 ha of habitat identified as High Risk was associated with urban expansion-related pressure, representing less than 1% of the total habitat within this risk tier (**Figure 9b**).

Areas identified as being subject to Emerging Risk (Tier 2) are concentrated primarily around Colo Vale, Alpine, Mittagong, Bowral, Berrima, Moss Vale, Bundanoon and Wingello, where risk was designated primarily on the basis of residential zoning, with smaller areas identified due to the presence of Future Residential Growth Areas and Urban Release Areas. Areas identified as being subject to Urban Interface Risk (Tier 3) broadly mirror the spatial distribution of Emerging Risk layer.

Overall, a moderate proportion of mapped PKH within Wingecarribee occurs within the identified risk categories (**Table 8**), while larger areas occur on land classified as Protected under the methodology adopted in this report, comprising 36,277 ha - 56% of the total.

In terms of landscape connectivity, portions of the South East and Tablelands Regional Plan Corridors[7] intersect several areas subject to current and future development pressure. Excluding clearing risk associated with State Forest tenure, mapped corridors intersect urban-related risk areas near Hill Top and Colo Vale. More broadly, substantial overlap also occurs between mapped corridors and State Forest lands, indicating overlap between identified connectivity priorities and land uses associated with vegetation disturbance.

Case Study: **Figure 10**a illustrates Belanglo, an operational State Forest managed for timber production. It contains both pine plantation and areas of native forest which include mapped koala habitat identified through the current analysis. Unlike the urban growth landscapes examined elsewhere in this report, the principal source of identified High Risk habitat within Wingecarribee is forestry tenure rather than residential expansion. Belanglo therefore illustrates the broader pattern observed across Wingecarribee where State Forests account for almost all habitat classified as being at High Risk, these landscapes forming part of a broader network of State Forests extending through the Southern Highlands.

Table 8. Amount of PKH (in ha) in Wingecarribee that falls into one of the 'risk' categories, those being High Risk, Emerging Risk and Urban Interface Risk. Bottom row shows the amount and % of each habitat type which falls into a risk category, *i.e.* 5% of 2A PKH in Wingecarribee falls into a risk category.

	Primary	2A	2B	2C	Total
High Risk	-	25 ha	401 ha	3,228 ha	3,654 ha
Emerging Risk	-	1 ha	90 ha	622 ha	713 ha
Urban Interface Risk	-	21 ha	293 ha	2,249 ha	2,563 ha
Total	-	**47 ha (5%)**	**784 ha (7%)**	**6,099 ha (12%)**	**6,930 ha (11%)**

[7] Layer developed by NSW DPE - Regional biodiversity corridor mapping for South East and Tablelands Regional Plan 2036 (updated datasets through 2024)

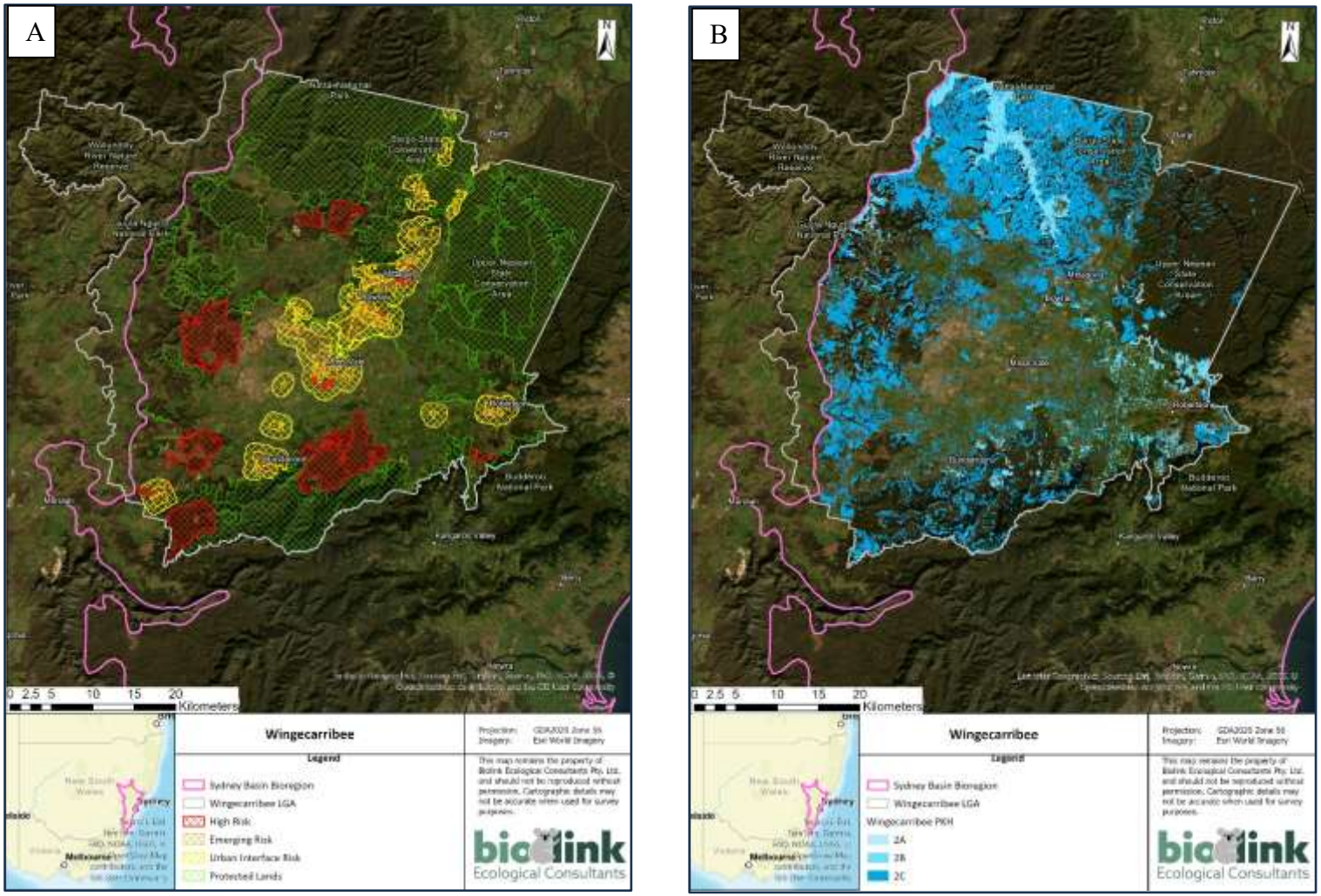


Figure 9. PKH in the Wingecarribee LGA shown in (**A**) with various shades of blue indicating different potential carrying capacities of habitat. Risk tiers and Protected land overlays across the same area shown in (**B**), with High Risk in red cross-hatch, Emerging Risk in orange cross-hatch, Urban Interface Risk in yellow cross-hatch and Protected Lands in green cross-hatch.

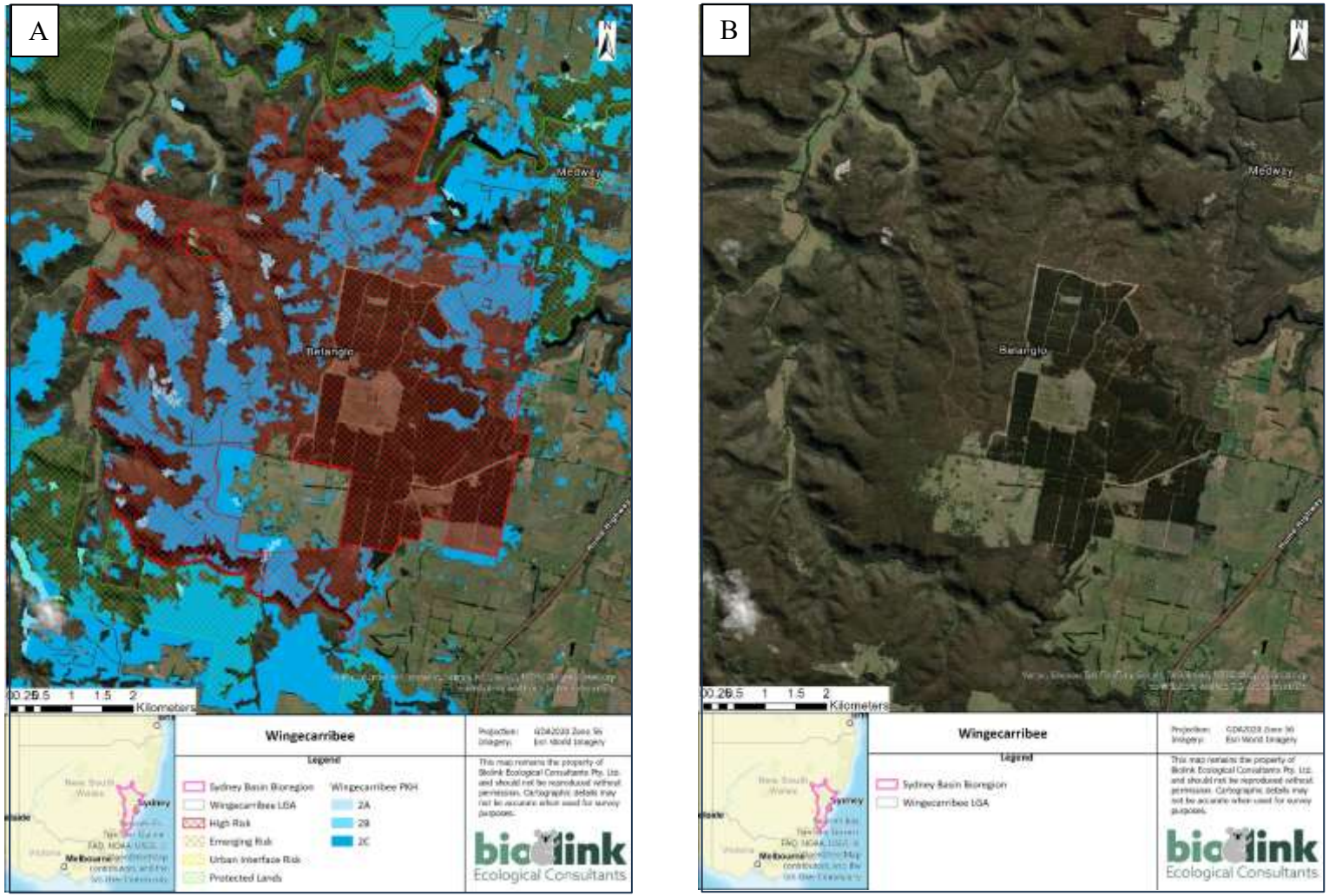


Figure 10: Case study of a section of Wingecarribee LGA, centred on Belanglo State Forest, showing the intersect of PKH (various shades of blue) and High Risk classification (red cross-hatching). The underlying satellite imagery of the same area is shown in (**B**), to aid clarity.

Discussion

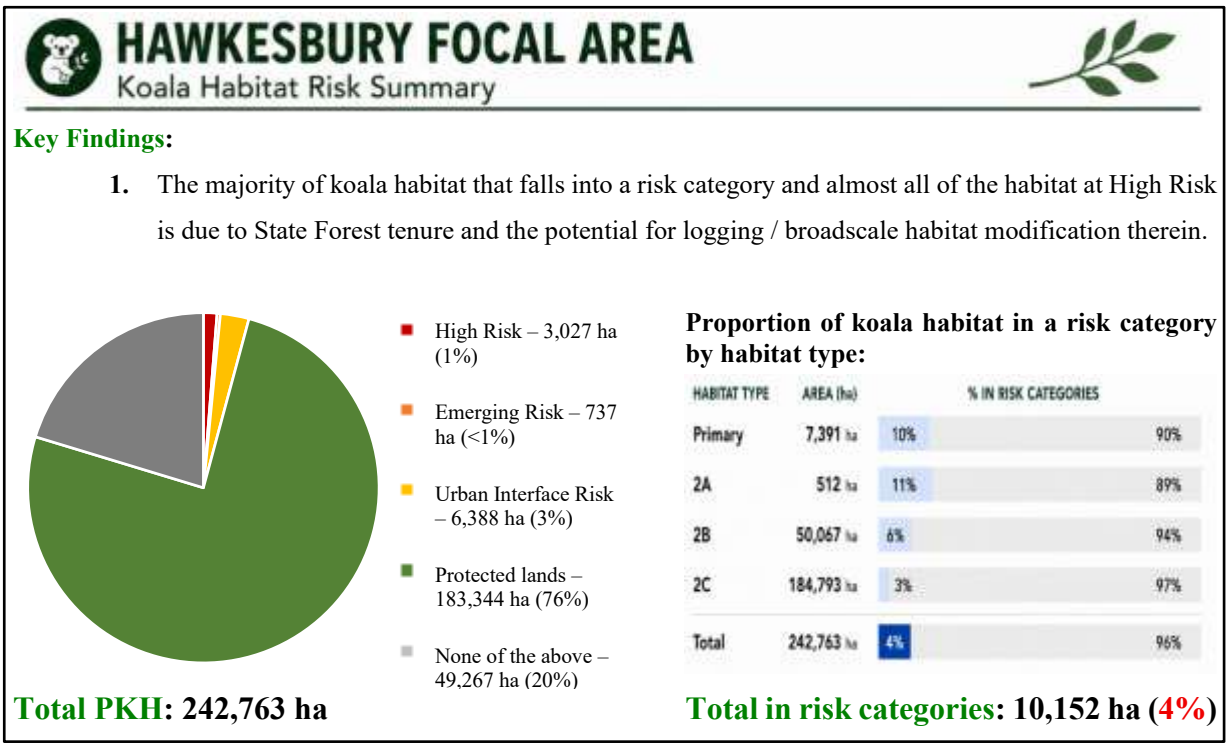
The Wingecarribee Focal Area differs from the preceding Focal Areas because the principal source of identified clearing risk is not urban expansion but native forest harvesting within State Forest tenure. Of the 3,654 ha of PKH classified as High Risk, all but approximately 8 ha occurs within State Forests. This indicates that almost the entirety of High Risk habitat identified in Wingecarribee is associated with forestry operations rather than residential or industrial development.

