# Cooplacurripa Nature Repair Market – Year 2 Planting Area

## SITE ASSESSMENT REPORT

REPLANTING NATIVE FOREST AND WOODLAND ECOSYSTEMS

SEPTEMBER 2026

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## Document overview

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# Certification

This Site Assessment Report was prepared by suitably qualified person Cecilia Phu (Principal Botanist) in accordance with the requirements set out in Division 2.5, Section 35 of the *Replanting Native Forests and Woodland Ecosystems (Methodology Determination) 2025*.

Field work was led by and completed under the direction of suitably qualified persons, Cecilia Phu (Principal Botanist) and Martin Campbell (Ecology Manager).

A summary of the qualifications and experience of key contributors is provided in Table 1, with full curriculum vitae for suitably qualified persons provided in Appendix A: Curriculum Vitae (Suitably Qualified Persons).

**Table 1: Suitably qualified persons and contributors**

| Name | Contact details | Role / responsibility | Qualification | Relevant experience |
|---|---|---|---|---|
| **Cecilia Phu (Nature Positive Advisory Pty Ltd)** | info@naturepositiveadvisory.au | Suitably Qualified Person, Principal Botanist<br>• Field survey lead<br>• Report preparation | Bachelor of Science with Honours (Biological Sciences)<br>Accredited assessor under the NSW Biodiversity Assessment Method (BAM) Accreditation Scheme. | Botanist and ecological consultant with over 19 years of consulting experience across NSW, specialising in vegetation surveys and threatened species assessments to inform environmental planning and approvals, and biodiversity offsetting. |
| **Signature** | | | **Date:** 23/09/2026 | |
| **Martin Campbell (Covalent Land Australia Pty Ltd)** | enquire@covalentland.au | Suitably Qualified Person, Ecology Manager<br>• Field survey<br>• Report contributor | Bachelor of Science (Vegetation Ecology) | Ecologist with 25+ years' experience managing natural resources across large, complex land portfolios.<br>His expertise includes bushfire preparedness, invasive species management, threatened species programs, cultural and heritage management, and safety and risk-led project delivery. |
| **Signature** | | | **Date: 22/09/2026** | |

| Name | Contact details | Role / responsibility | Qualification | Relevant experience |
|---|---|---|---|---|
| **Nathan Garvey (Nature Positive Advisory Pty Ltd)** | info@naturepositiveadvisory.au | Suitably Qualified Person, Principal Advisor<br>• Technical oversight | Fellow of the Environment Institute of Australia and New Zealand (FEIANZ)<br>Certified Environmental Practitioner (CEnvP)<br>Biodiversity Assessment Method (BAM) Accredited Assessor<br>Member of the Environment Institute of Australia and New Zealand (MEIANZ)<br>Graduate Diploma (Biological Science)<br>Bachelor of Science | Experienced ecologist with over 20 years' practice in leading ecological assessments and approvals across eastern Australia. Nathan is one of NSW's leading experts in biodiversity approvals and offsetting. |
| **Cuong Tran (Covalent Land Australia Pty Ltd)** | enquire@covalentland.au | Suitably Qualified Person, Chief Executive Officer<br>• Technical oversight<br>• Report technical review | PhD Fire Ecology and Flammability.<br>Bachelor of Science (Biology)<br>Healthy Land & Water Science Committee Member (2023-current). | Cuong is an ecologist with over 20 years' experience in bushfire research and management and is a recognised expert in the field of fire management, ecology and planning. |
| **Jay van Rijn (Covalent Land Australia Pty Ltd)** | enquire@covalentland.au | Suitably Qualified Person, Chief Operations Officer<br>• Project scope, planning, method alignment<br>• Report technical review | Bachelor of Science with Honours. | Jay is an environmental scientist with over 15 years' experience in environmental compliance and markets. |
| **Gemma van Hemert (Nature Positive Advisory Pty Ltd)** | info@naturepositiveadvisory.au | Graduate Ecologist<br>• Report assistance<br>• Field survey assistance | Bachelor of Environmental Science and Management | Gemma is an early career ecologist with over 2 years' experience working as an environmental professional. |
| **Rosie Walshe (Covalent Land Australia Pty Ltd)** | enquire@covalentland.au | Project Lead<br>• Report assistance<br>• Field survey assistance | Bachelor of Science (Geology)<br>Master of Environment | Rosie is an environmental professional with over 4 years' experience working with vegetation methods in the Australian carbon market and related schemes. |

| Name | Contact details | Role / responsibility | Qualification | Relevant experience |
|---|---|---|---|---|
| **Tegan Scott (Covalent Land Australia Pty Ltd)** | enquire@covalentland.au | GIS Spatial Data Analyst<br>Project mapping | Bachelor of Environmental Science and Management | Tegan is a Geospatial Analyst with three years' experience working with natural resource systems and<br>developed expertise in GIS, spatial analysis, and project management. |

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# Glossary of Terms

| Term | Detail |
|---|---|
| **AA** | Activity Area |
| **AACo** | Australian Agricultural Company |
| **ACCU** | Australian Carbon Credit Unit |
| **BMWS** | Bushfire Mitigation Works Schedule |
| **CEA** | Carbon Estimation Area |
| **Cooplacurripa** | Cooplacurripa Station |
| **DCCEEW** | Department of Climate Change, Energy, the Environment and Water (Commonwealth) |
| **EP** | Environmental planting |
| **ha** | Hectares |
| **IUCN** | The International Union for Conservation of Nature |
| **LGA** | Local Government Area |
| **MVG** | Major Vegetation Group (level 5 “association level” of the IUCN Global Ecosystem Typology |
| **MVS** | Major Vegetation Sub-group (level 6 “sub-association level” of the IUCN Global Ecosystem Typology |
| **NARCliM** | NSW and Australian Regional Climate Modelling project |
| **NPWS** | National Parks and Wildlife Service |
| **NRM** | Natural Resource Management |
| **the Method** | Nature Repair (Replanting Native Forest and Woodland Ecosystems) Methodology Determination 2025 |
| **NVIS** | National Vegetation Information System |
| **PCT** | Plant Community Type |
| **PLANR** | Platform for Land and Nature Repair |
| **PMST** | Protected Matters Search Tool |
| **PP** | Project Plan |
| **Project** | Silva Capital Cooplacurripa Biodiversity Project No. 2 |
| **PVCS** | Prescribed Vegetation Classification System |
| **RCP** | Representative Concentration Pathway |
| **SAA** | Sub-activity Area |
| **SAR** | Site Assessment Report |
| **SSA** | Starting state assessment |
| **TEC** | Threatened ecological communities |

# 1. Introduction

Silva Capital Cooplacurripa Biodiversity Project No. 2 (the Project) is a biodiversity planting (EP) project that will be registered under the Nature Repair Market Scheme in accordance with the *Nature Repair (Replanting Native Forest and Woodland Ecosystems) Methodology Determination 2025* (the Method). The Project aims to restore ecosystems representing several major vegetation groups (MVGs), including Eucalypt Tall Open Forests, Eucalypt Woodlands, Casuarina Forests and Woodlands and Rainforests and Vine Thickets to predominantly cleared land. The Project materially overlaps with Phase 2 of the Cooplacurripa Environmental Planting Project (Phase 2 EP Project), which is a related project registered under the Australian Carbon Credit Unit (ACCU) Scheme.

This Site Assessment Report (SAR) has been prepared for the Project as required by Section 26(2) of the Method. The purpose of this SAR is to document the results of an assessment of the starting ecosystem condition state of the Project area (the starting state assessment, or SSA), undertaken in accordance with Division 2.5 of the Method. The starting ecosystem condition and its associated starting ecosystem indicator values form the baseline for measuring changes in ecosystem condition over the life of the Project.

## 1.1 Project Description

Silva Capital Pty Ltd (Silva Capital) acquired the Cooplacurripa Station (Cooplacurripa) in September 2024 to establish a large-scale EP project. Cooplacurripa is an historic 23,000 hectare (ha) pastoral property located on Biripi/Birpai Country in the Upper Manning Catchment (mid-north coast, NSW) and is surrounded by national parks, state forests, conservation areas and nature reserves (Figure 1).

There are over 6,500 ha of Cooplacurripa identified as suitable for reforestation. Silva Capital Cooplacurripa Biodiversity Project No. 1 was registered in August 2025 and involves the restoration of over 430 ha of land overlapping with Phase 1 of the Cooplacurripa Environmental Planting Project (Phase 1 EP Project). This Project (i.e. Project No. 2) will involve replanting over 1,200 ha of land along the Cooplacurripa River valley floor and lower to mid slopes, providing vegetated connections across the valley floor and enhancing landscape connectivity more broadly.

## 1.2 Report Scope

This SAR is required to comply with Division 2.5, Section 35 of the Method. Appendix B: Site Assessment Report Requirements sets out the minimum information required by Section 35 of the Method and where it is addressed in this SAR.

This SAR is broadly set out as follows:

- Section 2 – provides site details and designates activity areas for the Project
- Section 3 – relates to any Indigenous matters that have informed the design and/or implementation of Project, and describes:
  - any relevant engagement undertaken with Indigenous representatives
  - any Indigenous land interest areas or culturally sensitive areas where present
  - any data or knowledge derived from Indigenous engagement
- Section 4 – describes natural features, potential threats, land use history, legal encumbrances or covenants, and any other relevant feature that may affect Project outcomes
- Section 5 – presents the findings of the SSA, including:
  - reference ecosystem and benchmark assignment,
  - establishment of permanent sampling plots,
  - determination of the starting ecosystem condition state of each activity area,

– calculation of the starting and forecast ecosystem and biodiversity persistence scores for each activity area, and
– calculation of the starting and forecast aggregate ecosystem and biodiversity persistence scores for the Project.