This finding highlights an important distinction in the types of development pressure operating across the Sydney Basin. In Campbelltown, Liverpool and parts of Sutherland, koala habitat is primarily exposed to urban growth, infrastructure development and associated fragmentation. In contrast, Wingecarribee demonstrates that extensive areas of habitat can also experience disturbance where forestry operations occur across large, contiguous forest landscapes. Although native forest harvesting differs fundamentally from permanent clearing associated with urban development, it nevertheless has the potential to modify forest structure, reduce habitat quality, alter landscape permeability and influence the long-term functioning of movement corridors.

The overlap between State Forest tenure and the South East and Tablelands Regional Plan corridor network further highlights the importance of considering forestry within broader landscape connectivity planning. While these forests remain largely vegetated at this time, repeated harvesting and the conversion of native forest to pine plantation has the potential to influence the structural continuity of habitat across landscapes identified as regionally important for koala movement.

Unlike the urban growth landscapes examined elsewhere in this report, Wingecarribee demonstrates that the principal challenge for koala conservation is not necessarily preventing complete habitat loss, but ensuring that large, connected forest landscapes continue to function as effective habitat and movement pathways under State Forest management.

3.2.6 Hawkesbury Focal Area



Results

The Hawkesbury Focal Area supports extensive areas of mapped PKH (**Figure 11a**). In total, 242,763 ha of land within Hawkesbury LGA (87% of the total land surface area) is mapped as supporting PKH. Of this, 7,391 ha is classified as Primary PKH, 512 ha as 2A, 50,067 ha as 2B and 184,793 ha as 2C. A further 24,496 ha is classified as 'Other' (non-PKH).

Areas identified as being at High Risk (Tier 1) for future clearing are concentrated primarily within the south-eastern portion of the LGA, particularly where Hawkesbury adjoins the Blacktown LGA around Oakville and associated urban expansion fronts. These areas largely intersect land associated with the Greenfield Housing Code Area and Growth Centres Land Certification areas. Additional High Risk areas occur around Glossodia and North Richmond, also associated with Greenfield Housing Code areas. Large areas of PKH classified as being at High Risk are also identified within State Forest tenure near Colo. Indeed, the largest consolidated area of PKH identified as being at High Risk occurs within Comleroy State Forest (**Figure 11b**).

Areas identified as being subject to Emerging Risk (Tier 2) are concentrated around Yarramundi, Glossodia and Berkshire Park, with smaller fragmented areas occurring

throughout the south-eastern portion of the LGA. These areas are primarily identified as being at risk due to current residential zoning patterns.

Areas identified as being subject to Urban Interface Risk (Tier 3) broadly reflect the spatial distribution of the Emerging Risk layers, occurring primarily in the south-eastern portion of the LGA. Urban Interface Risk areas intersect connectivity features derived from the BIO Map Cumberland Subregion corridor dataset, including riparian corridor alignments and Priority Conservation Lands mapping associated with the Cumberland Plain Recovery Plan. These intersections occur primarily around Windsor and Bowen Mountain, although only relatively small areas of mapped PKH are involved.

Overall, a relatively small proportion of Hawkesbury's mapped PKH occurs within the identified risk categories (**Table 9**). In contrast, large areas of PKH within Hawkesbury are in areas classified as Protected Land according to the methodology of this report, comprising 183,344 ha – 76% of the total mapped PKH. Some overlap was identified between mapped risk areas and PKH occurring on Protected Land. In particular, an overlap between an Urban Release Area and C2 (Environmental Conservation) zoning near Glossodia, requiring further clarification regarding the protected status of this habitat.

Despite the concentration of identified risk areas within the south-eastern urban interface, much of the regionally significant corridor network identified within Hawkesbury did not intersect either mapped risk areas or formally protected land.

Case Study: **Figure 12** illustrates part of the south-eastern Hawkesbury LGA around Oakville, where mapped PKH intersects High Risk areas associated with urban expansion. This landscape occurs at the interface between the Hawkesbury LGA and the adjoining Western Sydney growth area, where rural and peri-urban land is undergoing active transition.

Comparison with recent satellite imagery indicates that portions of the mapped PKH within High Risk areas have already been cleared. This demonstrates that the risk classification is not theoretical but corresponds with areas where land use change is already occurring. Although the total proportion of Hawkesbury's PKH affected by identified risk categories is relatively small, the case study illustrates how localised clearing at the south-eastern urban interface may contribute to ongoing fragmentation of habitat and potential movement pathways. The Oakville area therefore provides a useful example of the broader issue identified within Hawkesbury: extensive koala habitat remains across the LGA, much of it protected, but localised

development fronts may still affect strategically important habitat at the interface between the Cumberland Plain and the larger forested landscapes of the Hawkesbury.

Table 9. Amount of PKH (in ha) in Hawkesbury LGA which falls into one of the 'risk' categories, those being High Risk, Emerging Risk and Urban Interface Risk. Bottom row shows the amount and % of each habitat type which falls into a risk category, *i.e.* 10% of Primary PKH in Hawkesbury falls into a risk category.

	Primary	2A	2B	2C	Total
High Risk	2 ha	< 1 ha	223 ha	2,802 ha	3,027 ha
Emerging Risk	142 ha	9 ha	416 ha	170 ha	737 ha
Urban Interface Risk	616 ha	45 ha	2,477 ha	3,250 ha	6,388 ha
Total	**760 ha (10%)**	**54 ha (11%)**	**3,116 ha (6%)**	**6,222 ha (3%)**	**10,152 ha (4%)**

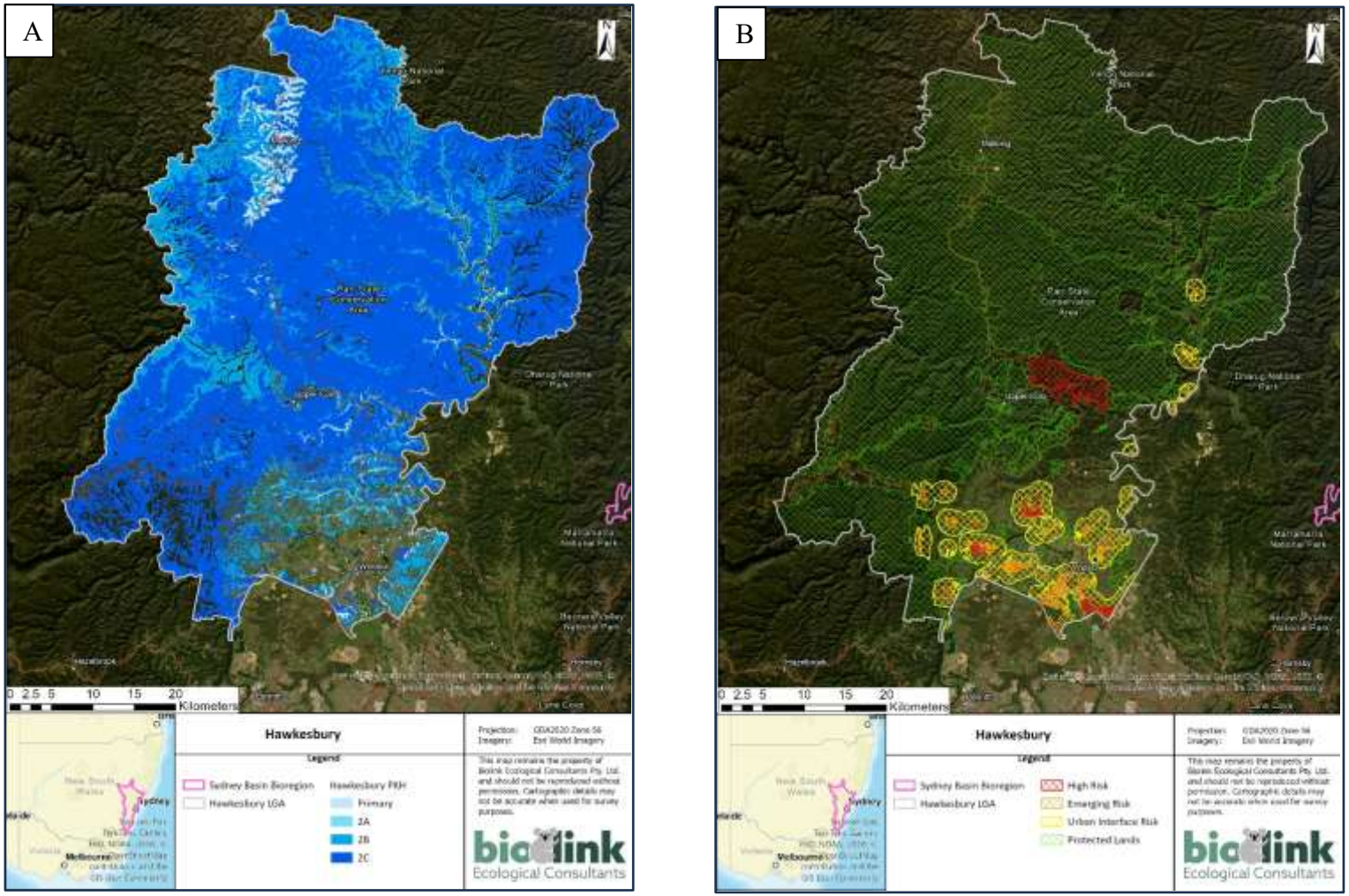


Figure 11. PKH in the Hawkesbury LGA shown in (**A**) with various shades of blue indicating different potential carrying capacities of habitat. Risk tiers and Protected land overlays across the same area shown in (**B**), with High Risk in red cross-hatch, Emerging Risk in orange cross-hatch, Urban Interface Risk in yellow cross-hatch and Protected Lands in green cross-hatch.

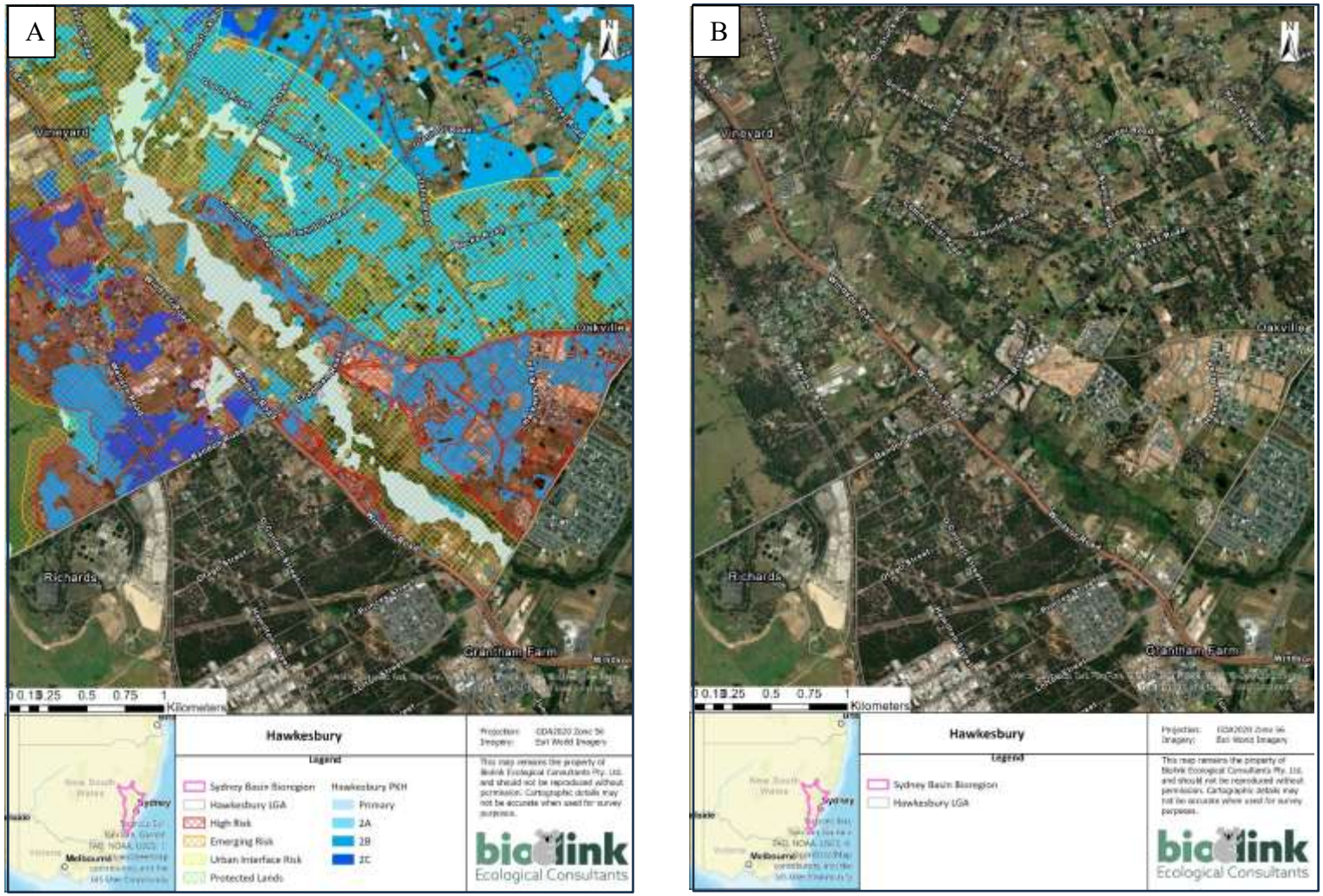


Figure 12: Case study of the far south-east of Hawkesbury LGA, centred on Oakville, showing the intersect of PKH (various shades of blue) and High Risk (red cross-hatching), Emerging Risk (orange cross-hatch) and Urban Interface Risk (yellow-cross-hatch). Note that some vegetation has already been cleared since this mapping was produced (see eastern portion). The underlying satellite imagery of the same area is shown in (**B**), to aid clarity.

Discussion

Across the Hawkesbury Focal Area mapped PKH is both extensive and, in large part, associated with protected landscapes. Approximately 242,763 ha of PKH occurs within Hawkesbury LGA, representing 87% of the total land surface area, and approximately 183,344 ha, or 76%, occurs on land classified as Protected under the methodology adopted in this report. As a result, the proportion of Hawkesbury's mapped PKH exposed to identified risk categories is comparatively low.

However, this does not mean that development pressure is absent or ecologically unimportant. The principal urban-related risk areas occur in the south-eastern portion of the LGA, particularly around Oakville, Glossodia, North Richmond, Yarramundi and Berkshire Park. These areas occur at the interface between the more urbanised Cumberland Plain and the larger forested landscapes of the Hawkesbury. Localised clearing in these locations may therefore have consequences that are disproportionate to its area, particularly where it affects habitat on more fertile landscapes or narrows potential movement pathways between lowland and escarpment habitats.

The Oakville case study illustrates this issue. Although Hawkesbury retains extensive areas of PKH overall, portions of mapped habitat within High Risk areas at the south-eastern urban interface have already been cleared. This demonstrates the importance of considering where clearing occurs, not only how much habitat is affected. Small areas of habitat loss may be significant where they occur within an already fragmented peri-urban landscape or where they influence connectivity between larger habitat blocks.

A second source of High Risk occurs within Comleroy State Forest. This pattern is more similar to Wingecarribee than to the urban growth landscapes of Campbelltown, Liverpool or Sutherland, and reflects the exposure of extensive habitat to forestry-related land management. Hawkesbury therefore contains two distinct forms of risk: localised but potentially high-impact urban expansion in the south-east, and broader forestry-related habitat modification.

The corridor analysis raises an additional issue. Despite the high proportion of protected PKH within Hawkesbury, much of the regionally significant corridor network identified in the LGA does not intersect formally protected land. This suggests that some potential koala movement pathways may fall into a planning gap. Maintaining connectivity across Hawkesbury will therefore require attention not only to protected reserves and identified development fronts, but also to intervening habitat that supports movement between these areas. Overall, Hawkesbury demonstrates that high levels of habitat extent and protection do not remove the need for careful connectivity planning.

3.2.7 Cessnock / Lake Macquarie Focal Area

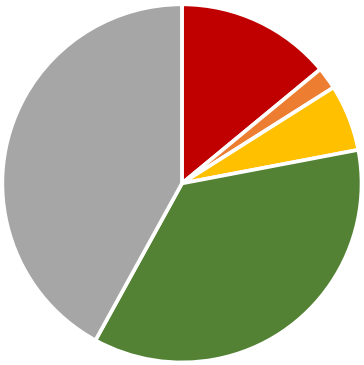
CESSNOCK / LAKE MACQUARIE FOCAL AREA

Koala Habitat Risk Summary

Key Findings:

1. Large, contiguous areas of koala habitat in Lake Macquarie are strategically committed to urban development
2. Cessnock contains the highest proportional coverage by State Forest tenure of any LGA assessed, making forestry the dominant source of High Risk across much of the LGA

CESSNOCK



High Risk – 17,846 ha (14%)

Emerging Risk – 3,022 ha (2%)

Urban Interface Risk – 7,851 ha (6%)

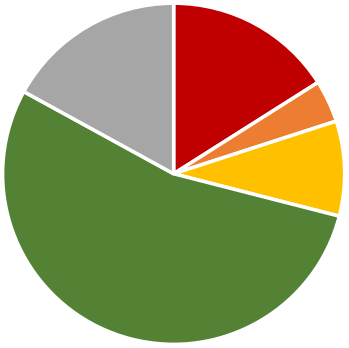
Protected lands – 50,092 ha (38%)

None of the above – 52.143 ha (40%)

Total PKH: 130,954 ha

Total in risk categories: 28,719 ha (22%)

LAKE MACQUARIE



High Risk – 3,411 ha (16%)

Emerging Risk – 924 ha (4%)

Urban Interface Risk – 1,832 ha (9%)

Protected lands – 13,125 ha (63%)

None of the above – 1,623 ha (8%)

Total PKH: 20,917 ha

Total in risk categories: 6,167 ha (29%)

Proportion of koala habitat in a risk category by habitat type:

HABITAT TYPE	AREA (ha)	% IN RISK CATEGORIES	
Primary	1,189 ha	50%	50%
2A	8,835 ha	36%	64%
2B	40,015 ha	20%	80%
2C	80,915 ha	21%	79%
Total	130,954 ha	21%	79%

HABITAT TYPE	AREA (ha)	% IN RISK CATEGORIES	
Primary	1,471 ha	31%	69%
2A	3,318 ha	26%	74%
2B	2,834 ha	30%	70%
2C	13,294 ha	30%	70%
Total	20,917 ha	29%	71%

Results

Mapped PKH is widespread across both the Cessnock and Lake Macquarie LGAs; however, habitat within Lake Macquarie is generally more fragmented and urban-influenced, whereas Cessnock retains larger and more consolidated tracts of contiguous habitat (**Figure 13a**). In total, 130,954 ha of land within Cessnock and 20,917 ha within Lake Macquarie (66% and 28% of their total land surface areas respectively) are mapped as supporting PKH. Mapped PKH differs between the two LGAs in both extent and composition. Within Lake Macquarie, PKH is characterised by a relatively higher proportion of Primary and 2A habitat compared to Cessnock. Collectively, the Cessnock / Lake Macquarie Focal Area supports 2,660 ha of Primary PKH, 12,153 ha of 2A, 42,849 ha of 2B and 94,209 ha of 2C habitat. A further 43,636 ha is classified as 'Other' vegetation (non-PKH).

Areas identified as being subject to High Risk (Tier 1) differ between Cessnock and Lake Macquarie LGAs. Within Cessnock, High Risk is dominated by extensive areas of State Forest tenure, including Pokolbin, Corrabare, Olney, Watagan and Heaton State Forests, with smaller areas associated with Greenfield Housing Code Areas around Nulkaba, Bellbird, Kitchener, North Rothbury, Millfield and Heddon Greta. Cessnock contains the greatest proportional coverage by State Forest tenure of any LGA considered in this report, contributing substantially to the extent of PKH identified as being at High Risk. Within Lake Macquarie, High Risk also occurs within State Forest tenure, particularly Awaba and Olney State Forests, although these forests comprise a smaller proportional component of the LGA; High Risk associated with Greenfield Housing Code Areas play a proportionally larger role within Lake Macquarie than in Cessnock. Greenfield Housing Code areas in Lake Macquarie are concentrated near Edgeworth and Cameron Park, where >200 ha of PKH intersects mapped Greenfield Housing Code land, with smaller areas occurring around Lakelands, Cardiff South, Arcadia Vale, Dora Creek, Cooranbong, Morisset, Wyee Point, Wyee and Bangalay Reserve. Overall, 389 ha of mapped PKH within Cessnock and 265 ha within Lake Macquarie intersect Greenfield Housing Code Areas, mindful that portions of this mapped habitat have already been cleared according to satellite imagery, particularly in Cessnock (**Table 10, Figure 13b**).

Areas identified as being subject to Emerging Risk (Tier 2) also differ between the two LGAs in both extent and underlying land use drivers. Within Cessnock, Emerging Risk areas are concentrated primarily around the urban centres of Cessnock and Kurri Kurri and across the northern portions of the LGA, where risk was designated largely based on Future Residential

Growth Areas and residential, mixed use and industrial zoning. In contrast, Emerging Risk areas within Lake Macquarie are more spatially widespread and are associated primarily with transition zoning and mining-related land uses, with smaller areas identified on the basis of Future Residential Growth Areas.

Several areas of overlap were identified between mapped protected lands and Emerging Risk (Tier 2) layers. Within Cessnock LGA, portions of Tiraki Nature Reserve in the north-west of the LGA intersect land identified as both Future Residential Growth Area and Coal Seam Gas-related planning land uses. Similarly, Heddon Greta Reserve intersects mapped Future Residential Growth Areas. Additional overlap was identified near Paxton, where land zoned for Environmental Conservation (C2) also intersects an Urban Release Area. Comparable patterns occur within Lake Macquarie LGA, including an area east of Olney State Forest and a C2-zoned area near Wyee, both of which also intersect Future Residential Growth Areas. These overlaps indicate instances where conservation-oriented zoning and development-related planning frameworks spatially coincide, although it is unclear from publicly available spatial data whether earlier planning designations remain current, operational or have been superseded by subsequent frameworks.

Areas identified as being subject to Urban-Interface Risk (Tier 3) broadly mirror the spatial distribution of the High Risk urban growth areas and Emerging Risk layers and occurs patchily throughout urban-influenced areas in both LGAs.

The proportion of mapped PKH occurring on lands classified as protected differs between the two LGAs. Approximately 38% of mapped PKH within Cessnock occurs on protected lands, compared with 63% within Lake Macquarie. This difference is particularly pronounced for certain habitat categories, with 57% of Primary PKH and 64% of 2A habitat in Lake Macquarie intersecting protected lands, compared with 10% and 15% respectively within Cessnock. Protected areas in Cessnock are generally more consolidated and contiguous, whereas protected lands within Lake Macquarie are more broadly distributed throughout the LGA but also more fragmented, occurring within a more urbanised landscape and connected by narrower vegetated corridors.

In terms of landscape connectivity, portions of the Cessnock Structural Connectivity Corridors[8] intersect areas identified within the various risk tiers. These corridors include multiple classifications, with both 'vegetated' and 'primary habitat' corridors intersecting mapped risk areas. A substantial proportion of this overlap is associated with State Forest tenure; however, areas of overlap also occur in locations associated with urban expansion and future residential growth.

Case Study: **Figure 14a** illustrates the far north of Lake Macquarie LGA, between Cameron Park and Edgeworth on the LGA boundary. This location contains one of the largest contiguous areas of mapped PKH currently intersecting a Greenfield Housing Code in the Sydney Basin. This land has already been rezoned for urban development and enables complying development, *i.e.* fast-tracked housing approvals. Although Greenfield Housing Code does not prescribe the exact footprint of vegetation clearing within individual development sites, it has been strategically identified for urban development and represents a high level of exposure. In 2025 the NSW government announced plans to fast-track rezoning of the identified native vegetation in the Cameron Park-Edgeworth precinct. This has prompted some organised community opposition regarding the cumulative loss of native bushland associated with urban expansion including potential impacts on koalas and other threatened species.

Comparison with recent satellite imagery indicates that portions of the mapped PKH within High Risk areas have already been cleared (**Figure 14b**).

Table 10. Amount of PKH (in ha) in the Cessnock / Lake Macquarie Focal Area which falls into one of the 'risk' categories, those being High Risk, Emerging Risk and Urban Interface Risk. Bottom row shows the amount and % of each habitat type which falls into a risk category, *i.e.* 50% of Primary PKH in Cessnock falls into a risk category.

		Primary	2A	2B	2C	Total
Cessnock	High Risk	33 ha	188 ha	7,617 ha	10,008 ha	17,846 ha
	Emerging Risk	109 ha	745 ha	140 ha	2,028 ha	3,022 ha
	Urban Interface Risk	450 ha	2,268 ha	429 ha	4,704 ha	7,851 ha
Total		**592 ha (50%)**	**3,201 ha (36%)**	**8,186 ha (20%)**	**16,740 ha (21%)**	**28,719 ha (20%)**
Lake Macquarie	High Risk	21 ha	76 ha	828 ha	2,486 ha	3,411 ha
	Emerging Risk	118 ha	178 ha	< 1 ha	628 ha	924 ha
	Urban Interface Risk	324 ha	610 ha	27 ha	871 ha	1,832 ha
Total		**463 ha (31%)**	**864 ha (26%)**	**855 ha (30%)**	**3,985 ha (30%)**	**6,167 ha (29%)**

[8] Derived by Cessnock City Council in association with DCCEEW for connectivity analysis within Cessnock LGA, associated with local biodiversity / review of LEP (2021-2022)