## 1.3 Data Sources

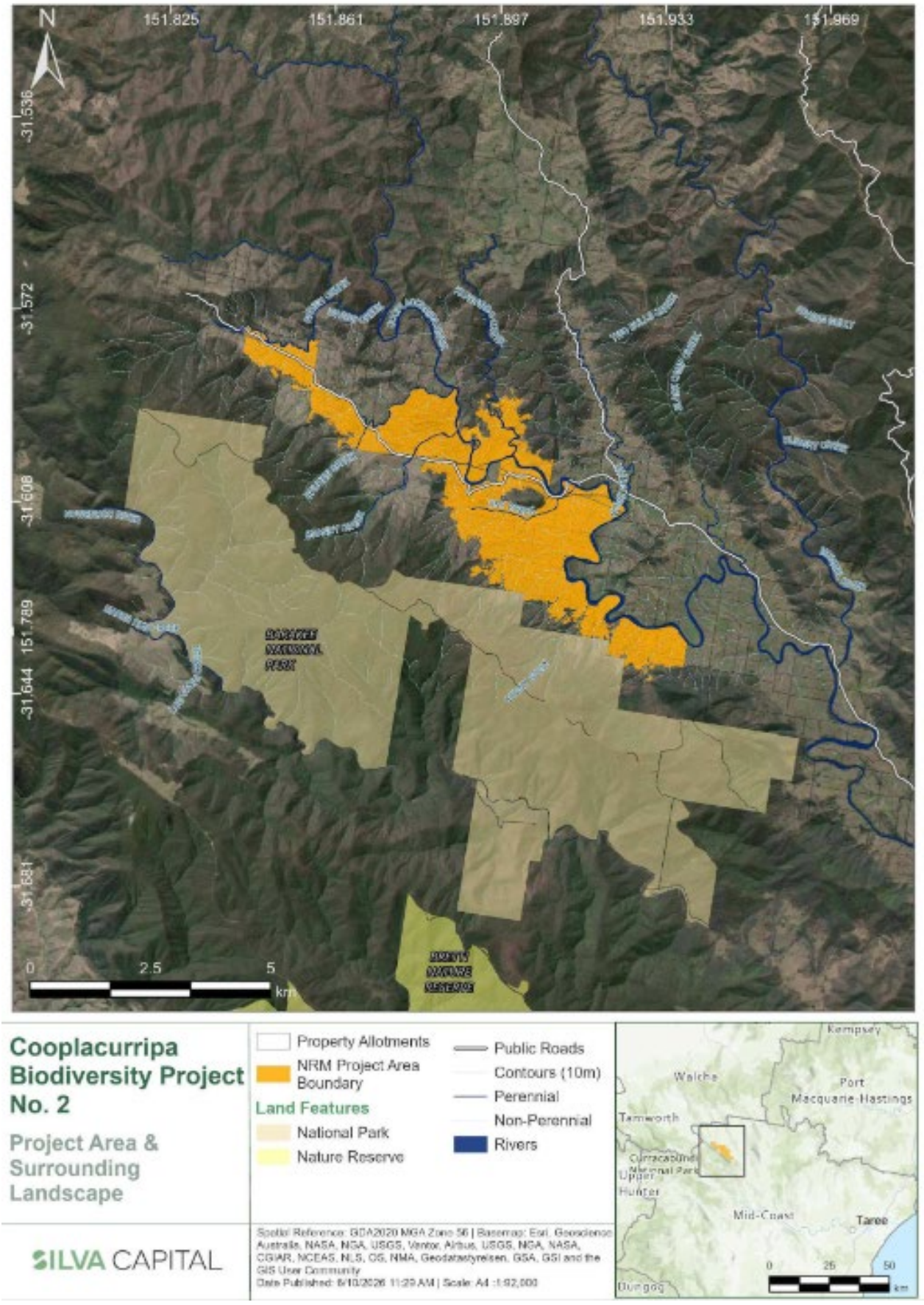
This SAR has been informed by the data sources listed in Table 2 below.

**Table 1: Data sources**

| Data source | Description |
|---|---|
| **Government register search outputs** | • Land title register search<br>• Cultural heritage register search |
| **Environmental data** | • Hydrological layers<br>• Contour and elevation layers<br>• NSW Land use Mapping (NSW DCCEEW, 2017)<br>• Rainfall and climate data (CSIRO and Bureau of Meteorology, 2025; NSW Government, 2024)<br>• Natural Resource Management regions dataset “NRM_regions2023” as viewed in the Digital Atlas of Australia (DCCEEW, 2023)<br>• Interim Biogeographic Regionalisation for Australia (IBRA) Version 7 (DCCEEW, 2020)<br>• Geology data for New South Wales (DPIRD, 2025b)<br>• Flood data for NSW (SES, 2026)<br>• Bushfire data (NSW DCCEEW, 2026)<br>• Drought data (DPIRD, 2026a; DPIRD, 2026b; DPIRD, 2025a; DPIRD, 2024) |
| **Imagery** | • High-resolution aerial (Agronomeye, 2025) provided by Covalent<br>• World Imagery Wayback (Esri, 2014) for archived World Imagery basemaps |
| **Land management information** | • Fencelines and gates<br>• Tracks<br>• Management records (including pest treatments) since property purchase in 2024. Records from previous owners unavailable. |
| **Administrative boundaries** | • NSW cadastre<br>• Project 2 boundary (provided by Covalent)<br>• National Parks estate (NSW DCCEEW, 2026)<br>• State Forests (Forestry Corporation of NSW, 2022) |

| Data source | Description |
|---|---|
| **Vegetation data** | • Extant and Pre-1750 (pre-clearing) NSW State Vegetation Type Mapping (SVTM) (NSW DCCEEW, 2026b; NSW DCCEEW, 2026c)<br>• NVIS extant and pre-1750 vegetation types mapping (DCCEEW, 2024)<br>• IUCN Global Ecosystem Typology 2.0 Descriptive profiles for biomes and ecosystem functional groups (Keith, Ferrer-Paris, Nicholson, & Kingsford, 2020)<br>• NVIS Fact Sheet series on Major Vegetation Groups (DoEE, 2017)<br>• Plant Community Types vegetation profiles from the NSW Vegetation Classification database (NSW DCCEEW, 2026b)<br>• Prescribed Vegetation Classification System dataset (DCCEEW, 2026) |
| **Threatened species database searches** | • Protected Matters Search Tool (DCCEEW, 2025a)<br>• BioNet Atlas of NSW Wildlife (NSW DCCEEW, 2026a) |
| **Field data** | • Rapid assessment data points<br>• Ground-truthing surveys<br>• Sampling Plots |

## Figure 1: Project Area and Surrounding Landscape



# 2. Site Details

## 2.1 Proponent Details

| | |
|---|---|
| **Project name** | Silva Capital Cooplacurripa Biodiversity Project No.2 |
| **Project ID** | NR001019 |
| **Proponent details** | Silva Capital Pty Ltd<br>ACN: 666 501 846 |

## 2.2 Project Area Details

The Project is located entirely within the Cooplacurripa property, occupying approximately 1,329 ha of land along the valley slopes and floor. Cooplacurripa is located within the Hunter Natural Resource Management (NRM) region and within the Mid Coast Local Government Area (LGA).

The street address for Cooplacurripa Station is:

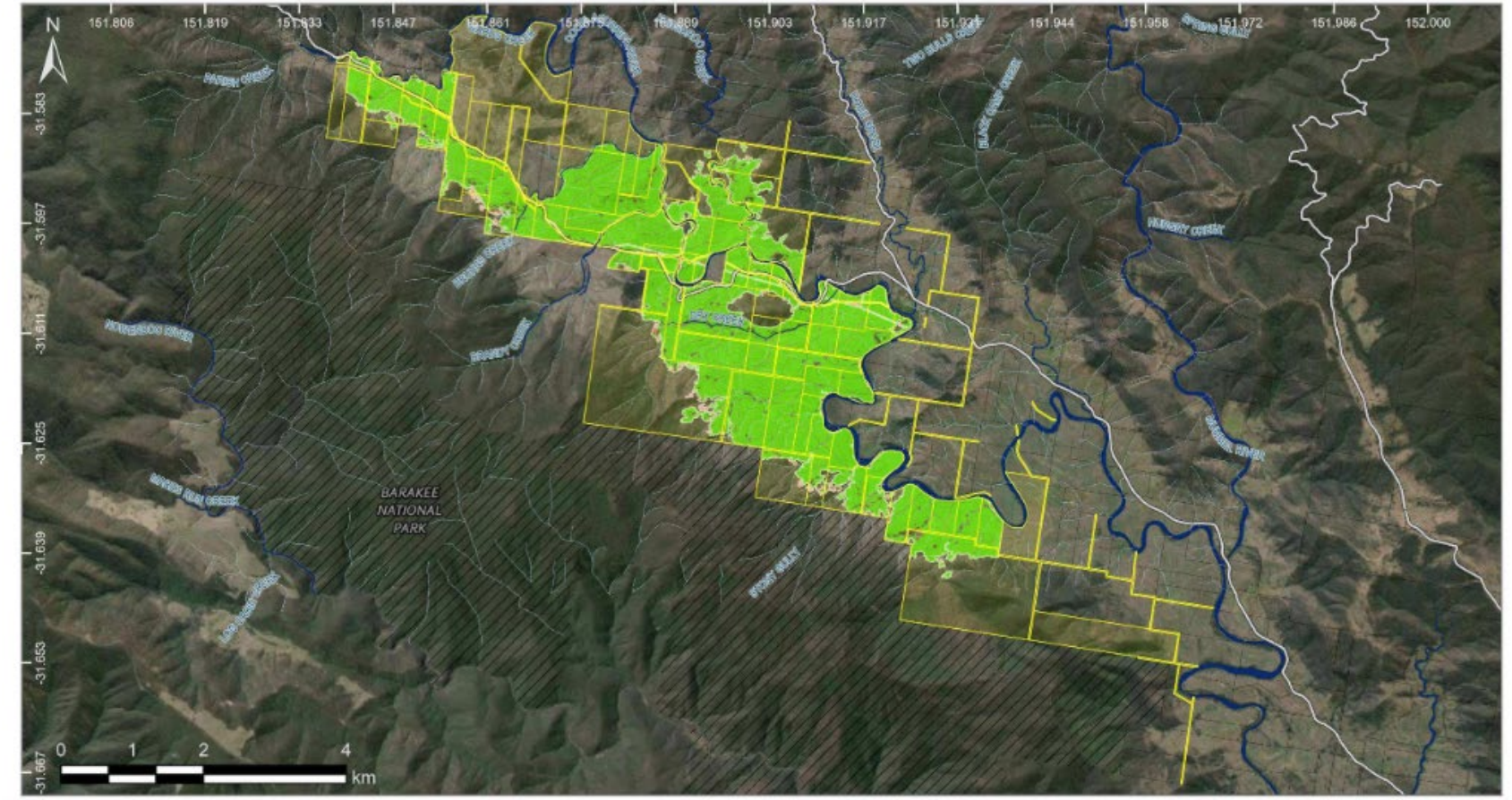
- 6167 Nowendoc Road, Cooplacurripa, NSW, 2424.

The Project is located within the land parcels listed in Table 3 below and shown in Figure 2.