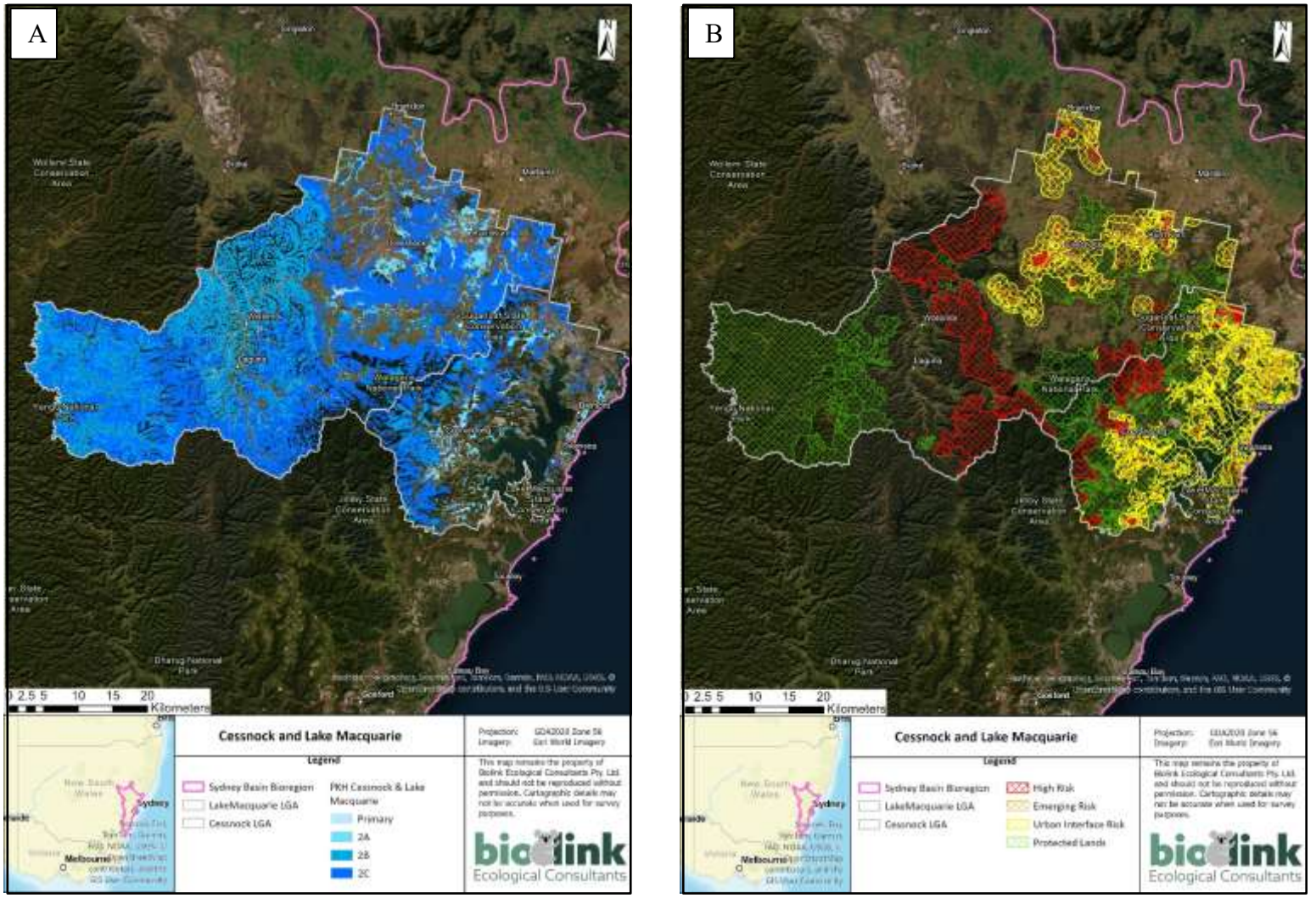


Figure 13. PKH in the Cessnock and Lake Macquarie LGA shown in (**A**) with various shades of blue indicating different potential carrying capacities of habitat. Risk tiers and Protected land overlays across the same area shown in (**B**), with High Risk in red cross-hatch, Emerging Risk in orange cross-hatch, Urban Interface Risk in yellow cross-hatch and Protected Lands in green cross-hatch.

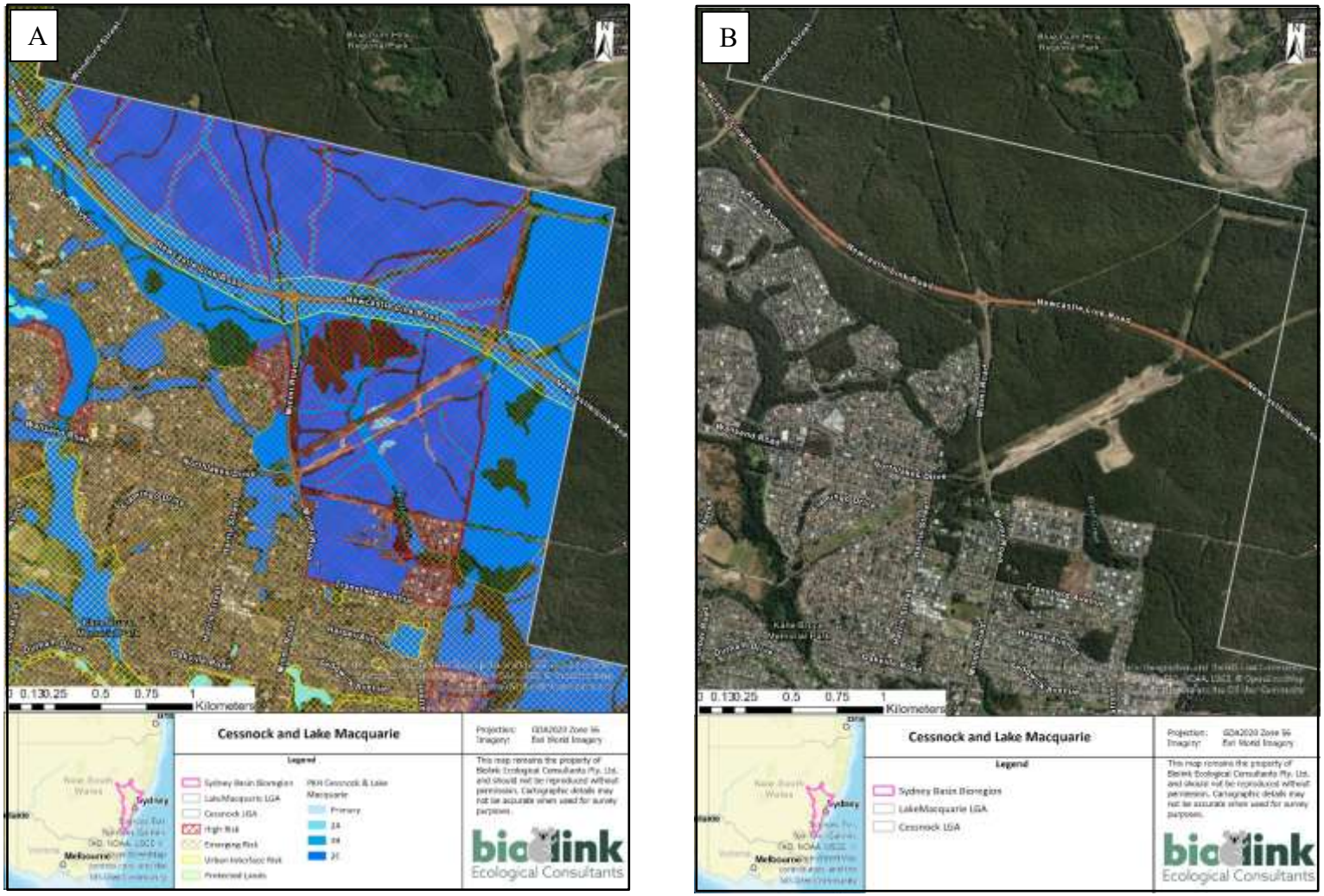


Figure 14: Case study of the far north of Lake Macquarie LGA, centred on the area between Cameron Park and Edgeworth, on the LGA boundary, showing the intersect of PKH (various shades of blue) and High Risk (red cross-hatching), Emerging Risk (orange cross-hatch) and Urban Interface Risk (yellow-cross-hatch). Note that some vegetation has already been cleared since this mapping was produced. The underlying satellite imagery of the same area is shown in (**B**), to aid clarity.

Discussion

Although State Forest tenure accounts for the majority of PKH classified as High Risk within the Cessnock / Lake Macquarie Focal Area, the ecological implications of this risk can differ from those associated with urban development. Native forest harvesting typically retains some forest, albeit in a modified condition, whereas urban expansion generally results in a more permanent and intensive landscape transformation. Consequently, relatively small areas of PKH committed to urban growth may have disproportionately large and irreversible consequences for koala habitat availability, landscape connectivity and long-term carrying capacity.

The analysis also identified multiple instances where conservation-oriented land use frameworks spatially coincide with development planning instruments. These include overlaps between Environmental Conservation (C2) zoning, protected lands and Future Residential Growth Areas or Urban Release Areas within both LGAs. While some of these overlaps may reflect historical planning decisions or superseded planning frameworks, they nevertheless highlight a lack of transparency regarding the long-term status of these lands. Where conservation and development objectives apply to the same landscape, it becomes difficult to determine the degree of protection likely to be afforded to mapped koala habitat and associated movement corridors.

The Cameron Park–Edgeworth case study further demonstrates that large, contiguous areas of mapped PKH can become strategically committed to urban development despite retaining substantial ecological values. This precinct contains one of the largest contiguous areas of mapped PKH intersecting a Greenfield Housing Code within the Sydney Basin. Comparison with recent satellite imagery indicates that vegetation clearing has already commenced in parts of the precinct, demonstrating that these planning frameworks are translating into on-ground habitat loss. This case study also raises a broader strategic question. The NSW Government has committed to doubling koala numbers by 2050; however, achieving this objective will require not only the protection of existing koala populations but also the retention of landscapes capable of supporting future population growth.

3.2.8 Sydney Basin Koala Network – Greater Sydney Corridors

Results

Figure 15 illustrates the Greater Sydney Corridors identified by the Sydney Basin Koala Network and their spatial relationship with the High Risk, Emerging Risk and Urban Interface Risk framework developed in this report. Collectively, these corridors extend from Dharug National Park and Upper Colo region in the north to the Bargo State Conservation Area and Upper Nepean region in the south, encompassing the principal landscapes identified by the Sydney Basin Koala Network as important for maintaining connectivity across Greater Sydney.

The analysis indicates that substantial portions of these corridors intersect one or more of the identified risk categories. Areas of overlap are particularly evident within the south-west Sydney growth corridor, including Liverpool, Campbelltown and Wollondilly and additional areas of overlap occur around existing urban centres throughout the Sydney Basin. While the extent and underlying causes of risk differ between focal areas, the cumulative pattern demonstrates that many of the landscapes identified as important for koala movement are also exposed to ongoing land-use change.

Discussion

The Greater Sydney Corridor network provides a landscape-scale perspective on the findings presented throughout this report. Rather than being confined to isolated development precincts, the analysis demonstrates that current planning frameworks overlap strategically important movement pathways across multiple regions of the Sydney Basin. This suggests that cumulative habitat modification may progressively reduce functional connectivity between regional koala populations, even where individual developments retain portions of native vegetation or avoid areas of currently occupied habitat.

Importantly, the corridors shown in **Figure 15** are intended to facilitate long-term population resilience, rather than simply protecting existing concentrations of koalas. Consequently, maintaining the integrity of these landscapes is likely to become increasingly important if regional koala populations are to expand, adapt to environmental change and remain genetically connected over the long term.

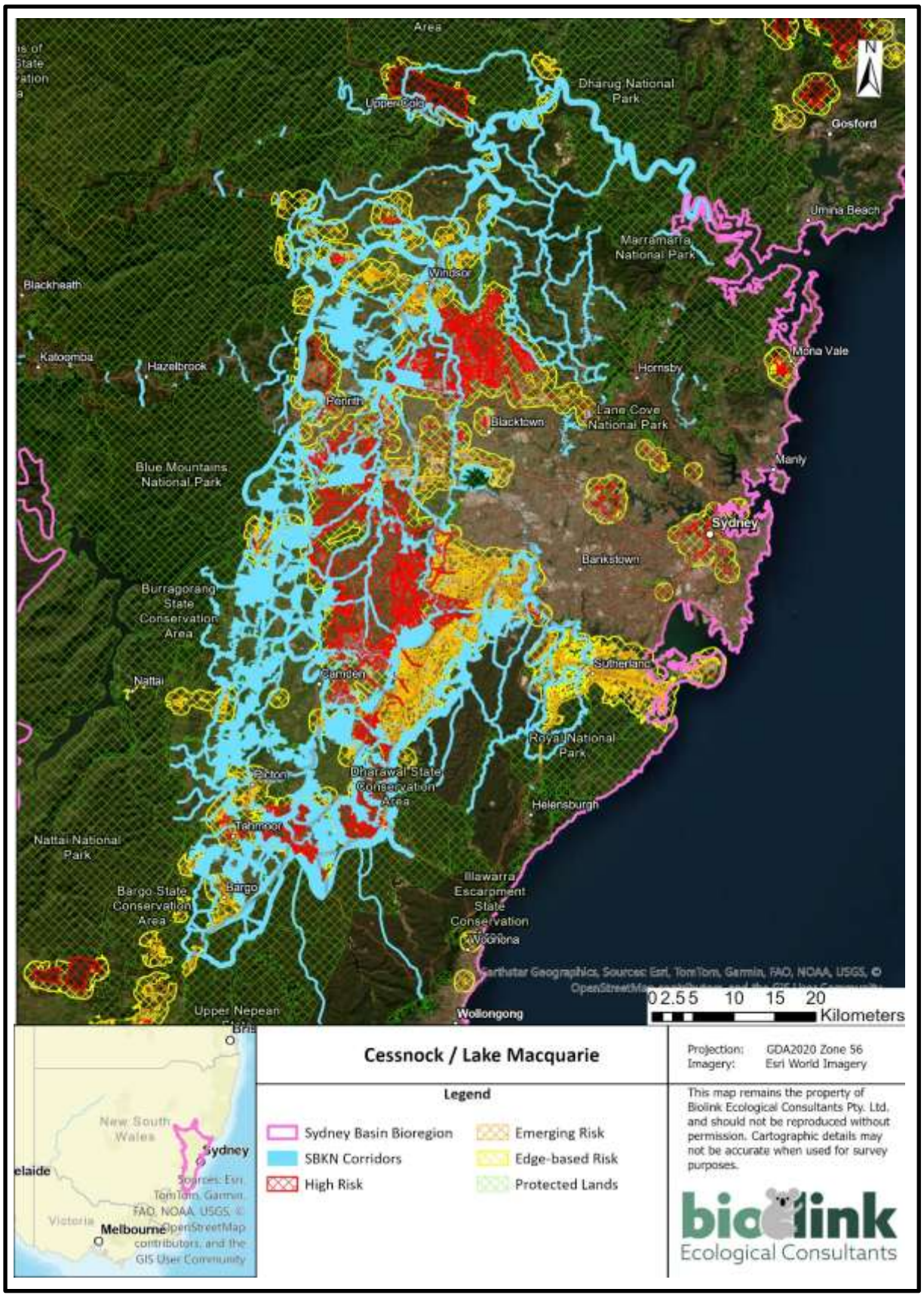


Figure 15. Greater Sydney Corridors (generated by Sydney Basin Koala Network) shown in light blue and High, Emerging and Urban Interface Risk tiers in red, orange and yellow crosshatch respectively, as developed by this report for Focal Areas.

3.4 Discussion

The Sydney Basin Bioregion supports approximately 1.85 million hectares of mapped PKH, representing 51% of the study area. Most comprises Secondary (Class 2C) vegetation associated with the extensive sandstone landscapes that characterise much of the Bioregion, while higher carrying-capacity Primary and Class 2A habitat is comparatively limited and generally confined to the more fertile alluvial and transitional landscapes that have historically been favoured for agriculture and urban development.

The apparent increase in mapped PKH compared with Biolink (2023) reflects revisions to the NSW State Vegetation Type Map rather than ecological change. Differences in vegetation attribution, polygon delineation and mapping resolution mean that the two versions are not directly comparable. No publicly available dataset currently allows consistent measurement of change in PKH extent through time, limiting the ability to determine whether the regional habitat base is increasing, stable or declining.

A key finding is that habitat classes are exposed to different forms of clearing risk. Higher carrying-capacity Primary and Class 2A habitat occurs disproportionately within landscapes identified for urban expansion, reflecting its association with fertile soils and accessible terrain. In contrast, large areas of Class 2C habitat are associated with State Forest tenure and forestry-related disturbance. Urban development generally results in permanent habitat conversion and enduring fragmentation, while forestry modifies habitat structure and landscape permeability within landscapes that remain forested. Both can affect koala habitat and connectivity, but their consequences and management requirements differ.

The analysis also identified repeated overlap between mapped koala corridors and areas subject to current or future clearing risk. Across several Focal Areas, connectivity pathways recognised through government biodiversity strategies, koala plans of management and regional conservation initiatives intersect urban growth areas, infrastructure corridors and forestry operations. This does not demonstrate that all mapped corridors will be lost, but it raises uncertainty about how their long-term functionality will be maintained as land use changes.

Protected habitat also varies considerably between landscapes. Wollondilly and Hawkesbury retain extensive and relatively consolidated protected habitat, whereas protection in more urbanised LGAs is generally fragmented and dependent on narrower corridors and isolated reserves. Several case studies also identified spatial overlap between conservation designations

and development-related planning layers, making the likely long-term status of some habitat difficult to determine from publicly available information. Substantial areas of PKH fall outside both the protected-land framework and the identified risk categories and should not therefore be assumed to be secure.

Collectively, the findings indicate that koala conservation planning within the Sydney Basin has become increasingly effective at identifying habitat and connectivity values, but recognition has not consistently translated into clear long-term protection. The same landscapes may be identified as important for koala movement while also being subject to planning frameworks that facilitate development or vegetation disturbance. This creates a significant challenge for the NSW Government's stated objective of doubling koala numbers by 2050, as population growth requires sufficient habitat, functional connectivity and space for expansion.

The framework developed through this project is intended as a decision-support tool rather than a prediction of future clearing. The identification of habitat within a High, Emerging or Urban Interface Risk category should not be interpreted as indicating that clearing will necessarily occur, nor should habitat outside these categories be assumed to be secure. Rather, the framework identifies landscapes where planning settings indicate an elevated likelihood of current and / or future habitat modification and where cumulative impacts on koala habitat and connectivity warrant closer consideration. The associated geodatabase represents an important project output in its own right and provides a transparent and repeatable framework that can be updated as vegetation mapping, planning instruments and conservation datasets evolve.

This analysis identifies where koala habitat, connectivity priorities and planning frameworks intersect but it cannot determine whether these interactions ultimately result in positive or negative conservation outcomes. That requires consistent information on habitat change, corridor condition and functionality, population trends, mitigation and offset outcomes. These broader questions of conservation accountability form the focus of Part Two of this report.

4. Part Two – Evaluating Conservation Accountability and Planning Outcomes

4.1 Strategic conservation planning versus measurable outcomes

Substantial investment has occurred in koala conservation planning across NSW, including the development of CKPoMs, regional biodiversity and corridor strategies, the NSW Koala Strategy, biodiversity stewardship mechanisms and numerous local and regional conservation initiatives. Collectively, these programs represent a significant investment in identifying, protecting and restoring koala habitat.

The analyses presented in Part 1 of this report demonstrate that considerable progress has been made in identifying landscapes that are important for koala conservation. Strategic planning has also increasingly recognised the importance of maintaining habitat connectivity, particularly within rapidly urbanising landscapes where fragmentation poses an ongoing threat to koala persistence. However, conservation intent and measurable ecological outcome are not equivalent. Despite the scale and complexity of these initiatives, it remains difficult to assess whether conservation outcomes are improving.

The analysis presented in Part 1 demonstrates that many corridor systems and strategically identified koala linkages continue to intersect areas subject to urban expansion, infrastructure development and other forms of land use transition. In several cases, connectivity pathways identified through government-supported conservation planning processes overlap areas associated with Greenfield Housing Code Areas, Urban Release Areas, transport corridors or other development-related planning frameworks.

This issue is particularly relevant in rapidly urbanising landscapes such as south-west Sydney, where major conservation planning initiatives have occurred concurrently with large-scale urban growth and infrastructure expansion. In this region, corridors identified by State and local government overlap areas enabled for urban development around Gilead, Menangle, Appin, Wilton and Liverpool. Comparable conflicts occur around Cameron Park–Edgeworth in Lake Macquarie and within corridor landscapes intersecting State Forest tenure in Wingecarribee, Hawkesbury and Cessnock. These overlaps do not demonstrate that conservation objectives have failed or that all habitat within a development framework will be

cleared. Rather, they highlight the distinction between identifying conservation priorities and demonstrating that those priorities are successfully influencing long-term land use outcomes.

This has direct implications for the NSW Government's objective of doubling koala numbers by 2050. Population recovery requires more than the protection of currently occupied habitat. It also requires sufficient habitat to support future population growth, safe movement between populations and the retention of higher carrying-capacity landscapes. Continued loss or fragmentation of Primary and Class 2A habitat is therefore difficult to reconcile with long-term population expansion unless equivalent ecological capacity is secured, restored and demonstrated elsewhere.

Current reporting often describes expenditure, hectares nominated for protection, trees planted, projects commenced or partnerships established. These are important measures of activity, but they do not necessarily demonstrate that koala carrying capacity, habitat extent, connectivity or population viability have improved. A conservation program cannot be evaluated solely by what was funded or delivered; it must also be assessed against measurable ecological outcomes.

4.2 Key accountability questions and current evidence gaps

A transparent accountability framework for koala conservation should be capable of answering several fundamental questions:

- Is the total extent of koala habitat increasing, stable or declining?
- Is the extent of higher carrying-capacity habitat increasing, stable or declining?
- Are mapped corridors remaining vegetated, permeable and functional?
- Are retained corridors used by koalas and do they facilitate movement and gene flow?
- Are road-crossing structures and other mitigation measures reducing mortality and fragmentation?
- Is restored or offset habitat being established in locations that benefit the populations affected by habitat loss?
- Are koala populations stable, increasing or declining in landscapes undergoing urban growth, infrastructure development or forestry?

- Are conservation investments delivering outcomes additional to those that would have occurred without intervention?

At present, many of these questions cannot be answered consistently at regional scales using publicly available information.

Habitat loss, protection and restoration

There is currently no readily accessible regional account of the amount and type of koala habitat lost each year compared with the amount permanently protected, restored or created. This is particularly important because hectares are not ecologically interchangeable. Loss of Primary habitat cannot be assumed to be compensated by protection or revegetation of an equivalent area of lower carrying-capacity habitat, particularly where restored habitat will take decades to develop suitable food-tree structure.

Spatial transparency is also required. Where habitat is cleared in one population landscape, it should be possible to determine where the corresponding conservation benefit is delivered, what habitat type is being protected or restored, when that benefit is expected to become functional and whether it assists the population affected by the original loss.

Corridor condition and functionality

Corridors are frequently represented as mapped lines or polygons, but their ecological value depends on vegetation condition, width, continuity, food-tree composition, road crossings, fencing and surrounding land use. A corridor may remain visible on a map while becoming functionally compromised by narrowing, incremental clearing, hostile road interfaces or poor-quality entrance and exit habitat.

Mitigation infrastructure also requires outcome-based monitoring. Wildlife crossings should not be judged only by whether they were constructed. Their location, accessibility, fencing design, vegetation connections and actual use by koalas must be assessed. Where structures are poorly connected to habitat, inaccessible because of fencing or tenure constraints, or located where preferred food trees are absent, substantial expenditure may deliver little practical conservation benefit.

Population monitoring

Reliable population monitoring is essential if the objective is to double koala numbers by 2050. However, population estimates are costly, methodologically demanding and difficult to repeat consistently at regional scales. Broad-scale modelled estimates may be useful for State-level reporting but can be unreliable at local scales where habitat quality, detectability and koala distribution are highly heterogeneous.

Monitoring should therefore be matched to clearly defined questions. Repeatable occupancy surveys can identify changes in distribution and persistence; density surveys can estimate population size in selected landscapes; genetic monitoring can assess connectivity and inbreeding; and mortality data can identify changes in vehicle strike, disease and other threats. No single method can answer all questions, and a coordinated monitoring framework is required to distinguish genuine recovery from changes in survey effort, modelling assumptions or data availability.

Transparency and evaluation

Public reporting should distinguish clearly between inputs, outputs and outcomes:

- **Inputs:** expenditure, staff time and funding allocated.
- **Outputs:** projects delivered, land agreements established, crossings constructed and trees planted.
- **Outcomes:** habitat secured and functioning, mortality reduced, corridors used and koala populations stable or increasing.

Without this distinction, it is possible to report substantial conservation activity without demonstrating that the ecological condition of koala populations has improved. The current lack of accessible spatial and monitoring data makes independent assessment difficult and limits public confidence in whether policy commitments are being achieved.

The central accountability issue is therefore not whether conservation action is occurring, but whether existing actions are sufficient to counterbalance continuing habitat loss and fragmentation. Unless habitat change, connectivity and population response are measured together, it will remain difficult to determine whether the NSW Koala Strategy and associated planning mechanisms are placing koala populations on a credible pathway toward recovery.

5. Part Three – Data Limitations and Barriers to Accountability

5.1 Current strength of available datasets

The availability of statewide vegetation mapping, planning datasets and publicly accessible spatial services provides a foundation for regional-scale koala conservation assessment. In particular, the NSW State-Wide Vegetation Type Mapping (SWVT), SEED Portal and NSW Planning Portal allow relatively efficient integration of vegetation, tenure and land use planning information across large spatial extents. These resources have greatly improved the transparency of regional conservation planning and have made analyses such as those presented in this report possible.

Collectively, these datasets allow robust regional assessment of:

- koala habitat extent;
- land tenure;
- current and (short-term) future development pressure;
- overlap between habitat and planning frameworks;
- protected land distribution; and
- potential landscape connectivity pathways.

These datasets therefore provide a strong foundation for identifying where conservation effort should be directed and where planning conflicts are most likely to occur. The increasing availability of spatial planning layers also improves transparency regarding urban growth frameworks, infrastructure planning and conservation zoning relative to earlier planning eras where such information was more difficult to access and integrate spatially.

5.2 Remaining limitations and barriers to accountability

Despite substantial improvements in spatial data availability, major limitations remain in relation to evaluating long-term koala conservation outcomes.

While habitat extent (as a snapshot in time) can be mapped reasonably effectively, substantially less information is available regarding how habitat changes through time. Although vegetation

mapping is updated periodically, revisions to mapping methodology and vegetation attribution complicate direct comparison between successive mapping products. Consequently, it remains difficult to determine whether the total amount of PKH across the Sydney Basin is increasing, stable or declining.

Similarly, current datasets provide relatively strong information regarding the location of mapped habitat corridors but considerably less information regarding their functional condition. Connectivity depends not simply on mapped vegetation, but also on habitat quality, landscape permeability, road mortality, barrier effects and the effectiveness of mitigation infrastructure. These ecological processes remain difficult to evaluate consistently at regional scales.

Planning frameworks also evolve continually through amendments to Local Environmental Plans, regional growth strategies, biodiversity certification processes and infrastructure planning. Legacy planning mechanisms frequently overlap newer conservation initiatives, making interpretation increasingly complex and, in some cases, difficult to resolve using publicly available information alone.

Although biodiversity stewardship agreements, conservation reserves and offset mechanisms collectively contribute to habitat protection, publicly available datasets generally provide limited capacity to evaluate their cumulative effectiveness. While conservation investments are increasingly reported in terms of projects undertaken, funding allocated or hectares secured, considerably less information is available regarding whether these investments have resulted in measurable improvements in habitat condition, landscape connectivity or koala populations.

Likewise, while considerable effort has been invested in constructing fauna crossings, exclusion fencing and other mitigation measures throughout the Sydney Basin, there is presently no coordinated regional framework for evaluating whether these measures collectively maintain functional connectivity for koalas.

The consequence is that strategic conservation planning has advanced more rapidly than conservation accountability.

This report seeks to contribute towards addressing that gap by providing a transparent, repeatable spatial framework that integrates vegetation mapping, planning datasets and connectivity information into a single regional assessment. The associated geodatabase can be

updated as planning instruments, vegetation mapping and conservation datasets evolve, providing a consistent basis for future regional assessments of development pressure affecting koala habitat.

References

Biolink Ecological Consultants (BEC) (2019b). City-Wide Koala Monitoring: Habitat mapping and monitoring program. Report to City of Gold Coast Council by Biolink Ecological Consultants Pty. Ltd. Uki, NSW.

Biolink. Ecological Consultants (BEC) (2023b). Lismore Local Government Area: impact of roadside signage on koala vehicle strike. Report to DPE and Lismore City Council by Biolink Ecological Consultants Pty Ltd.

Biolink Ecological Consultants (BEC) (2022). Northern Rivers Koala Activity Assessment: 2021/2022.

Callaghan J. McAlpine C., Mitchell D., Thompson J., Bowen M., Rhodes J., de Jong C., Domalewski R. and Scott A. (2011). Ranking and mapping koala habitat quality for conservation planning on the basis of indirect evidence of tree-species use: a case study of Noosa Shire, south-eastern Queensland. *Wildlife Research* 38: 89-102.