**Table 2: Lot and Deposited Plan numbers for the Project Area**

| Lot no. | Deposited Plan (DP) |
|---|---|
| **1, 2, 3, 4, 5, 6, 7** | DP115536 |
| **7, 8, 11, 12, 13, 14** | DP1193086 |
| **15** | DP1193087 |
| **21** | DP1193089 |
| **14** | DP1234304 |
| **167** | DP43059 |
| **179** | DP43925 |
| **482** | DP625808 |
| **1, 3, 4, 5, 6, 7, 8, 9** | DP753690 |
| **11, 12, 13, 14, 16, 17, 18, 19** | |
| **28, 30, 34, 35, 36, 37, 38, 39** | |
| **40, 41, 46, 47** | |
| **52, 56, 57, 59** | |
| **60, 61, 62, 63, 64, 65, 67** | |
| **73, 74, 75, 76, 77, 78, 79** | |
| **80, 81, 82, 83, 85, 86** | |
| **122, 126, 129, 130** | |
| **156, 159** | |
| **4, 5, 6, 14, 15, 58, 59, 101, 154** | DP753703 |

## Figure 2: Project Area and Property Allotments




| Lot & Plan No. | Lot & Plan No. | Lot & Plan No. | Lot & Plan No. | Lot & Plan No. | Lot & Plan No. | Lot & Plan No. | Lot & Plan No. | Lot & Plan No. |
|---|---|---|---|---|---|---|---|---|
| 167DP43059 | 19DP753690 | 34DP753690 | 59DP753690 | 63DP753690 | 159DP753690 | 78DP753690 | 15DP753703 | 4DP753703 |
| 60DP753690 | 36DP753690 | 9DP753690 | 56DP753703 | 61DP753690 | 4DP753690 | 1DP115536 | 482DP625808 | 73DP753690 |
| 85DP753690 | 12DP753690 | 62DP753690 | 3DP753690 | 77DP753690 | 2DP115536 | 41DP753690 | 131DP753690 | 6DP753690 |
| 81DP753690 | 16DP753690 | 15DP1193087 | 76DP753690 | 3DP115536 | 56DP753690 | 7DP115536 | 156DP753690 | 179DP43925 |
| 18DP753690 | 126DP753690 | 13DP1193086 | 58DP753703 | 58DP753690 | 28DP753690 | 6DP753690 | 130DP753690 | 7DP1193086 |
| 1DP753690 | 35DP753690 | 14DP1193086 | 40DP753690 | 129DP753690 | 62DP753690 | 47DP753690 | 5DP753703 | 8DP1193086 |
| 86DP753690 | 11DP753690 | 21DP1193089 | 5DP753690 | 39DP753690 | 75DP753690 | 83DP753690 | 46DP753690 | 11DP1193086 |
| 30DP753690 | 79DP753690 | 101DP753703 | 37DP753690 | 60DP753690 | 122DP753690 | 176DP43060 | 154DP753703 | 12DP1193086 |
| 14DP753690 | 7DP753690 | 6DP753703 | 67DP753690 | 57DP753690 | 38DP753690 | 5DP115536 | 74DP753690 | 14DP1234304 |
| 93DP753690 | 13DP753690 | 52DP753690 | 64DP753690 | 6DP115536 | 65DP753690 | 14DP753703 | 4DP115536 | |

Spatial Reference: GDA2020 MGA Zone 56 | Basemap: Esri, Geoscience Australia, NASA, NGA, USGS, Vantor, Airbus, USGS, NGA, NASA, CGIAR, NCEAS, N.S. GS, NMA, Geodatastyrelsen, GSA, GSI and the GIS User Community | Date Published: 6/10/2026 11:29 AM | Scale: A4 1:72,000

## 2.3 Activity Areas and Sub-Activity Areas

The Project Area is 1327.84 ha in size and is stratified into activity areas and sub-activity areas in accordance with Division 2.4 of the Method.

Eight activity areas are identified covering 1230.32 ha of the Project Area. These activity areas represent four major vegetation groups (MVGs) classified under the National Vegetation Information System (NVIS) occurring in two starting ecosystem condition states (i.e. state B and C). Two of the activity areas are further divided into sub-activity areas as required for the assignment of reference ecosystems. The activity areas and sub-activity areas identified in the Project Area are listed in Table 4 and shown on Figure 3.

These activity areas comply with the requirements set out in Section 22 of the Method (refer to Table 5).

**Table 3: Activity areas (AAs) and sub-activity areas (SAA) in the Project Area**

| Activity Area (AA) | IUCN Global Typology Functional Group | NVIS Major vegetation group (MVG) | NVIS Major vegetation sub-group (MVS) | Starting state | Reference ecosystem[1] | Area (ha) |
|---|---|---|---|---|---|---|
| **AA1** | T1.2 Tropical / subtropical dry forests and thickets | MVG 1 - Rainforests and Vine Thickets | MVS 62 - Dry rainforest or vine thickets | B | 3076 \| Hunter Valley Whalebone Dry Rainforest | 1.43 |
| **AA2** | T1.2 Tropical / subtropical dry forests and thickets | MVG 1 - Rainforests and Vine Thickets | MVS 62 - Dry rainforest or vine thickets | C | 3076 \| Hunter Valley Whalebone Dry Rainforest | 4.28 |
| **AA3 (SAA1)** | T2.5 Temperate pyric humid forests | MVG 2 - Eucalypt Tall Open Forests | MVS 60 - Eucalyptus tall open forests and open forests with ferns, herbs, sedges, rushes or wet tussock grasses | B | 3240 \| Lower North Escarpment Red Gum Grassy Forest | 16.06 |
| **AA3 (SAA2)** | | | | | 3252 \| Northern Hinterland Grey Gum-Mahogany Grassy Forest | 5.33 |
| **AA4 (SAA3)** | T2.5 Temperate pyric humid forests | MVG 2 - Eucalypt Tall Open Forests | MVS 60 - Eucalyptus tall open forests and open forests with ferns, herbs, sedges, rushes or wet tussock grasses | C | 3240 \| Lower North Escarpment Red Gum Grassy Forest | 310.01 |
| **AA4 (SAA4)** | | | | | 3252 \| Northern Hinterland Grey Gum-Mahogany Grassy Forest | 84.69 |
| **AA5** | T4.4 Temperate woodlands | MVG 5 - Eucalypt Woodlands | MVS 9 - Eucalyptus woodlands with a tussock grass understorey | B | 3329 \| Northern Hinterland Valleys Red Gum Grassy Forest | 5.21 |
| **AA6** | T4.4 Temperate woodlands | MVG 5 - Eucalypt Woodlands | MVS 9 - Eucalyptus woodlands with a tussock grass understorey | C | 3329 \| Northern Hinterland Valleys Red Gum Grassy Forest | 709.08 |

| Activity Area (AA) | IUCN Global Typology Functional Group | NVIS Major vegetation group (MVG) | NVIS Major vegetation sub-group (MVS) | Starting state | Reference ecosystem[1] | Area (ha) |
|---|---|---|---|---|---|---|
| **AA7** | TF1.2 Subtropical / temperate forested wetlands | MVG 8 - Casuarina Forests and Woodlands | MVS 26 - Casuarina and Allocasuarina forests and woodlands | B | 4079 \| Northern Hinterland Grassy River Oak Fores | 1.24 |
| **AA8** | TF1.2 Subtropical / temperate forested wetlands | MVG 8 - Casuarina Forests and Woodlands | MVS 26 - Casuarina and Allocasuarina forests and woodlands | C | 4079 \| Northern Hinterland Grassy River Oak Fores | 92.98 |
| **Total (ha)** | | | | | | 1,230.32 |

[1] Plant Community Type (PCT) under the NSW Vegetation Classification System.

## Table 4: Requirements for Activity Areas (Section 22 of the Method)

| Section 22 Requirement | Details on how requirements were met |
|---|---|
| 1. **An area of a stratification may be designated an activity area if:**<br>a. **it consists of eligible land; and**<br>b. **the project proponent proposes to carry out environmental plantings in the area as part of the replanting project.** | The nominated activity areas across Cooplacurripa qualify as 'eligible land' under the Nature Repair Market's (Replanting Native Forest and Woodland Ecosystems) Methodology Determination 2025:<br>• The land was comprehensively cleared more than 15 years prior to the application date, and the canopy layer of native trees has been removed/cleared from at least 90% of the land defined at a 10 m x 10 m scale.<br>• Prior to comprehensively clearing, the land supported native woody vegetation that provided forest cover across the entirety of the activity area, defined at a 0.2 ha scale, and still has forest cover potential.<br>• In the past three years prior to the application date there has been no damaged or destroyed native vegetation in the activity area.<br>• Some existing woody biomass was identified in each activity area as specified in Table 12. The woody biomass represents regenerating occurrences of native canopy species that are:<br>– consistent with the reference ecosystem for the area, and<br>– did not exceed a diameter at breast height of 5 cm, and<br>– did not exceed a density of more than 3 stems (that are more than 50 cm tall) per 10 m x 10 m area of land.<br>The nominated activity areas will be subject to environmental plantings as part of the Project:<br>• Mixed species environmental plantings are proposed to be carried out in all activities to reflect community structures and distributions of pre-clearing plant community types (PCTs), introducing an appropriate combination of species from the canopy layer, mid-storey layer and ground layer that collectively are capable of achieving forest cover within 25 years after the initial planting.<br>• Planting in a block design (multiple rows of contiguous areas) that is likely to result in a structure and composition of a forest that is consistent with the reference ecosystem for the activity area or sub-area<br>• Tubestock planting of species that are native to the project, are sourced locally and appropriate to the biophysical characteristics of the activity area or sub-area will be predominantly used. Broadcast drone seeding is planned for discrete areas which are unsuitable for typical site preparation methods. |

| Section 22 Requirement | Details on how requirements were met |
|---|---|
| 2. **An activity area must not include any 10m x 10m area of land within the area:**<br>a. **for which no environmental plantings are proposed for the purposes of the replanting project; or**<br>b. **that has forest cover; or**<br>c. **that does not have forest cover potential; or**<br>d. **that is excluded water.** | Activity areas have been stratified to align with the Carbon Estimation Areas (CEA) for the environmental plantings project using high quality imagery to exclude areas of forest, including individual trees that are already above 2 metre height, or does not have forest cover potential, or for any areas of land for which no environmental planting project is proposed. |
| 3. **An activity area may consist of a single contiguous area, or multiple disconnected areas.** | Each activity area comprises of a single contiguous area, or multiple disconnected areas. |
| 4. **Each activity area or sub-area must be at least 0.2 hectares, and the activity areas together must be at least 5 hectares.** | All activity areas are greater than 1 hectare and collectively all activity areas are greater than 1200 hectares. |
| 5. **(5) Subject to subsections (6) and (7), any 900m$^2$ section of an activity area must have an average width of at least 30m, measured on the narrowest side.**<br>6. **For the purposes of subsection (5), the project proponent may treat a group of contiguous activity areas as a single activity area.**<br>7. **If the activity area, or group of contiguous activity areas, directly adjoins:**<br>a. **inland water; or**<br>b. **native forest; or**<br>c. **an area that:**<br>i. **has been planted; and**<br>ii. **has forest cover potential;**<br>**any 900m$^2$ section of the area must have an average width of at least 10m, measured on the narrowest side.** | This has been reviewed through spatial analysis across all eight activity areas. Ground verification was undertaken through supervised sampling by Nature Positive Advisory and Covalent during site visits in October 2025, November 2025, December 2025, January 2026 and March 2026.<br>To satisfy the minimum width requirements of Section 22, the activity area underwent a targeted erosion and buffer process. Specifically, the shapes were eroded and buffered by 5 m adjacent to inland water or native forest, and by 15 m elsewhere removing slivers below the minimum 10 m and 30 m width requirements. |
| 8. The whole of an undivided activity area must have the same reference ecosystem. | Undivided activity areas have the same reference ecosystem. |
| 9. The whole of each sub-area of a divided activity area must have the same reference ecosystem, and all the sub-areas must have reference ecosystems from the same major vegetation group. | Activity areas 4 & 5 have sub-areas which have reference ecosystems from the same major vegetation groups as detailed in Table 4:. |
| 10. The whole of an activity area must:<br>a. have the same starting ecosystem condition state; and<br>b. be the subject of proposed environmental plantings with the same nominated restoration target. | Each activity area has a consistent starting ecosystem condition state. This was confirmed through field survey and plot work.<br>Each activity area has one nominated restoration target. Refer to Table 5 of the Project Plan for more information. |

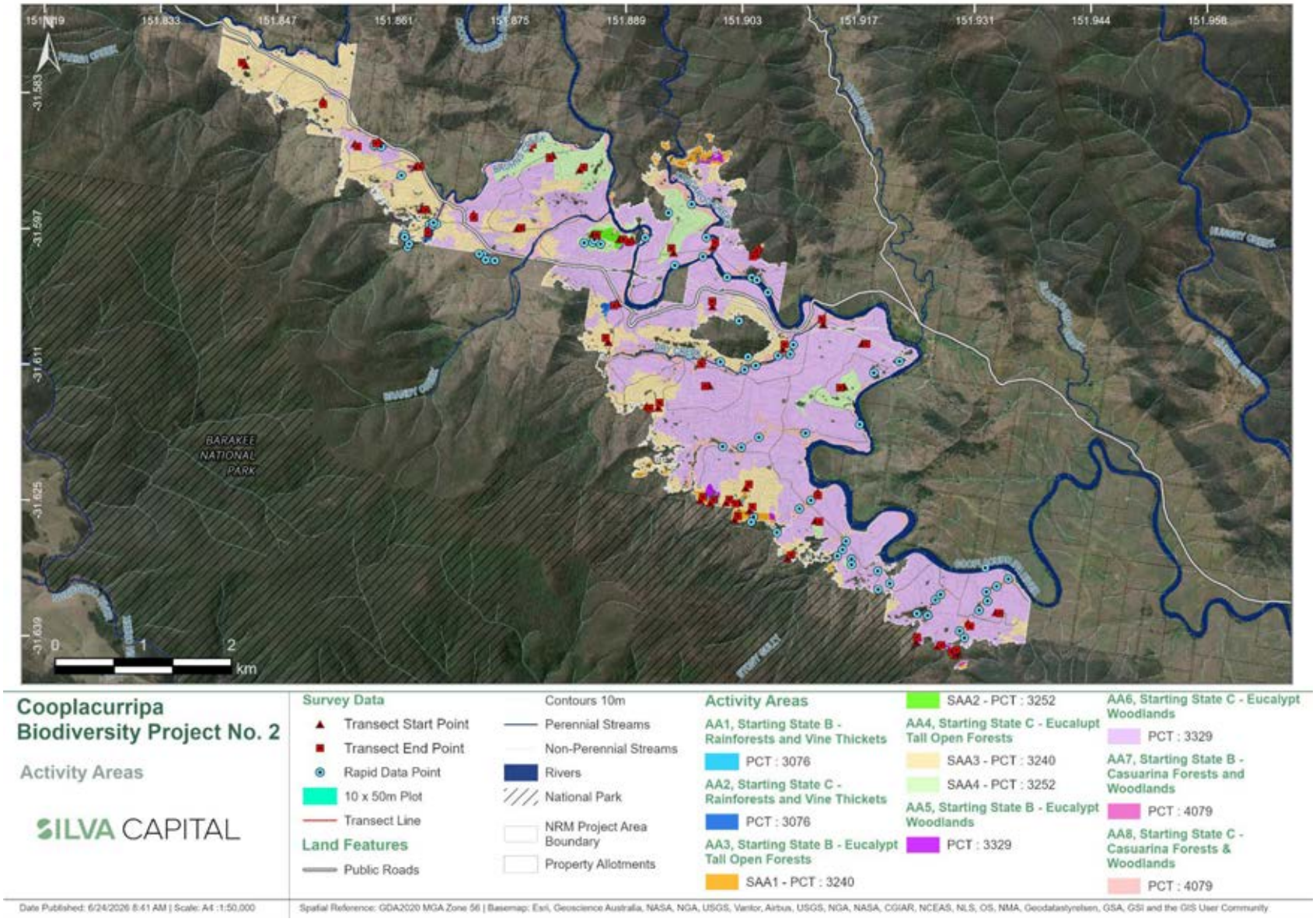
## 2.4 Excluded Areas

The residual portion of the Project Area represents 97.52 ha of land:

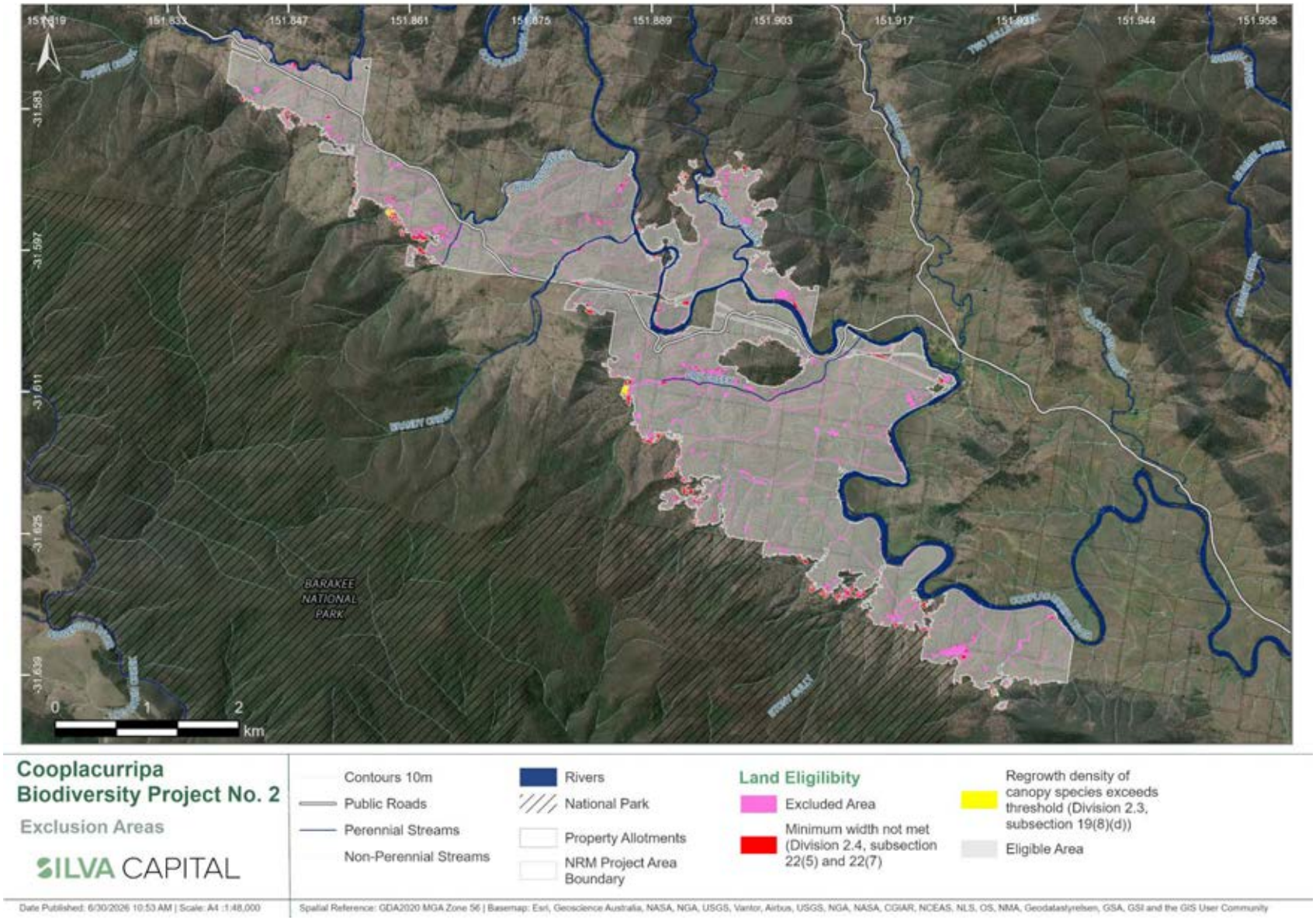
- where the stems of native trees and shrubs exceeded a diameter at breast height of 5 cm, or
- where the density of native tree saplings more than 0.5 m tall exceeds a density threshold of three trees per 10 m x 10 m area (refer to Division 2.3, Section 19(8)(d) of the Method), or
- where no environmental planting is proposed (i.e. due to the designation of tracks and firebreaks), or
- where the land has existing forest cover, or
- where minimum width requirements are not met as per Section 22(5) and 22(7) of the Method, or
- that represents excluded water (i.e. agricultural dams).

These areas have been designated exclusion areas in accordance with Division 2.4, Section 21(2) of the Method and are also shown on Figure 4.

## Figure 3: Activity Areas



## Figure 4: Exclusion Areas



# 3. Indigenous Engagement

## 3.1 Engagement Undertaken

Engagement with the Purfleet-Taree Local Aboriginal Land Council (PTLALC) has occurred and will be ongoing throughout the project. Whilst to date, there has been no Indigenous knowledge, values or Indigenous data used in the implementation of the project; if in the future Indigenous knowledge, values or Indigenous data is used in the project, it will be treated in accordance with Section 29 of the Method.

Additionally, Silva Capital and Covalent have co-designed a First Nations Engagement Protocol with the PTLALC which incorporates principles relating to cultural heritage protection, Indigenous Cultural and Intellectual Property (ICIP), and Indigenous Data Sovereignty (IDS), in reference to the following leading practice frameworks:

- United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP): sets international standards for recognising and protecting Indigenous peoples' rights. It affirms self-determination, cultural integrity, and Free, Prior and Informed Consent, ensuring communities have authority over decisions affecting their lands and heritage. Alignment with UNDRIP embeds rights-based approaches into project design and delivery, strengthening ethical governance and global best practice.
- Dhawura Ngilan Business and Investor Initiative (DNBII): supports businesses and investors to embed First Nations-led cultural heritage standards into governance, strategy, and operations. It provides practical guidance to respect for Country, uphold Free, Prior and Informed Consent, and strengthen partnerships that protect cultural heritage while building responsible, future-focused business and investment practices.
- Australian Carbon Industry Code of Conduct: sets high standards for integrity and transparency, encouraging carbon projects to engage meaningfully with Traditional Owners, respect Native Title rights, and deliver equitable, sustainable co-benefits for First Nations communities
- Indigenous Carbon Industry Network (ICIN) Guidance: emphasises Indigenous-led governance of carbon projects, and provides standards for participation, decision-making, and benefit-sharing that respect Country and strengthen livelihoods.
- NSW Caring for Country and Protecting Our Places: emphasises Aboriginal-led stewardship of land and water, empowering communities to protect sacred sites, revitalise cultural practices, and restore landscapes in ways that strengthen resilience and deepen connections to Country.
- NSW Cultural Knowledge Standards Framework: sets clear guidance for working with Aboriginal communities in ways that respect cultural heritage, protect Aboriginal Cultural Intellectual Property, and strengthen culturally safe collaboration across government, research, and industry.