Cristescu R.H., Banks P.B., Carrick F.N. and Frère C. (2013). Potential 'ecological traps' of restored landscapes: koalas Phascolarctos cinereus re-occupy a rehabilitated mine site. *PLOS ONE* 8(11): e80469.

Cork, S. J., Hume, I. D. & Dawson, T. J. (1983). Digestion and metabolism of a natural foliar diet (Eucalyptus punctata) by an arboreal marsupial, the koala (Phascolarctos cinereus). Journal of Comparative Physiology B, 153: 181–190.

Department of Climate Change, Energy, the Environment and Water (DCCEEW). (2014). Threatened Species Scientific Committee (TSSC). Guidelines for assessing the conservation status of native species according to the *Environmental Protection and Biodiversity Conservation Act 1999* and *Environment Protection and Biodiversity Conservation Regulations 2000*. www.dcceew.gov.au/sites/default/files/documents/tssc-guidelines-assessing-species-2025.pdf

Department of Climate Change, Environment, Energy and Water (DCCEEW). (2022). *National Recovery Plan for the Koala Phascolarctos cinereus*. Commonwealth of Australia.

Department of Climate Change, Energy, the Environment and Water (DCCEEW) (2025). *NSW Koala Strategy 2023-24 Annual Report*. NSW Government, Sydney.

QLD Department of Environment and Science (DES). (2022b). *Koala-Sensitive Design Guideline: a guide to koala-sensitive design for planning and development activities*. Queensland Government. Australia.

NSW Department of Planning and Environment (DPE). (2022). *Considering koalas in planned burns*. DPE, Sydney, NSW.

Dique D.S., Preece H.J., Thompson J. and De Villiers D.L (2004). Determining the distribution and abundance of a regional koala population in south-east Queensland for conservation management. Wildlife Research 31: 109-117.

Faulks J. (1990). A preliminary investigation of the distribution of koalas and their potential habitat in the Tweed Shire and implications for management. Australian Zoologist 27: 1-13.

Friends of the Koala (2024). Annual Report 2023/2024. Friends of the Koala, Lismore, NSW.

Hanski I. (1998). Metapopulation dynamics. Nature 396: 41-49.

Hindell M.A. and Lee A.K. (1987). Habitat use and tree preferences of koalas in a mixed eucalypt forest. Australian Wildlife Research 14: 349-360.

Hundloe T. and Hamilton C. (1997). Koalas and Tourism: an economic evaluation. The Australia Institute, Discussion Paper Number 13, July 1997.

ICC (Ipswich City Council). (2015). Koala Conservation and Habitat Management Plan. Prepared by Ipswich Council.

Kavanagh R.P., Stanton M.A. and Brassil T.E. (2007). Koalas continue to occupy their previous home-ranges after selective logging in Callitris-Eucalypt forest. Wildlife Research 34: 94-107.

Kjeldsen S.R., Zenger K.R., Leigh K.A., Ellis W.A., Tobey J.R., Phalen D., Melzer A., Fitzgibbon S. and Raadsma H.W. (2015). Genome-wide SNP loci reveal novel insights into koala (*Phascolarctos cinereus*) population variability across its range. Conservation Genetics 17: 337-353.

Lee A. and Martin R. (1988). The Koala – a Natural History. University of New South Wales Press, Sydney, Australia.

.

McAlpine C.A., Rhodes J.R., Callaghan J.G., Bowen M.E., Lunney D., Mitchell D.L., Pullar D.V. and Possingham H.P. (2006). The importance of forest area and configuration relative to local habitat factors for conserving forest mammals: a case study of koalas in Queensland, Australia. Biological Conservation 132: 153-165.

McLean N. and Handasyde K. (2006). Sexual maturity, factors affecting the breeding season and breeding in consecutive seasons in populations of overabundant Victorian koalas (*Phascolarctos cinereus*). Australian Journal of Zoology 54: 385-392.

McLennan E.A. Wilmott L., Madden K. and Hogg C.J. (2025). Low genetic diversity and high inbreeding in one of the last chlamydia-free strongholds for New South Wales koalas. *Conservation Genetics* 26: 477 – 489.

Melzer A. and Lamb D. (1996) Habitat utilization by a central Queensland koala colony. In Gordon G. (ed) Koalas – Research for Management. World Koala Research Incorporated, Brisbane, pp 93-101.

Mitchell P. (1990). The home ranges and social activity of koalas – a quantitative analysis pp. 177-187 in Lee A.K., Handasyde K.A. and Sanson G.D. (Eds) Biology of the Koala. Surrey Beatty and Sons, New South Wales.

Moore B.D. and Foley W.J. (2000). A review of feeding and diet selection in koalas (*Phascolarctos cinereus*). Australian Journal of Zoology 48: 317-333.

Moore B.D., Wallis I.R., Wood J.T. and Foley W.J. (2004). Foliar nutrition, site quality and temperature influence foliar chemistry of tallowwood (*Eucalyptus microcorys*). Ecological Monographs 74: 553-568.

Negret P.J., Lunney D. and Rhodes J. (2021). Better managing fires and their impacts for koala conservation. NESP Threatened Species Recovery Hub Project 8.4.5 report. Brisbane, QLD.

Noosa Shire Council (NSC). (2016). Koala Conservation Plan. Noosa Shire Council, Queensland.

Pacifici M., Santini L., DiMarco M., Baisero D., Francucci L., Marasini G.G. Visconi P. and Rondinini C. (2013). Generation length for mammals. Nature Conservation 5:87-94.

Phillips S. (1990). Koalas, the Little Australians we'd all Hate to Lose. Australian Government Publishing Service, Canberra, ACT.

Phillips S. (1999). Habitat utilization by the koala *Phascolarctos cinereus* – towards a new approach for effective management and conservation. PhD. Thesis. School of Resource Science, Southern Cross University.

Phillips S. (2000). Population Trends and the Koala Conservation Debate in Conservation Biology 14(3): 650-659.
Port Stephens Council (PSC). (2002). Port Stephens Council Comprehensive Koala Plan of Management (CKPoM). Prepared by Port Stephens Council with the Australian Koala Foundation.

Phillips S. and Allen C. (2014). Strzelecki Ranges Koala Survey. Report to NSW Office of Environment and Heritage.

Phillips S., Callaghan J. and Thompson V. (2000). The tree species preferences of koalas (*Phascolarctos cinereus*) inhabiting forest and woodland communities on Quaternary deposits in the Port Stephens area, New South Wales. Wildlife Research 27: 1-10.

Phillips S. and Callaghan J. (2000). Tree species preferences of koalas (*Phascolarctos cinereus*) in the Campbelltown area south-west of Sydney, New South Wales. Wildlife Research 27: 509-516.

Phillips S. and Callaghan J. (2011). The Spot Assessment Technique: a tool for determining localised levels of habitat use by koalas Phascolarctos cinereus. Australian Zoologist 35: 774-780.

Phillips S. and Wallis K. (2016). Koala Likelihood Mapping – Baseline Koala Survey Analysis and Reporting. Final Report to NSW Environment Protection Authority, NSW.

Reed P.C., Lunney D. and Walker P. (1990). A 1986-1987 survey of the koala Phascolarctos cinereus (Goldfuss) in New South Wales and an ecological interpretation of its distribution. In A.K. Lee, K.A. Handasyde and G.D. Sanson (Eds) Biology of the Koala (pp 55-74). Surrey Beatty and Sons, Sydney, Australia.

Reiss A., Hobbs E. and Vitali S. (2025) National guidance for vaccination of koalas against chlamydia. Wildlife Health Australia, Sydney.

Stalenberg E., Wallis I.R., Cunningham R.B., Allen C. and Foley W.J. (2014). Nutritional correlates of koala persistence in a low-density population. PLOS ONE 9: e113930.

Sluiter A.F., Close R.L. and Ward S.J. (2001). Koala feeding and roosting trees in the Campbelltown area of New South Wales. Australian Mammalogy 23: 173-175.

Threatened Species Scientific Committee (TSSC) (2012). *Listing advice for Phascolarctos cinereus (Koala)*. Available from http://www.environment.gov.au/biodiversity/threatened/species/pubs/197-listing-advice.pdf.

Threatened Species Scientific Committee (TSSC) (2021). *Conservation Advice – Phascolarctos cinereus (Koala)*. Department of Agriculture, Water and the Environment (DAWE), Canberra.

Van Dyck S. and Strahan R. (Eds). (2008). The mammals of Australia (3rd ed.). New Holland Publishers. Sydney, NSW, Australia.

Vitali S.D., Reiss A.E. Jakob-Hoff R.M., Stephenson T.L., Holz P.H. and Higgins D.P. (2023). National Koala Disease Risk Analysis Report version 1.2. University of Sydney, NSW.

Wallis K., Lane A., Phillips S. (2025 - in press). Using species relevant timeframes to partition, prioritise and monitor vehicle-strike blackspots: a case study using the koala *Phascolarctos cinereus* in Lismore, New South Wales. *Australian Zoologist*.

White N.A. (1999). Ecology of the koala (*Phascolarctos cinereus*) in rural south-east Queensland, Australia. Wildlife Research 26: 731-744.

WCUSSC. (1994). IUCN red list categories. World Conservation Union Species Survival Commission (WCUSSC) Gland, Switzerland.

Appendix A

Plant Community Types (PCTs) identified as Preferred Koala Habitat (PKH) within the study area (Sydney Basin Bioregion), including associated PKH category and primary and secondary Preferred Koala Food Trees (PKFTs) present in each PCT. Some PCT descriptions state that a PKFT species is only sometimes present in the canopy. In these cases, the PCT is coded as *e.g.* 'Other / 2C'. These hybrid categories were retained in the underlying dataset but consolidated into their higher-order PKH category (*e.g.* 2C/Other displayed as 2C) for ease of visualisation and summary reporting.

PCT Code	PCT Name	PKH Category	Primary_PKFT	Secondary_PKFT
281	Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion	2B	E. camuldulensis	E. blakelyi, E. melliodora, E. albens
440	Red Stringybark - Narrow-leaved Ironbark - Black Cypress Pine - hill red gum sandstone woodland of southern NSW Brigalow Belt South Bioregion	2A/2C	E. dwyeri	E. dealbata
461	Tumbledown Gum woodland on hills in the northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion	2B		E. dealbata
476	Narrow-leaved Wattle low open forest / very tall shrubland on ridges in northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion	2C		E. dealbata, E. albens
479	Narrow-leaved Ironbark- Black Cypress Pine - stringybark +/- Grey Gum +/- Narrow-leaved Wattle shrubby open forest on sandstone hills in the southern Brigalow Belt South Bioregion and Sydney Basin Bioregion	2A/2C	E. dwyeri	E. punctata
492	Silvertop Stringybark - Yellow Box - Apple Box - Rough-barked Apple shrub grass open forest mainly on southern slopes of the Liverpool Range, Brigalow Belt South Bioregion	2B		E. melliodora
1304	White Box - Narrow-leaved Ironbark grassy woodland of the Capertee Valley, Sydney Basin Bioregion	2B		E. albens
1330	Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion	2B		E. blakelyi, E. melliodora
1610	White Box - Black Cypress Pine shrubby woodland on the Western Slopes	2B		E. albens
1669	Red Ironbark - Grey Gum - Narrow-leaved Stringybark - Brown Bloodwood shrubby open forest on sandstone ranges of the Sydney Basin	2C		E. punctata
1693	Yellow Box - Rough-barked Apple grassy woodland of the upper Hunter and Liverpool Plains	2B		E. melliodora
1853	Blue Mountains Gorges Grey Gum Sheltered Forest	2B		E. punctata
1860	Growee Ranges Grey Gum-Scribbly Gum Forest	2B		

PCT Code	PCT Name	PKH Category	Primary_PKFT	Secondary_PKFT
1878	Capertee Escarpment Slaty Gum Forest	Primary	E. glaucina	
1886	Western Hunter Footslopes Box Woodland	2A		E. melliodora
1889	Cudgegong Footslopes Yellow Box Forest	2A		E. melliodora
3074	Hunter Coast Lowland Grey Myrtle Wet Forest	2C		E. punctata, E. microcorys
3077	Illawarra Complex Dry Rainforest	2C/Other		E. tereticornis
3078	Illawarra Lowland Wet Vine Forest	Primary	E. tereticornis	
3082	Western Sydney Complex Dry Rainforest	2C/Other		E. tereticornis
3084	Lower North Choricarpia Wet Forest	2C/Other		E. propinqua
3089	Lower North Waterhousea Riparian Rainforest	2C/Other		E. propinqua, E. microcorys
3110	Greater Sydney Enriched Grey Myrtle Dry Rainforest	2C		E. tereticornis
3111	Sydney Hinterland Grey Myrtle Riparian Forest	2C		E. punctata
3114	Upper Hunter Ranges Moist Gully Forest	2C/Other		E. punctata
3115	Western Hunter Sandstone Grey Gum-Grey Myrtle Forest	2B		E. punctata
3119	Upper Hunter White Box Vine Thicket	2B		E. albens
3136	Blue Gum High Forest	2C/Other		E. punctata
3137	Blue Mountains Enriched Blue Gum Moist Forest	2C		E. punctata
3138	Blue Mountains Wet Gully Forest	2C		E. cypellocarpa
3141	Central Coast Dolerite Hills Wet Forest	2B		E. tereticornis
3166	Northern Escarpment Brush Box-Tallowwood-Maple Wet Forest	2B		E. microcorys
3169	Northern Hinterland Tallowwood-Brush Box Wet Forest	2B		E. microcorys, E. propinqua
3171	Northern Lowland Viney Wet Forest	2A	E. microcorys	
3185	Far South Riverflat Wet Forest	2B		E. cypellocarpa
3193	South Coast Stringybark -Monkey Gum Wet Forest	2B		E. cypellocarpa
3201	Mid North Escarpment Blue Gum Moist Forest	2C		E. microcorys
3209	Blue Mountains Basalt Cap Forest	2C		E. cypellocarpa
3210	Blue Mountains Cool Wet Eucalypt Forest	2C/Other		E. cypellocarpa
3213	Illawarra Southern Escarpment Wet Forest	2C/Other		E. cypellocarpa
3219	Southeast Mountain Wet Fern Forest	2B		E. cypellocarpa
3221	Southern Escarpment Mesmate Forest	2B		E. cyperllocarpa