As part of this collaborative approach, the project team hosted representatives from the PTLALC during the SSA as part developing a shared understanding of the practical implementation of the Method and to identify potential collaboration opportunities in future projects on the same property.

Silva Capital and Covalent have co-ordinated with Purfleet-Taree Local Aboriginal Land Council (PTLALC) to implement a co-designed cultural heritage induction and cultural heritage unexpected finds procedure that apply to any works undertaken across the property.

# 4. Site Context and Historic Drivers of Change

## 4.1 Ownership and Land Use History

Cooplacurripa is a long-standing pastoral station, first established by the Australian Agricultural Company (AACo) as far back as 1845, but certainly with intensity from the early 1860's. However, it wasn't until after the Second World War that larger areas of the station were cleared for primary production. Cooplacurripa is purported to be the largest pastoral station east of The Great Dividing Range.

AACo managed the property until 2012 when it was sold to Rifa to continue livestock operations. Rifa then sold the station to the previous owners (the Bell family) around 2019, before Silva acquired the property from the Bell Family, with that deal being finalised in September 2024.

The Phase 1 EP Project and Nature Repair Project No. 1 were registered and planting commenced in 2025. The property continues to support livestock operations in areas outside of the Phase 1 EP Project area. The Phase 2 EP Project has been registered, and site preparation for planting has commenced.

## 4.2 Historic Clearing

A review of historical world imagery basemaps accessed from the Esri World Imagery Wayback archives was undertaken in combination with on-ground inspection to assess clearing and other disturbances within the Project Area.

### 4.2.1 Historic comprehensive clearing

Aerial imagery captured on 30 January 2011 (DigitalGlobe (WV02)) (Esri, 2014) was compared with high-resolution aerial imagery captured in 2026 (supplied by Covalent). The resolution of the source imagery from 2011 represents a ground distance of 0.5 m per pixel and an accuracy of 10.2 m of true location (Esri, 2014). Both 2011 and 2026 imageries were examined at a scale of less than 1:1000, which allowed a review of canopy tree cover to be completed at a scale of 10 m x 10 m.

The imagery review demonstrates that the Project Area was comprehensively cleared at least since January 2011 (Esri, 2014). Based on the known land use history, it is widely acknowledged that much of this clearing occurred prior to 1985. The extent of woody vegetation across the Project Area remains broadly consistent and unchanged between 2011 and 2026 (i.e. 15 years from the assessment date), with the canopy layer of native trees removed and absent from at least 90% of the Project Area defined at a 10 m x 10 m scale.

### 4.2.2 Clearing of vegetation within the last 10 years

Aerial imagery captured on 10 January 2016 (DigitalGlobe (WV02)) (Esri, 2017) was examined at a scale of 1:1000, which allowed review of canopy tree cover to be completed at a scale of 10 m x 10 m. The resolution of the source imagery from 2016 represents a ground distance of 0.5 m per pixel and an accuracy of 10.2 m of true location (Esri, 2017). It shows that there has been no clearing that was undertaken in any of the activity areas within the last 10 years. The extent of woody vegetation across the Project Area remains broadly consistent and unchanged between 2016 and 2026 (i.e. 10 years from the assessment date).

### 4.2.3 Cultivation, soil disturbance and damage of native vegetation

The following activities have taken place within all activity areas since October 2025 to March 2026, as evidenced through on-ground inspections of the Project Area:

- Track establishment using a grader.
- Removal of old fence posts and fencing wire, and installation of new fencelines and gates.
- Ripping and spraying activities for site preparation for the Phase 2 EP Project.

None of these activities have caused damage to or disturbed native woody vegetation (i.e. canopy trees, native shrubs or stands of woody regeneration), as observed during on-ground inspection. The disturbance of native vegetation is limited to native groundcover plant species along planting rip lines, including patches of Blady Grass (*Imperata cylindrica*) and native pasture dominated by a low diversity of native grasses including Kangaroo Grass (*Themeda triandra*) and Barb-wire Grass (*Cymbopogon refractus*). Blady Grass is recorded in all activity areas; native pastures are recorded in AA1, AA3, AA5 and AA7, corresponding to areas in starting ecosystem condition state B.

A small proportion of the Project area has been cultivated and sown periodically since 2011, with the last sowing event likely to have taken place in late (October-November) 2022 based on historical imagery (Esri, 2024a; Esri, 2024b). These paddocks are restricted to AA6 and do not appear to have been sown within the last 3 years based on observations collected from on-ground inspections. There is no readily available documentation to confirm whether these areas were sown for pasture, or for crop. On-ground inspection of these paddocks show that the dominant species assemblage differs slightly from surrounding paddocks; that is, these paddocks were dominated by ryegrass(es) (*Lolium* spp.) and fewer pasture weed species, compared with surrounding paddocks that were dominated by Kikuyu (*Cenchrus clandestinus*), Paspalum (*Paspalum dilatatum*), Fireweed (*Senecio madagascariensis*), White Clover (*Trifolium repens*), Purpletop and verbenas (*Verbena* spp.) and Fleabane (*Conyza bonariensis*).

## 4.3 Natural Disturbances

### 4.3.1 Flooding

The Manning River basin encompasses an area of just over 8,100 km$^2$ and drains to the Tasman Sea on the NSW mid-north coast (BMT WBM Pty Ltd, 2016). The upper Manning River catchment is located within the densely vegetated coastal hinterland, with the Great Dividing Range forming the upper limit of the catchment (BMT WBM Pty Ltd, 2016). The lower catchment area comprises land downstream from Wingham and Landsdowne, with rural pastoral land on the lower floodplain downstream from Taree (BMT WBM Pty Ltd, 2016).

There was a major flooding event in 2025 which resulted in the Manning River peaking at historic levels on 21 May and reaching 6.5 m at Taree (DCCEEW, 2026; Risk Frontiers, 2025).

Prior to the 2025 record-breaking flood event, the NSW coast experienced a significant flood event in February/March 2022 brought about by high rainfall following two preceding La Niña cycles in 2020 and 2021, with major flooding recorded in many LGAs including Mid Coast LGA (MHL, 2023; NSW DCCEEW, 2024). Major flooding was recorded on the Gloucester River at Gloucester but moderate to minor flooding was recorded downstream of Gloucester along the Manning River including Mount George, Wingham, Croki, and Taree (MHL, 2023; NSW DCCEEW, 2024).

No major flooding has been reported along the Cooplacurripa and Nowendoc Rivers in the upper Manning River catchment (MHL, 2023; NSW DCCEEW, 2024) within the last 10 years. However, it is noted that there are few rainfall gauges located in the upper reaches of the Manning and Gloucester Rivers (NSW DCCEEW, 2024) and flooding events in the upper catchment areas may be under-documented compared with the coastal floodplains where it is more populated and where more infrastructure and houses are located. Flood behaviour in narrow valleys and upper tributaries are likely to be more localised and characterised by rapid rises and falls in water levels and high velocity flows.

Considering the level of flooding of the lower Manning River catchment in 2025 and 2022, it is likely that tributaries like the Nowendoc and Cooplacurripa Rivers, which are integral contributors to the Manning River catchment, would have been subject to some degree of flooding during these events but possibly not major flooding, although there is no visible evidence of recent or historical flooding based on on-ground inspections of the Project Area (i.e. such as flood level lines on river banks, or flood-damaged infrastructure).

Flooding events in the Cooplacurripa Valley are expected to mainly affect AA8 and the low-lying areas of AA6 but are unlikely to be major.

### 4.3.2 Wildfires

The most recent major wildfire that burned through the Cooplacurripa Valley occurred during the 2019/2020 “Black Summer” fires and is recorded as the Rumba complex (NSW DCCEEW, 2026). There have been no other documented wildfires that have occurred in the Project area within the last 10 years, although several smaller wildfires have been reported within the wider area over the 2025/2026 summer season.

Bushfire is a key risk factor for the Project Area; however, there were few signs of historical or recent fire damage observed within the Project Area (e.g. old burnt stumps, blackened canopy tree trunks, fire damaged infrastructure).

Fire can promote the growth and spread of Blady Grass (*Imperata cylindrica*); the species is highly flammable, can rapidly recover post-fire from an extensive rhizome network and responds well to phosphorus-rich post-fire soils. The dominance of Blady Grass in large areas of AA4 and AA6 may be an indicator of past burns (Butler, Lewis, & Chen, 2021; Redowan, et al., 2025); frequent burning to maintain open areas for cattle grazing pastures was common practice in the region.

### 4.3.3 Drought

The NSW Combined Drought Indicator (CDI) uses five drought indicators and integrates weather, climate, soil, and land-use datasets to classify overall drought conditions in NSW into the following categories (DPIRD, 2025a):

- non-drought,
- drought affected,
- drought,
- intense drought, and
- recovering.

The seasonal drought history for the Mummel Parish indicates that the Project area experienced mostly non-drought conditions within the last five years (DPIRD, 2024). Data prior to 2021 is not presented in the drought history charts (DPIRD, 2024). The region became drought-affected in winter 2023 and progressed to drought conditions in late spring 2023, recovering in June 2024 and returning to non-drought conditions by October 2024 (DPIRD, 2024). Recent seasonal drought history data indicates that drought affected areas in the Mummel Parish have been expanding since January 2026; as at the end of April 2026, parts of Project area are likely to fall within the drought-affected category (DPIRD, 2026a).

Overall drought conditions are intensifying across central and northern NSW, and the climate outlook indicates that it will continue to the end of July 2026 based on predicted continued low rainfall (DPIRD, 2026b). In the Project area, low rainfall totals in April 2026 are likely to affect on-ground conditions and are expected to impact on water storage levels and soil moisture levels on site (DPIRD, 2026b).

## 4.4 Summary of Historic Drivers of Change and Natural Disturbances

The main historic drivers of change relevant to the Project are a testament to Cooplacurripa’s long history of more than 150 years of use in primary production. Such drivers of change and their contemporary impacts are summarised in Table 6.

### Table 5: Historic drivers of change

| Historic driver | Details | Impact |
|---|---|---|
| **Land clearing** | Long history of land clearing, with the land comprehensively cleared over 15 years ago and with a large proportion having occurred before 1985, pre-dating good satellite coverage.<br>No further large-scale clearing undertaken within the last 10 years (i.e. no new grazing paddocks created or clearing for new homesteads). Extent of native woody vegetation largely consistent within all activity areas. | • The soils have been heavily compacted.<br>• Inundation by weed and pest species.<br>• Changes to natural drainage and water flows. |
| **Cultivation and soil disturbance** | From October 2025, ripping activities, track establishment activities and fence removal and installation were undertaken across all activity areas.<br>Decompaction of the soil using bulldozers fitted with rippers was undertaken during the summer months as part of site preparation for planting, to break up the soil and grassy layer. | • Creation of wide-spaced decompaction (rip-lines) following the contour of the landscapes, to maximise plant establishment success.<br>• No damage or clearing of native woody vegetation as a result of these activities.<br>• Native vegetation impacted is restricted to native ground covers in native and improved (exotic) pastures. |
| **Primary production practices, including livestock grazing and cropping** | Use of the land for primary production purposes has largely been focused on livestock, and in particular, cattle and cattle grazing. | • The soils have been heavily compacted.<br>• Changes to the nutrient content and nutrient cycling<br>• Inundation by common weeds and exotic species. |
| **Planned burning** | Frequent burning to maintain open areas for cattle grazing pastures was common practice in the region.<br>No management burns have been undertaken since acquisition of the property by Silva Capital, although planned burns will be undertaken as part of future bushfire management under a Bushfire Management Plan to be developed for the property. | • Burning promotes the growth and spread of Blady Grass (Imperata cylindrica) and Bracken Fern (Pteridium esculentum). The dominance of the former is evident across the rolling hills in the planting area and also Bracken Fern in clearings near treed margins.<br>• Large areas of Blady Grass infestations are recorded in AA4 and AA6. |

| Historic driver | Details | Impact |
|---|---|---|
| **Wildfire** | The Project Area, much like the entire Mid-Coast region, was impacted by the 2019-2020 Black Summer Bushfire event.<br>NSW NPWS fire severity mapping clearly shows large portions of the Project were affected by high severity and high intensity bushfire in the higher elevations where bushfires used the steeper topography to exhibit adverse fire behaviour. | • Alterations in the vegetation structure on the slopes due to the opening of the canopy and shrub strata.<br>• Promotion of Blady Grass (*Imperata cylindrica*) growth in the pasture areas of the Project Area. |
| **Infrastructure establishment** | There have been a total of 9 homesteads and associated infrastructure (access tracks, fences, transmission line etc) built on the property as well as a large council-owned road that traverses east-west through the midpoint of the Project Area. | • Dust is readily generated by the council road.<br>• Spread and introduction of weed and pest species |

## 4.5 Threats to the Project Outcome

There were a number of potential threats identified during the SSA that pose a risk to the Project outcome being achieved, these were largely in relation to:

- weeds and invasive species out competing the plantings,
- pest species destroying or eating plantings, and
- extreme weather events and associated risks such as bushfire, flooding, drought and storms may destroy plantings or impact the ability to undertake necessary Project activities and adhere to the schedule.

All potential threats, except for bushfire and drought, have been assessed as having a low risk to achieving the Project outcome when the relevant measures are applied. Given the high bushfire susceptibility of the area, risk remains moderate after implementation of risk reduction measures including a comprehensive Bushfire Mitigation Works Schedule (BMWS) (CLA, 2025). Drought risk is most significant at the time of establishment and the years immediately after planting. Whilst drought may impact the early years of the project, with the implementation of mitigation measures, it is unlikely to impact the ultimate achievement of the project outcome.

A more in-depth description of the threats and associated mitigation / management measures is provided below.

### 4.5.1 Weeds

Several weeds were identified on the site during field surveys. Weeds have the potential to out-compete the planted species if not properly managed. However, it is expected that the residual risk to achieving the Project outcomes would be low if the proposed mitigation measures are implemented.

Priority weeds for the site are provided in Table 7 below.

**Table 6: Priority weeds for the site**

| Weed | Mitigation and management measures | Residual risk |
|---|---|---|
| **Blackberry bush (*Rubus fruticosus*)** | Biomass reduction and targeted herbicide treatment. | **Low** – whilst sighted in the Project Area, it is representative and typical for the overall landscape. There were no large infestations sighted nor was the weed identified as widespread. It is expected to be suitably managed with the proposed measures. |
| **Kikuyu (*Cenchrus clandestinus*)** | Suppressing Kikuyu Grass growth within planted rows with chemical treatment and maintaining Kikuya Grass along the inter-rows. | **Low** – whilst the weed is widespread throughout the Project Area as it was initially planted as a fast-growing groundcover species, it is expected to be suitably managed with the proposed measures. |
| **Other invasive weed species** | Early identification and use of targeted biomass reduction through use of mechanical and herbicide treatment to keep the weed burden low, especially in the high pasture / modified landscapes. | **Low** – it is expected to be suitably managed with the proposed measures. |

### 4.5.2 Pests

Pest species have the potential to kill and destroy planting by way of eating, trampling or spreading weeds and other harmful materials into the Activity Areas.

Three pests of priority concern have been identified within the Project area:

- Feral Pig (*Sus scrofa*),
- Feral rabbit (*Oryctolagus cuniculus*), and
- Feral hare (*Lepus capensis*).

These species are to be managed using fencing and targeted humane control throughout the year. Alignment of methods and strategies with neighbouring properties, especially from National Parks & Wildlife Service (NPWS) and State Forest land, for a collaborative pest species program of works would be utilised where practical and feasible.

With the proposed measures, it is expected that the residual risk to achieving the Project outcomes from pest species would be low.

### 4.5.3 Extreme Weather Events and Risks

The site is exposed to a number of natural extreme weather events and risks by nature of being a large, variable and rural environment. The primary weather events and risks of note for the Project and associated mitigation and management measures are provided in Table 8 below.

**Table 7: Extreme weather events / risks and associated mitigation measures**

| Weather event | Risk | Mitigation and management measures | Residual risk |
|---|---|---|---|
| **Bushfire** | • Being surrounded by significant amounts of woodlands and vegetation that carry large amounts of fuel for bushfires<br>• Additional fuel sources being added to the environment through plantings<br>• Rural location of the site making access and response times for bushfires challenging | A comprehensive Bushfire Mitigation Works Schedule (BMWS) (CLA, 2025) has already been developed for property. The BMWS uses site-based assessment of bushfire potential (fuel loads, structure, fire regime departures and other thresholds) and recommends mitigation strategies matched to that risk profile. | Moderate |
| **Drought** | • Reduced water availability resulting in reduced survival and growth of plantings<br>• Increased herbivory by pest animals resulting from a reduction of the availability of alternative food sources. | • Early decompaction to retain moisture in rip-line<br>• Use of water crystals to improve soil moisture retention during planting<br>• Overabundant native and vertebrate pest species control to reduce pressure on system<br>• Watering at the time of planting and early in the establishment<br>• Infill planting in wetter years in the case of dieback. | Moderate |
| **Storms** | Storms have the potential to bring strong winds, lightning and heavy rainfall which may present threats to infrastructure and equipment stored on the Site as well as the ability to destroy young plantings and vegetation. | • All infrastructure would be installed/constructed to the relevant Australian Standard.<br>• Equipment would be stored in allocated areas, reasonably protected from the elements.<br>• A maintenance schedule would:<br>• Allow for infrastructure to be maintained and structurally sound<br>• Repair infrastructure where required<br>• Ensure replanting is undertaken where necessary | Low |
| **Flooding** | • With several perennial and non-perennial streams running through the site, there is potential significant rainfall to flood different portions of the site, potentially 'drowning' some of the plantings<br>• Flooding has the potential to hold up works, such as ripping and planting<br>• Flooding may render access tracks either temporarily or permanently unusable. | • Temporary access tracks or relocation of tracks would be investigated and used where appropriate<br>• A maintenance schedule would:<br>• Allow for infrastructure to be maintained and structurally sound<br>• Repair infrastructure where required<br>• Ensure replanting is undertaken where necessary | Low |

### 4.5.4 Threat impacts to the surrounding landscape

The Project Area is surrounded by large areas of intact native vegetation and species habitat occurring within both freehold and reserve lands. The Project will result in the reafforestation of currently cleared land across Cooplacurripa Valley, and this will alter the bushfire risk of Project Area and surrounding areas.

The mitigation works proposed in the BMWS (CLA, 2025) aims to mitigate fuel risks on carbon stock assets, infrastructure and surrounding biodiversity by responsibly managing fuel loads (primarily surface and near-surface fine fuels) and ignition points (including slashing, pruning and prescribed burn activities in specified locations), and maintaining fire-fighting readiness via upkeep of fire management infrastructure (such as well-connected fire track and trail network, and signage to water resources).

None of these mitigation works are expected to conflict with the Project outcomes being achieved.

## 4.6 Climate Change Considerations

### 4.6.1 Climate change projections affecting the Project area

The Climate Change in Australia – Climate Projections & Analogues tool (CSIRO and Bureau of Meteorology, 2025) and the Interactive climate change projections map (NSW Government, 2024) were investigated to access projected climate changes and application-ready future climate data (applied to observational data) to create a regional summary on future climate projections.

Projected regional climate change outcomes for the East Coast South sub-cluster of Natural Resource Management (NRM) regions are summarised below:

- Average temperatures will continue to increase in all seasons (very high confidence). There is very high confidence in continued substantial increases in projected mean, maximum and minimum temperatures in line with our understanding of the effect of further increases in greenhouse gas concentrations.
- More hot days and warm spells are projected with very high confidence. Fewer frosts are projected with high confidence.
- Decreases in winter rainfall is projected with medium confidence. Other changes are possible but unclear.
- Increased intensity of extreme rainfall events is projected, with high confidence.
- A harsher fire-weather climate in the future (high confidence).
- On an annual and a decadal basis, natural variability in the climate system can act to either mask or enhance any long-term human induced trend, particularly in the next 20 years and for rainfall.

Using the Climate Analogues projection tool[1] (CSIRO and Bureau of Meteorology, 2025) for Taree (as having the most similar vegetation groups to the Project area) and applying an emissions scenario of Representative Concentration Pathway (RCP) 4.5, it is projected that Cooplacurripa will have a similar climate in 2050 to the current climate of other northern locations Kempsey, Caboolture, Brisbane, Atherton, Grafton, Gold Coast, and Lismore.

The NSW and Australian Regional Climate Modelling project (NARCliM) 2.0 projections (NSW Government, 2024) provide nation-leading climate model data that span the range of plausible future changes in climate for south-east Australia at a 4 km resolution, and for the broader Australasian region at a 20 km resolution.

Key findings for Hunter region and Cooplacurripa area are listed below:

[1] The climate analogues tool (CSIRO and Bureau of Meteorology, 2025) matches the proposed future climate of a location of interest with the current climate experienced in another location using annual average rainfall and maximum temperature.

- Warmer average temperatures: 1 - 4.5 degrees increase in Cooplacurripa.
- Hot days to become more frequent, cold days to decrease.
- Rainfall to remain variable.
- Severe fire weather to increase.