PCT Code	PCT Name	PKH Category	Primary_PKFT	Secondary_PKFT
3223	Southern Highlands Shale-Basalt Wet Forest	2B		E. cypellocarpa
3224	Southern Highlands Swamp Forest	2B		E. cypellocarpa
3225	Western Blue Mountains Colluvial Apple Forest	2C		E. cypellocarpa
3226	Western Blue Mountains montane Wet Fern Forest	2C		E. cypellocarpa
3227	Western Blue Mountains Sheltered Shale Forest	2B		E. cypellocarpa
3235	Hunter Escarpment Enriched Moist Forest	2C		E. tereticornis, E. punctata
3236	Hunter Valley Hills Wet Vine Forest	2C		E. punctata
3237	Hunter Range Blue Gum Gully	2C		E. punctata
3238	Hunter Range Colluvial Apple-Gum Forest	2C		E. punctata, E. tereticornis
3239	Hunter Range Sheltered Grey Gum Forest	2B		E. punctata
3240	Lower North Escarpment Red Gum Grassy Forest	2B		E. blakelyi, E. tereticornis, E. canaliculata, E. biturbinata
3241	Lower North White Mahogany-Spotted Gum Moist Forest	2C		E. microcorys, E. propinqua, E. punctata
3242	Lower North Ranges Turpentine Moist Forest	2C		E. microcorys, E. propinqua, E. punctata
3244	Lower North Spotted Gum-Mahogany-Ironbark Sheltered Forest	2C		E. propinqua, E. punctata, E. cannaliculata, E. microcorys
3249	Northern Bloodwood-Ironbark Moist Grassy Forest	2C		E. propinqua, E. microcorys, E. tereticornis
3250	Northern Foothills Blackbutt Grassy Forest	2B		E. microcorys, E. propinqua
3251	Northern Gorges Diverse Grassy Forest	2C		E. microcorys, E. propinqua, E. tereticornis, E. biturbinata
3252	Northern Hinterland Grey Gum-Mahogany Grassy Forest	2B		E. propinqua, E. microcorys, E. tereticornis
3253	Northern Hinterland Grey Gum-Turpentine Mesic Forest	2B		E. microcorys
3260	Sydney Foreshores Shale Forest	2B		E. punctata, E. tereticornis
3261	Sydney Sandstone Plateau Shale Forest	2C/Other		E. punctata
3262	Sydney Turpentine Ironbark Forest	2C		E. punctata

PCT Code	PCT Name	PKH Category	Primary_PKFT	Secondary_PKFT
3263	Watagan Range Turpentine-Mahogany Grassy Forest	2C		E. propinqua, E. punctata
3264	Wollemi Basalt Red Gum Forest	Primary	E. tereticornis	E. melliodora
3266	Nattai-Morton Sandstone Peppermint Gully Forest	2C		E. cypellocarpa
3269	Shoalhaven Lowland Spotted Gum-Paperbark Forest	2B		E. longifolia
3272	South Coast Lowland Creekflat Forest	2A	E. tereticornis	E. longifolia
3273	South Coast Lowland Shrub-Grass Forest	2C		E. longilfolia, E. punctata
3274	South Coast Spotted Gum Moist Forest	2C/Other		E. longilfolia
3275	South Coast Spotted Gum Cycad Dry Forest	2C/Other		E. longilfolia
3276	South Coast Stringybark Cycad Exposed Forest	2C		E. longilfolia
3282	Liverpool Range Apple Gully Forest	2C		E. melliodora, E. blakelyi
3284	Liverpool Range Ribbon Gum-Stringybark Forest	2C/Other		E. melliodora
3285	Lower North Escarpment Blue Gum Grassy Forest	2C/Other		E. caniliculata
3299	Nullo Mountain Basalt Stringybark Forest	2C		E. cypellocarpa
3302	Southern Highlands Shale-Basalt Dry Forest	2C		E. cypellocarpa
3303	Central Tableland Ribbon Gum Sheltered Forest	2C/Other		E. melliodora
3311	Southeast Escarpment Ash Forest	2C/Other		E. cypellocarpa
3313	Araluen Scarp Grassy Forest	2B		E. tereticornis, E. melliodora
3315	Central Hunter Ironbark-Spotted Gum Forest	2C		E. tereticornis
3318	Cumberland Moist Shale Woodland	2B		E. tereticornis
3319	Cumberland Shale Hills Woodland	2B		E. tereticornis
3320	Cumberland Shale Plains Woodland	2B		E. tereticornis
3321	Cumberland Shale-Sandstaone Ironbark Forest	2C		E. punctata
3327	Illawarra Lowland Red Gum Grassy Forest	2B		E. tereticornis
3328	Lower Hunter Red Gum-Paperbark Riverflat Forest	Primary	E. tereticornis	E. caniliculata, E. punctata
3329	Northern Hinterland Valleys Red Gum Grassy Forest	2B		E. tereticornis
3330	South Coast Lowland Woollybutt Grassy Forest	2A	E. tereticornis	E. longifolia
3331	Southeast Gorge Dry Forest	2C/Other		E. tereticornis
3334	Western Hunter Flats Red Gum Sedge Forest	2A	E. tereticornis	E. blakelyi

PCT Code	PCT Name	PKH Category	Primary_PKFT	Secondary_PKFT
3336	Hunter Range Basalt Peaks Red Gum-Velvet Wattle Forest	2B		E. tereticornis
3344	New England Ribbon Gum Grassy Forest	2C		E. melliodora, E. blakelyi
3348	Southern Tableland Granites Ribbon Gum Grassy Forest	2C/Other		E. melliodora
3354	Liverpool Range Box-Silvertop Stringybark Forest	2B		E. melliodora, E. albens
3367	Central Tableland Granites Grassy Box Woodland	2C		E. melliodora
3369	Central Tableland Ranges Peppermint-Gum Grassy Forest	2C		E. melliodora
3373	Goulburn Tableland Box-Gum Grassy Forest	2A		E. melliodora, E. blakelyi
3376	Southern Tableland Grassy Box Woodland	2B		E. melliodora, E. blakelyi
3387	Central West Creekflat Grassy Woodland	2B		E. melliodora, E. blakelyi
3388	Central West Valleys White Box Forest	2B		E. albens
3391	Munghorn Seepage Wet Herbfield	2B		
3395	Northwest Elevanted White Box Woodland	2B		E. albens, E. blakelyi, E. melliodora
3396	Northwest Flats Box-Blakelys Red Gum Forest	2B		E. melliodora, E. albens, E. blakelyi
3397	Northwest Flats Yellow Box Woodland	2B		E. melliodora, E. blakelyi
3398	Northwest Slopes Box-Apple Woodland	2B		E. melliodora, E. albens, E. blakelyi
3401	Upper Hunter Sheltered Viney Shrub Forest	2C/Other		E. albens, E. blakelyi
3402	Western Blue Mountains White Box Forest	2B		E. albens, E. punctata, E. melliodora
3403	Western Hunter Creekflat Apple Grassy Forest	2C		E. blakelyi, E. albens, E. melliodora
3404	Central West Flats Grassy Box Forest	2B		E. conica, E. melliodora
3405	Central West Flats Inland Grey Box Grassy Forest	2C/Other		E. conica
3406	Southwest Ranges White Box Woodland	2B		E. albens, E. melliodora, E. blakelyi
3432	Hunter Coast Foothills Apple-Ironbark Grassy Forest	2C/Other		E. punctata
3433	Hunter Coast Foothills Spotted Gum-Ironbark Forest	2C/Other		E. punctata
3435	Hunter Coast Lowland Flats Damp Forest	2C/Other		E. propinqua, E. microcorys, E. tereticornis

PCT Code	PCT Name	PKH Category	Primary_PKFT	Secondary_PKFT
3436	Hunter Coast Sandy Creekflat Low Paperbark Scrub	2A/Other	E. tereticornis	E. longifolia
3437	Hunter Coast Lowland Spotted Gum Dry Forest	2C		E. punctata
3438	Hunter Escarpment Footslopes Ironbark Forest	2C/Other		E. punctata
3439	Hunter Escarpment Grey Gum Sheltered Forest	2B		E. punctata
3441	Low Hunter Clay Heath	2C/Other		E. tereticornis
3443	Lower Hunter Spotted Gum Scrubby Transition Forest	2C		E. punctata
3444	Lower Hunter Spooted Gum-Ironbark Forest	2C		E. punctata
3445	Lower North Coastal Hills Red Gum Grassy Forest	Primary	E. tereticornis	
3446	Lower North Foothills Ironbark-Box-Gum Grassy Forest	2C		E. tereticornis
3447	Shoalhaven Foothills Spotted Gum Forest	2C		E. punctata
3448	Castlereagh Ironbark Forest	2C		E. punctata
3473	Bungonia Slates Shrubby Open Forest	2C/Other		E. melliodora
3474	Burragorang Escarpment Grey Gum Sheltered Forest	2B		E. punctata
3475	Burragong Escarpment Ironbark Forest	2B		E. punctata
3476	Burragong Escarpment Rocky Woodland	2C		E. punctata
3477	Burragorang Gorges Moist Fern Forest	2C		E. punctata, E. tereticornis, E. cypellocarpa,
3478	Burragorang Gorges Quartzite Grey Gum Forest	2B		E. punctata
3479	Burragorang Gorges Grey Gum-Stringybark Dry Forest	2B		E. punctata
3480	Capertee-Wolgan Escarpment Dry Forest	2B		E. punctata, E. cypellocarpa,
3481	Burragorang Gorges Felsic Stringybark Forest	2B		E. punctata, E. melliodora, E. tereticornis
3482	Burragorang Gorges Ironbark Grassy Forest	2B		E. punctata, E. tereticornis
3483	Central Gorges Box-Red Gum Grassy Forest	2B		E. tereticornis, E. melliodora, E. albens
3484	Burragorang Gorges Red Gum-Ironbark Sheltered Forest	2B		E. tereticornis, E. punctata
3486	Wollondilly-Shoalhaven Slopes Grassy Open Forest	2C		E. melliodora, E. blakelyi
3487	Douglas Scarp Woodland	2C/Other		E. tereticornis
3488	Ettrema Gorge Ironbark-Grey Gum Shrub Forest	2B		E. punctata

PCT Code	PCT Name	PKH Category	Primary_PKFT	Secondary_PKFT
3489	Hunter Escarpment Grey Box Forest	2B		E. albens, E. punctata
3492	Wollondilly-Shoalhaven Quartz Hills Forest	2C		E. punctata
3493	Southern Highlands Red Gum Forest	2B		E. tereticornis, E. punctata
3494	Western Blue Mountains Gorges Box Forest	2C		E. punctata, E. melliodora, E. blakelyi, E. tereticornis
3495	Western Blue Mountains Monkey Gum Gully Forest	2B		E. cypellocarpa, E. punctata
3496	Western Hunter Colluvial Grey Gum Forest	2B		E. punctata, E. blakelyi
3497	Western Hunter Escarpment Slaty Gum-Pine Forest	2C		E. albens
3509	Capertee Escarpment Slaty Gum-Ironbark Forest	2B		E. punctata
3510	Capertee Slopes Stringybark-Box Forest	2B		E. punctata, E. blakelyi, E. melliodora, E. cypellocarpa
3517	Northwest Creekflat Blakelys Red Gum Shrub-Grass Forest	2B		E. blakelyi
3519	Northwest Ranges Rocky Tumbledown Gum Scrub	2B		E. dealbata
3521	Northwest White Box Woodland	2B		E. albens, E. dealbata
3525	Upper Hunter Box-Blakelys Red Gum Grassy Forest	2B		E. blakelyi, E. albens, E. canaliculata, E. melliodora, E. tereticornis
3528	Western Hunter Flats Apple-Gum Shrub Forest	2C		E. blakelyi, E. melliodora
3529	Western Hunter Sandy Colluvial Gully Forest	2B		E. punctata, E. blakelyi
3530	Western Hunter Sandy Riparian Red Gum Shrub Forest	2B		E. blakelyi, E. punctata
3531	Western Hunter Trachyte Spinifex Forest	2B		E. dealbata
3532	Western Hunter Ironbark-Box Forest	2B		E. albens, E. blakelyi
3546	Coastal Sands Littoral Scrub-Forest	2A/Other	E. robusta	
3556	Umina Coastal Sand Woodland	2A/Other	E. robusta	
3579	Blue Mountains Scribbly Gum Swamp Woodland	2A/Other	E. parramattensis	
3581	Hunter Coast Foothills Apple Forest	2C/Other		E. punctata
3586	Northern Sydney Scribbly Gum Woodland	2C/Other		E. punctata
3587		2C/Other		
3588	Shoalhaven Foothills Bloodwood Heathy Forest	2C/Other		E. punctata