A summary of projected climate change effects and impacts are presented in Table 9.

**Table 8: Summary of potential climate change impacts to the Project area**

| Climate indicator | Effect | Impact |
|---|---|---|
| **Temperature** | Temperatures will increase during all seasons, including for mean, maximum and minimums (very high confidence).<br>There will be an increase in the number of extreme hot days and fewer frosts and cold days (very high confidence). | Heat stress can cause die-off and die-back in new and existing plantings.<br>Scheduling disruption due to extreme heat. |
| **Rainfall** | Decrease in winter rainfall (medium confidence).<br>Increase in intensity of extreme rainfall events (high confidence.<br>Variability in rainfall remains likely. | Potential reduction in rainfall in the growing seasons.<br>Scheduling disruption from extreme rainfall events. |
| **Fire weather** | Harsh and sever fire-weather to increase | Destruction of existing and new plantings, with areas of higher elevation at greater risk. |

## 4.7 Other Relevant Features

### 4.7.1 Threatened species or ecological communities

No threatened species or ecological communities were recorded within the Project Area.

A search of the Commonwealth DCCEEW PMST (DCCEEW, 2025a) was undertaken on 23 June 2026 to conservatively determine what threatened species and threatened ecological communities (TEC) listed under the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) are modelled to occur within or surrounding the Project Area. The complete PMST report can be found in Appendix C: EPBC Act Protected Matters Report.

A search of the BioNet Atlas of NSW Wildlife (NSW DCCEEW, 2026a) was also undertaken to gain an understanding of the threatened species listed under both the EPBC Act and NSW *Biodiversity Conservation Act 2016* (BC Act) that have been recorded within 10 km of the Project Area.

#### Likelihood of occurrence

##### Threatened species

Approximately 89 threatened or migratory species have been recorded or are predicted to occur within 10 km of the Project Area, comprising 70 fauna species and 19 flora species. Table 10 summarises the species results and assesses the likelihood of their occurrence within the activity areas.

### Fauna species

Many of the threatened fauna with numerous records within 10 km of the Project Area are recorded in forested areas in adjacent reserves and freehold land and rely on well-connected and intact habitats for breeding, roosting and foraging. This includes species like Northern long-nosed potoroo (*Potorous tridactylus tridactylus*), Yellow-bellied Glider (*Petaurus australis*) and Southern Greater Glider (*Petauroides volans*). The Project does not currently support expansive areas of vegetation and as such, these species are unlikely to be encountered within the planting areas. Smaller woodland species could occur on forested margins adjacent to the Project Area and may move in and out of the planting areas during foraging, but are likely to be limited to the boundaries of the Project Area and are unlikely to nest or roost within the Project Area.

Highly mobile and wide-ranging species like raptors, South-eastern Glossy Black-Cockatoo (*Calyptorhynchus lathami lathami*), and microchiropteran bats have been recorded within 10 km of the Project Area and could occur within the Project Area or fly over from time to time as part of movement within the broader area, but their use of the habitats within the Project Area for foraging or roosting is also unlikely since much of the canopy and understorey habitat components influencing foraging and roosting resources are missing from expansive areas of the Project Area.

Whilst species like Koala (*Phascolarctos cinereus*) and Spotted-tailed Quoll (*Dasyurus maculatus maculatus*) have been sighted on the property and can move across cleared landscapes, none were recorded within the Project Area, and the scale of cleared land across the Project Area makes it unlikely that these species will be encountered within proposed planting areas.

The Cooplacurripa River itself is known to provide habitat for the Manning River Helmeted Turtle (*Myuchelys purvisi*), and as such the Manning River Helmeted Turtle is unlikely to be found in planting areas. The Project will not draw water from the river for planting establishment; in drought conditions, water may be drawn from the river for planting establishment. The amount of water required for plantings is significantly less than the extraction entitlement for the property to minimise impacts on the Manning River Helmeted Turtle and is unlikely to result in significantly reduced baseline flows.

### Flora species

There are very few threatened flora species recorded within 10 km of the Project Area. Much of the threatened flora predicted to occur within 10 km of the Project Area are either associated with habitats that do not occur within the Project Area or are associated with a highly restricted distribution that does not overlap with the Project Area.

Numerous records for Scrub Turpentine (*Rhodamnia rubescens*) have been recorded within 10 km of the Project Area but are associated with rainforest and rainforest margin habitats, which do not occur within the Project Area.

The low diversity native derived grasslands that occur on the elevated slopes on the margins of the Project Area could potentially support occurrences of grassland flora species like Austral Toadflax (*Thesium australe*), although none have been recorded within 10 km of the Project Area.

The reafforestation of the Project Area will benefit threatened species in the locality through improved connectivity and the expansion of forest and woodland habitats in the long term.

## Threatened ecological communities

No TECs were recorded within the Project Area. PCT 3076 is associated with several rainforest TECs including:

- Lower Hunter Valley Dry Rainforest in the Sydney Basin and NSW North Coast Bioregions (Vulnerable under the BC Act),
- Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions (Endangered under the BC Act), and

- Lowland Rainforest of Subtropical Australia (Critically endangered under the EPBC Act).

Although PCT 3076 is likely to have been historically present within the Project Area, it does not currently occur within the Project Area. The Project aims to reinstate PCT 3076 through environmental planting activities.

## Table 9: Likelihood of occurrence of threatened species within the Project Area

| Family | Scientific name | Common name | BC Act | EPBC Act | Likelihood of occurrence in activity area |
|---|---|---|---|---|---|
| **Frogs** | | | | | |
| Hylidae | *Litoria booroolongensis* | Booroolong Frog | N/A | EN | Unlikely |
| Hylidae | *Litoria daviesae* | Davies' Tree Frog | VU | VU | Unlikely |
| Myobatrachidae | *Mixophyes balbus* | Stuttering Frog | EN | VU | Unlikely |
| Myobatrachidae | *Philoria sphagnicola* | Sphagnum Frog | N/A | VU | Negligible |
| Emballonuridae | *Saccolaimus flaviventris* | Yellow-bellied Sheathtail-bat | VU | N/A | Potential - foraging only |
| **Bats** | | | | | |
| Miniopteridae | *Miniopterus australis* | Little Bent-winged Bat | VU | N/A | Unlikely |
| Miniopteridae | *Miniopterus orianae oceanensis* | Large Bent-winged Bat | VU | N/A | Unlikely |
| Molossidae | *Micronomus norfolkensis* | Eastern Coastal Free-tailed Bat | VU | N/A | Unlikely |
| Pteropodidae | *Pteropus poliocephalus* | Grey-headed Flying-fox | N/A | VU | Unlikely |
| Vespertilionidae | *Chalinolobus dwyeri* | Large-eared Pied Bat, Large Pied Bat | N/A | EN | Unlikely |
| Vespertilionidae | *Falsistrellus tasmaniensis* | Eastern False Pipistrelle | VU | N/A | Unlikely |
| Vespertilionidae | *Myotis macropus* | Southern Myotis | VU | N/A | Potential - foraging only |
| Vespertilionidae | *Nyctophilus corbeni* | Corben's Long-eared Bat, South-eastern Long-eared Bat | N/A | VU | Negligible |
| Vespertilionidae | *Phoniscus papuensis* | Golden-tipped Bat | VU | N/A | Unlikely |

| Family | Scientific name | Common name | BC Act | EPBC Act | Likelihood of occurrence in activity area |
|---|---|---|---|---|---|
| Vespertilionidae | *Scoteanax rueppellii* | Greater Broad-nosed Bat | VU | N/A | Unlikely |
| **Birds** | | | | | |
| Acanthizidae | *Aphelocephala leucopsis* | Southern Whiteface | N/A | VU | Negligible |
| Accipitridae | *Circus assimilis* | Spotted Harrier | VU | N/A | Potential - foraging only |
| Accipitridae | *Erythrotriorchis radiatus* | Red Goshawk | N/A | EN | Negligible |
| Accipitridae | *Haliaeetus leucogaster* | White-bellied Sea-Eagle | VU | N/A | Unlikely |
| Accipitridae | *Hieraaetus morphnoides* | Little Eagle | VU | N/A | Potential - foraging only |
| Apodidae | *Apus pacificus* | Fork-tailed Swift | N/A | Migratory | Negligible |
| Apodidae | *Hirundapus caudacutus* | White-throated Needletail | VU | VU | Negligible |
| Ardeidae | *Botaurus poiciloptilus* | Australasian Bittern | N/A | EN | Negligible |
| Artamidae | *Artamus cyanopterus cyanopterus* | Dusky Woodswallow | VU | N/A | Unlikely |
| Atrichornithidae | *Atrichornis rufescens* | Rufous Scrub-bird | N/A | EN | Negligible |
| Cacatuidae | *Calyptorhynchus lathami lathami* | South-eastern Glossy Black-Cockatoo | VU | VU | Potential - foraging only |
| Climacteridae | *Climacteris picumnus victoriae* | Brown Treecreeper (south-eastern) | N/A | VU | Unlikely |
| Columbidae | *Ptilinopus magnificus* | Wompoo Fruit-Dove | VU | N/A | Negligible |
| Cuculidae | *Cuculus optatus* | Oriental Cuckoo, Horsfield's Cuckoo | N/A | Migratory | Negligible |
| Estrildidae | *Stagonopleura guttata* | Diamond Firetail | N/A | VU | Unlikely |

| Family | Scientific name | Common name | BC Act | EPBC Act | Likelihood of occurrence in activity area |
|---|---|---|---|---|---|
| Falconidae | *Falco hypoleucos* | Grey Falcon | N/A | VU | Negligible |
| Meliphagidae | *Anthochaera phrygia* | Regent Honeyeater | N/A | CE | Negligible |
| Meliphagidae | *Grantiella picta* | Painted Honeyeater | N/A | VU | Negligible |
| Motacillidae | *Motacilla flava* | Yellow Wagtail | N/A | Migratory | Negligible |
| Neosittidae | *Daphoenositta chrysoptera* | Varied Sittella | VU | N/A | Negligible |
| Pandionidae | *Pandion haliaetus* | Osprey | N/A | Migratory | Negligible |
| Petroicidae | *Melanodryas cucullata cucullata* | South-eastern Hooded Robin, Hooded Robin (south-eastern) | N/A | EN | Negligible |
| Petroicidae | *Petroica boodang* | Scarlet Robin | VU | N/A | Unlikely |
| Petroicidae | *Petroica phoenicea* | Flame Robin | VU | N/A | Unlikely |
| Psittacidae | *Lathamus discolor* | Swift Parrot | N/A | CE | Unlikely |
| Psittacidae | *Neophema chrysostoma* | Blue-winged Parrot | N/A | VU | Unlikely |
| Rostratulidae | *Rostratula australis* | Australian Painted Snipe | N/A | EN | Negligible |
| Scolopacidae | *Actitis hypoleucos* | Common Sandpiper | N/A | Migratory | Negligible |
| Scolopacidae | *Calidris acuminata* | Sharp-tailed Sandpiper | N/A | VU | Negligible |
| Scolopacidae | *Calidris ferruginea* | Curlew Sandpiper | N/A | CE | Negligible |
| Scolopacidae | *Calidris melanotos* | Pectoral Sandpiper | N/A | Migratory | Negligible |