PCT Code	PCT Name	PKH Category	Primary_PKFT	Secondary_PKFT
3593	Sydney Coastal Sandstone Bloodwood Shrub Forest	2C/Other		E. punctata
3597	Watagan Escarpment Rocky Shrub Forest	2B		E. punctata
3599	Blue Mountains Peppermint Shrub Forest	2C		E. punctata, E. cypellocarpa
3600		2C		
3601	Burragorang Footslopes Scribbly Gum Forest	2C		E. punctata
3602	Burragorang Permian Sandstone Grey Gum-Peppermint Forest	2B		E. punctata
3603	Hawkesbury Escarpment Bloodwood Forest	2B		E. punctata
3604	Hunter Range Grey Gum-Stringybark Forest	2B		E. punctata
3605	Hunter Range Ironbark Forest	2B		E. punctata
3606	Hunter Range Peppermint Moist Gully Forest	2B		E. punctata
3607	Hunter Range Rockplate Scrub	2C		E. punctata
3608	Hunter Range Yellow Bloodwood Forest	2B		E. punctata
3610	Lower Hunter Yellow Bloodwood Forest	2C		E. punctata
3611	Nattai Plateau Bloodwood-Peppermint Forest	2C/Other		E. punctata
3612	Nattai Plateau Peppermint Gully Forest	2C		E. punctata
3613		2C		
3614	Southern Highlands Sandstone Peppermint Forest	2C		E. punctata
3615	Sydney Hinterland Apple-Blackbutt Gully Forest	2C		E. punctata
3616	Sydney Hinterland Grey Gum Transition Forest	2B		E. punctata
3617	Sydney Hinterland Peppermint-Apple Forest	2C/Other		E. punctata
3618	Sydney Hinterland Sandflat Peppermint Forest	2C/Other		E. punctata
3619	Sydney Hinterland Enriched Sandstone Bloodwood Forest	2C		E. punctata
3620	Sydney Hinterland Turpentine Sheltered Forest	2C		E. punctata
3621	Sydney Hinterland Turpentine-Apple Gully Forest	2C/Other		E. punctata
3622	Sydney Hinterland Yellow Bloodwood Woodland	2C		E. punctata
3623	Western Blue Mountains Grey Gum-Stringybark Forest	2B		E. punctata
3625	Wingecarribee Sandstone Shrub Forest	2C		E. punctata
3626	Wollemi Plateau Stringybark-Grey Gum Forest	2B		E. punctata

PCT Code	PCT Name	PKH Category	Primary_PKFT	Secondary_PKFT
3627	Wollemi Plateau Yertchuk-Stringybark Woodland	2C/Other		E. punctata
3628	Castlereagh Shrubby Swamp Woodland	Primary	E. parramattensis	E. longifolia
3629	Castlereagh Scribbly Gum Woodland	Primary	E. parramattensis	
3630	Kurri Sand Heathy Woodland	2A	E. parramattensis	E. punctata
3631	Kurri Sand-Clay Woodland	2A	E. parramattensis	E. punctata
3632	Mellong Sand Scribbly Gum Woodland	2A/2C	E. parramattensis	E. punctata
3633	Mellong Sand Swamp Woodland	Primary	E. parramattensis	
3634	Quorrobolong Sand Flats Forest	2B		E. punctata, E. tereticornis
3635	Thirlmere Sand Swamp Woodland	2A/Other	E. parramattensis	
3636	Warkworth Sands Woodland	2C/Other		E. tereticornis, E. blakelyi
3643	Bungonia Tableland Silvertop Ash-Stringybark Forest	2C/Other		E. punctata
3650	Goulburn-Lithgow Ranges Silvertop Ash Forest	2C/Other		E. cypellocarpa
3653	Kanangra Peaks Silvertop Ash Forest	2C/Other		E. cypellocarpa, E. punctata
3654	Shoalhaven Lowland Bloodwood Shrub Forest	2C		E. punctata
3657	South Coast Foothills Monkey Gum Sheltered Forest	2B		E. cypellocarpa
3660	South Coast Hinterland Yellow Stringybark Forest	2C		E. cypellocarpa
3667	Southern Highlands Enriched Sandstone Forest	2C		E. punctata, E. cypellocarpa
3686	Mount Airly Sandstone Forest	2C		E. punctata
3687	Newnes Plateau Peppermint-Ash Tall Forest	2C		E. cypellocarpa
3690	Southern Highlands Sandstone Rockplate Heath	2C/Other		E. punctata
3692	Upper Blue Mountains Moist Forest	2C		E. cypellocarpa
3693	Upper Blue Mountains Peppermint Dry Forest	2C		E. cypellocarpa
3695	Western Blue Mountains Peppermint Sheltered Forest	2C		E. punctata, E. cypellocarpa
3696	Western Blue Mountains Rocky Scribbly Gum Woodland	2C/Other		E. punctata
3724	Western New England Caleys Ironbark-Tumbledown Gum Forest	2B		E. dealbata
3731	Capertee Conglomerate Grey Gum-Stringybark Forest	2B		E. punctata
3732	Capertee Uplands Enriched Stringybark Forest	2B/Other		E. melliodora, E. punctata

PCT Code	PCT Name	PKH Category	Primary_PKFT	Secondary_PKFT
3734	Central Tableland Dry Slopes Stringybark-Box Forest	2C/Other		E. melliodora
3738	Goulburn-Lithgow Tableland Hills Grassy Forest	2C/Other		E. melliodora
3753	Dunedoo Sandstone Ironbark-Pine Forest	2A/Other	E. dwyeri	
3756	Gulgong Ranges Stringybark-Ironbark Forest	2C/Other		E. punctata
3760	Munghorn Sandstone Grey Gum-Stringybark Forest	2B		E. punctata, E. albens
3762	Northern Wollemi Rocky Stringybark Forest	2B		E. punctata
3763	Northwest Wollemi Colluvial Apple Forest	2C		E. punctata, E. blakelyi
3766		2C		
3767	Upper Hunter Escarpment Colluvial Ironbark Forest	2C		E. punctata, E. blakelyi
3768	Upper Hunter Ranges Enriched Ironbark Forest	2C		E. punctata
3769	Upper Hunter Sandstone Stringybark-Ironbark Forest	2C/Other		E. punctata
3772	Western Hunter Caleys Ironbark Low Forest	2C/Other		E. punctata, E. albens
3773	Western Hunter Currawang Low Forest	2A/Other	E. dwyeri	
3774	Western Hunter Dwyers Red Gum-Pine Woodland	Primary	E. dwyeri	
3775	Western Hunter Escarpment Ironbark Forest	2C/Other		E. punctata
3777	Western Hunter Grey Gum Sheltered Forest	2B		E. punctata
3778	Western Hunter Grey Gum-Stringybark Forest	2B		E. punctata
3780	Goulburn River Ironbark-Bloodwood Heathy Forest	2A/2C	E. dwyeri	E. punctata
3781	Ulan Sandstone Ironbark-Pine Woodland	2A/2C	E. dwyeri	E. punctata
3782	Western Hunter Rockplate Micromyrtus Heath	2A/Other	E. dwyeri	
3783	Western Hunter Rocky Sandstone Ironbark Forest	2A/2C	E. dwyeri	E. punctata
3784	Western Hunter Rocky Scrub	2A/Other	E. dwyeri	
3786	Western Hunter Scribbly Gum-Pine Woodland	2A/2C	E. dwyeri	E. punctata
3803	Northern Sandplain Damp Wallum Heath	2A/Other	E. parramattensis	
3807	Northern Sydney Heath-Mallee	2C/Other		E. punctata
3866	Wollemi Rockplate Scrub	2A/Other	E. dwyeri	
3872	Illawarra Basalt Melaleuca Scrub	2C/Other		E. tereticornis
3873		2C/Other		
3875	Southern Highlands Conglomerate Mallee Scrub	2C/Other		E. blakelyi, E. punctata

PCT Code	PCT Name	PKH Category	Primary_PKFT	Secondary_PKFT
3895	Budawang Damp Swamp Heath	2C		E. punctata
3904	Hunter Coast Grasstree Graminoid Swamp Scrub	2A/Other	E. tereticornis	
3905		2A/Other		
3906	Northern Lowland Clay Wet Heath	2A/Other	E. robusta	
3907	Lower North Sands Swamp Scrub	2A/Other	E. parramattensis, E. robusta, E. tereticornis	
3908	Lower North Sands Wallum Bottlebrush Swamp Heath	2A	E. robusta	
3909	Mellong Creekflat Wet Heath	2A	E. paramattensis	
3915	Northern Sands Prickly Tea-tree Wet Shrubland	2A/Other	E. robusta	
3921	Coastal Sydney Sand Saw-sedge Wet Shrubland	2A/Other	E. robusta	
3922	Sydney Coastal Sand Swamp Scrub	2A/Other	E. robusta	
3941	Megalong Valley Fringing Swamp Scrub	2C/Other		E. tereticornis
3959	Coast Sands Jointed Twig-rush Sedgeland	2A/Other	E. robusta	
3960	Coast Sands Cladium Sedgeland	2A/Other	E. robusta	
3961	Coast Sands Lepironia Sedgeland	2A/Other	E. robusta	
3972	Sydney Creekflat Wetland	2A/Other	E. robusta	
3983	Central Coast Flats Mesic Swamp Forest	Primary	E. robusta	
3985	Coastal Floodplain Swamp Paperbark Scrub	2A/Other	E. robusta	E. longifolia
3986	Coastal Sands Swamp Mahogany Rush Forest	Primary	E. robusta	
3987	Far North Floodplain Paperbark-Swamp Oak Forest	2A/Other	E. tereticornis	
3988	Far North Mesophyll Paperbark Swamp Forest	2A/Other	E. robusta	
3995	Hunter Coast Paperbark-Swamp Mahogany Forest	2A	E. robusta, E. tereticornis	
3996	Coastal Sand Swamp Mahogany Dry Forest	Primary	E. robusta	
3997	Hunter Coast Sandplain Sedge Paperbark Wetland	2A	E. robusta	
3998	Lower North Creekflat Mahogany Swamp Forest	2A	E. robusta, E. tereticornis, E. parramattensis	
4000	Northern Estuarine Paperbark Sedge Forest	2A/Other	E. robusta	
4004	Northern Melaleuca quinquenervia Swamp Forest	2A	E. robusta	

PCT Code	PCT Name	PKH Category	Primary_PKFT	Secondary_PKFT
4006	Northern Paperbark-Swamp Mahogany Saw-sedge Forest	2A	E. robusta	
4007	Northern Sands Paperbark Sedge Low Forest	2A		
4008	Northern Sands Swamp Mahogany Shrubby Rush Forest	2A	E. robusta	
4009	Shoalhaven Lowland Flats Wet Swamp Forest	2A	E. robusta	E. longifolia
4010	Sydney Hinterland Creekflat Paperbark Scrub	2C/Other		E. punctata
4012	Tomago Drooping Red Gum Swamp Woodland	Primary	E. parramattensis, E. robusta	
4013	Wyong Paperbark-Woollybutt Swamp Forest	2A/2B	E. robusta	E. longifolia
4015	Central Hunter Swamp Oak Riparian Forest	2A/2C	E. tereticornis	E. blakelyi, E. melliodora
4019	Coastal Alluvial Bangalay Forest	2A/2C	E. robusta	E. longifolia
4020	Coastal Creekflat Layered Grass-Sedge Swamp Forest	Primary	E. robusta, E. tereticornis	E. longifolia
4021	Coastal Creekline Dry Shrubby Swamp Forest	2A	E. robusta	
4023	Coastal Valleys Swamp Oak Riparian Forest	2A	E. tereticornis	
4024	Cumberland Blue Box Riverflat Forest	2A	E. tereticornis	
4025	Cumberland Red Gum Riverflat Forest	Primary	E. tereticornis	
4026	Estuarine Sea Rush Swamp Oak Forest	2C/Other		E. tereticornis
4036	Hunter Coast Lake Flats Apple Forest	2A	E. tereticornis	
4038	Hunter Estuarine Melaleuca nodosa Scrub	2A/2C	E. robusta	E. longifolia
4039	Hunter Range Creekflat Apple-Red Gum Forest	2A/2C	E. tereticornis	E. punctata
4042	Lower North Riverflat Eucalypt-Paperbark Forest	2A/2C	E. tereticornis	E. propinqua, E. microcorys
4044	Northern Creekflat Eucalypt-Paperbark Mesic Swamp Forest	2A/2C	E. robusta	E. microcorys
4047	Northern Swamp Mahogany-Bottlebrush Swamp Forest	Primary	E. robusta	
4048	Northern Swamp Oak-Paperbark Forest	2A/Other	E. robusta	
4049	South Coast Floodplain Grassy Swamp Forest	2A/2C	E. robusta, E.tereticornis	E. longifolia
4050	South Coast Floodplain Wetland Paperbark Scrub	2A	E. robusta	
4051	South Coast Lowland Red Gum-Swamp Oak Forest	2C		E. tereticornis
4052	South Coast Low Hills Red Gum Grassy Forest	Primary	E. tereticornis	
4057	Sydney Creekflat Swamp Mahogany-Paperbark Forest	Primary	E. robusta	

PCT Code	PCT Name	PKH Category	Primary_PKFT	Secondary_PKFT
4058	Sydney Hinterland Red Gum Riverflat Forest	2A	E. tereticornis	E. punctata
4059	Sydney Hinterland Sandy Creekflat Shrub Forest	2A/2C	E. tereticornis	E. punctata
4064	Central Eastern Ranges River Oak Forest	2A/Other	E. tereticornis	
4068	Ettrema Plateau Riparian Scrub	2B		E. cypellocarpa
4079	Northern Hinterland Grassy River Oak Forest	2A	E. tereticornis	
4080	Northwest River Oak-Apple Forest	2A/2C	E. camaldulensis	E. blakelyi
4081	Northwest River Oak-River Red Gum Forest	Primary	E. camaldulensis	
4084	Southern Escarpment River Oak Forest	2A/Other	E. tereticornis	
4089	Namoi-Upper Hunter River Red Gum Forest	Primary	E. camaldulensis	
4106	Illawarra Escarpment Cool Temperate Rainforest	2C/Other		E. cypellocarpa
4127	Colo Plateau Dwarf Apple Heath-Woodland	2C/Other		E. punctata
4146	Illawarra Sands Littoral Rainforest	2A	E. robusta	
4156	Maroota Sands Swamp Forest	Primary	E. robusta	


Koala 2026,
Campbelltown LGA
Koala 2026,
Hawkesbury LGA
SYDNEY BASIN
koala network
Supported by Total Environment Centre and WIRES