| Family | Scientific name | Common name | BC Act | EPBC Act | Likelihood of occurrence in activity area |
|---|---|---|---|---|---|
| Scolopacidae | *Gallinago hardwickii* | Latham's Snipe, Japanese Snipe | N/A | VU | Negligible |
| Strigidae | *Ninox connivens* | Barking Owl | VU | N/A | Unlikely |
| Strigidae | *Ninox strenua* | Powerful Owl | VU | N/A | Unlikely |
| Tytonidae | *Tyto novaehollandiae* | Masked Owl | VU | N/A | Unlikely |
| Tytonidae | *Tyto tenebricosa* | Sooty Owl | VU | N/A | Unlikely |
| **Crustaceans** | | | | | |
| Parastacidae | *Euastacus maccai* | Terrestrial Crayfish | N/A | EN | Negligible |
| Parastacidae | *Euastacus spinichelatus* | Small Crayfish | N/A | EN | Negligible |
| **Mammals** | | | | | |
| Dasyuridae | *Dasyurus maculatus maculatus (SE mainland population)* | Spotted-tail Quoll, Spot-tailed Quoll, Tiger Quoll (southeastern mainland population) | VU | EN | Potential |
| Dasyuridae | *Phascogale tapoatafa* | Brush-tailed Phascogale | VU | N/A | Unlikely |
| Macropodidae | *Notamacropus parma* | Parma Wallaby | VU | VU | Unlikely |
| Macropodidae | *Petrogale penicillata* | Brush-tailed Rock-wallaby | N/A | VU | Negligible |
| Petauridae | *Petaurus australis* | Yellow-bellied Glider | VU | VU | Unlikely |
| Petauridae | *Petaurus australis australis* | Yellow-bellied Glider (south-eastern) | N/A | VU | Negligible |
| Potoroidae | *Aepyprymnus rufescens* | Rufous Bettong | VU | N/A | Unlikely |

| Family | Scientific name | Common name | BC Act | EPBC Act | Likelihood of occurrence in activity area |
|---|---|---|---|---|---|
| Potoroidae | *Potorous tridactylus tridactylus* | Northern long-nosed potoroo | VU | VU | Unlikely |
| Pseudocheiridae | *Petauroides volans* | Southern Greater Glider | EN | EN | Unlikely |
| Phascolarctidae | *Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)* | Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) | EN | EN | Potential |
| **Reptiles** | | | | | |
| Carphodactylidae | *Saltuarius moritzi* | New England Leaf-tailed Gecko, Moritz's Leaf-tailed Gecko | N/A | EN | Negligible |
| Chelidae | *Myuchelys purvisi* | Manning River Helmeted Turtle, Purvis' Turtle | EN | EN | Unlikely |
| Elapidae | *Hoplocephalus stephensii* | Stephens' Banded Snake | VU | N/A | Unlikely |
| Scincidae | *Coeranoscincus reticulatus* | Three-toed Snake-tooth Skink | N/A | VU | Negligible |
| Scincidae | *Eulamprus kosciuskoi* | Alpine Water Skink | N/A | VU | Negligible |
| Muridae | *Pseudomys novaehollandiae* | Pookila, New Holland Mouse | N/A | VU | Negligible |
| Muridae | *Pseudomys oralis* | Hastings River Mouse, Koontoo | N/A | EN | Unlikely |
| **Herbs and Forbs** | | | | | |
| Apocynaceae | *Cynanchum elegans* | White-flowered Wax Plant | EN | EN | Unlikely |
| Apocynaceae | *Vincetoxicum woollsii* (syn. *Tylophora woollsii*) | Cryptic Forest Twiner | N/A | EN | Negligible |
| Lamiaceae | *Coleus nitidus* (syn. *Plectranthus nitidus*) | Nightcap Plectranthus, Silver Plectranthus | N/A | EN | Negligible |

| Family | Scientific name | Common name | BC Act | EPBC Act | Likelihood of occurrence in activity area |
|---|---|---|---|---|---|
| Orobanchaceae | *Euphrasia arguta* | | N/A | CE | Unlikely |
| Polygonaceae | *Persicaria elatior* | Knotweed, Tall Knotweed | N/A | VU | Unlikely |
| Santalaceae | *Thesium australe* | Austral Toadflax, Toadflax | N/A | VU | Potential |
| **Grasses** | | | | | |
| Poaceae | *Arthraxon hispidus* | Hairy-joint Grass | N/A | VU | Negligible |
| Poaceae | *Dichanthium setosum* | bluegrass | N/A | VU | Unlikely |
| **Orchids** | | | | | |
| Orchidaceae | *Cryptostylis hunteriana* | Leafless Tongue-orchid | N/A | VU | Unlikely |
| Orchidaceae | *Pterostylis elegans* | Elegant Greenhood | VU | N/A | Negligible |
| Orchidaceae | *Rhizanthella slateri* | Eastern Underground Orchid | N/A | EN | Unlikely |
| **Shrubs** | | | | | |
| Haloragaceae | *Haloragis exalata subsp. velutina* | Tall Velvet Sea-berry | N/A | VU | Negligible |
| **Trees** | | | | | |
| Myrtaceae | *Callistemon pungens* | | N/A | VU | Negligible |
| Myrtaceae | *Rhodamnia rubescens* | Scrub Turpentine | CE | CE | Negligible |
| Myrtaceae | *Rhodomyrtus psidioides* | Native Guava | N/A | CE | Unlikely |
| Myrtaceae | *Eucalyptus glaucina* | Slaty Red Gum | N/A | VU | Negligible |

| Family | Scientific name | Common name | BC Act | EPBC Act | Likelihood of occurrence in activity area |
|---|---|---|---|---|---|
| Myrtaceae | *Eucalyptus largeana* | Craven Grey Box | EN | EN | Negligible |
| Myrtaceae | *Eucalyptus nicholii* | Narrow-leaved Peppermint, Narrow-leaved Black Peppermint | N/A | VU | Negligible |
| Myrtaceae | *Syzygium paniculatum* | Magenta Lilly Pilly, Magenta Cherry, Daguba, Scrub Cherry, Creek Lilly Pilly, Brush Cherry | N/A | VU | Negligible |

### 4.7.2 Surrounding hydrological features

The main hydrological features recorded in the Project Area that could affect or be affected by the Project activities include the following surface features:

- Cooplacurripa and Kangaroo Rivers, representing perennial waterways and a (reasonably) consistent water supply. Cooplacurripa River is a significant contributor to the Manning River system.
- A number of 3rd and 4th order ephemeral/intermittent tributaries of the Cooplacurripa River, located on moderate to steep slopes. These drainages can be characterised by rapid run-off during heavy rainfall events.
- A number of farm dams, located around the Project area, providing water storage capacity on site. The condition of the dams is not known.

The named streams that intersect with the Project are described in Table 11 and shown in Figure 5.

A search of the Commonwealth DCCEEW Protected Matters Search Tool (PMST) was undertaken on 25 February 2026 and confirmed that no Wetlands of International Importance (RAMSAR wetlands) were present within the Project Area.

**Table 10: Relevant hydrological features**

| Stream name | Flow | Strahler order | Drainage |
|---|---|---|---|
| **Cooplacurripa River** | Perennial | 6 | Drains from the north-west of the Project area to the south-east, into the Nowendoc River beyond the Project Area. |
| **Kangaroo Creek** | Perennial | 5 | Drains from the north west to the south east, flows into Cooplacurripa River within the Project area. |
| **Bruhns Creek** | Non-perennial | 4 and 3 | Drains from the south west to the north east before joining Cooplacurripa River just outside of the Project area. Largely runs along the perimeter of the north western boundary of the Project area. |
| **Parish Creek** | Non-perennial | 4 | Drains from west to east along the perimeter in the north western corner of the Project area, draining into Wards Creek before joining the Cooplacurripa River. |
| **Brandy Creek** | Non-perennial | 3 | Drains from the south west to north east, into the Cooplacurripa River. |
| **Dry Creek** | Non-perennial | 3 | Drains from the south west to north east, into the Cooplacurripa River. |
| **Stony Gully** | Non-perennial | 3 | Drains from the south west to north east, into the Cooplacurripa River in the south eastern portion of the Project area. |

### 4.7.3 Signs of natural regeneration

Natural regeneration of native tree and shrub species was rare across the Project Area and generally restricted to the periphery of the Project Area on steep hills and slopes, at the interface of the activity area boundaries with remnant vegetation outside of the Project Area.

Areas containing native tree regeneration (of trees more than 0.5 m tall) at a density greater than 3 trees per 10 $m^2$ were excluded from the activity areas (see Section 2.4 of this SAR and Figure 4).

Areas of tree regeneration (where stem diameter at breast height is less than 5cm) were very rare and limited to a few scattered individuals and seedlings comprising less than 1% cover (of sampling plots) with an approximate age of less than 3 years. Species are detailed in Table 12 below.

Given the scale of the Project Area, it was impractical to identify all instances of natural regeneration. Permanent sampling plot data was used to inform the assessment of tree regeneration. The site is a uniform landscape of exotic and native pasture which has been managed and actively grazed until the commencement of the project. Comparison of present-day aerial imagery with historical satellite imagery (see Appendix G: Historic Satellite Imagery) shows that cleared areas and tree cover has been stable and largely unchanged over the last 15 years. Sampling plots are considered representative in composition and condition of at least 90% of their respective activity areas. For example, photos from sampling plots T23, T6, T11 (Appendix F: Photos of permanent sampling plots) demonstrate the nature of the majority of the exotic pastures in their respective activity areas, whilst photos from sampling plots T21, T38, T40 (Appendix F: Photos of permanent sampling plots) demonstrate the nature of most of the low diversity native pastures occurring in their respective activity areas.

**Table 11: Details of natural regeneration in activity areas**

| Activity Area | Species | Common name | Location and number of species |
|---|---|---|---|
| **AA1** | *Angophora floribunda* | Rough-barked Apple | 1 observed in 3076B_T21 |
| **AA2** | *Eucalyptus tereticornis* | Forest Red Gum | 1 observed in 3076C_T23 |
| **AA3** | *Eucalyptus tereticornis* | Forest Red Gum | 1 observed in 3420B_T42 |
| **AA4** | - | - | |
| **AA5** | *Eucalyptus tereticornis*<br><br>*Eucalyptus eugenioides* | Forest Red Gum<br><br>Thin-leaved Stringybark | 1 observed in 3329B_T36<br>1 observed in 3329B_T45<br>1 observed in 3329B_T45 |
| **AA6** | - | - | - |
| **AA7** | - | - | - |
| **AA8** | - | - | - |

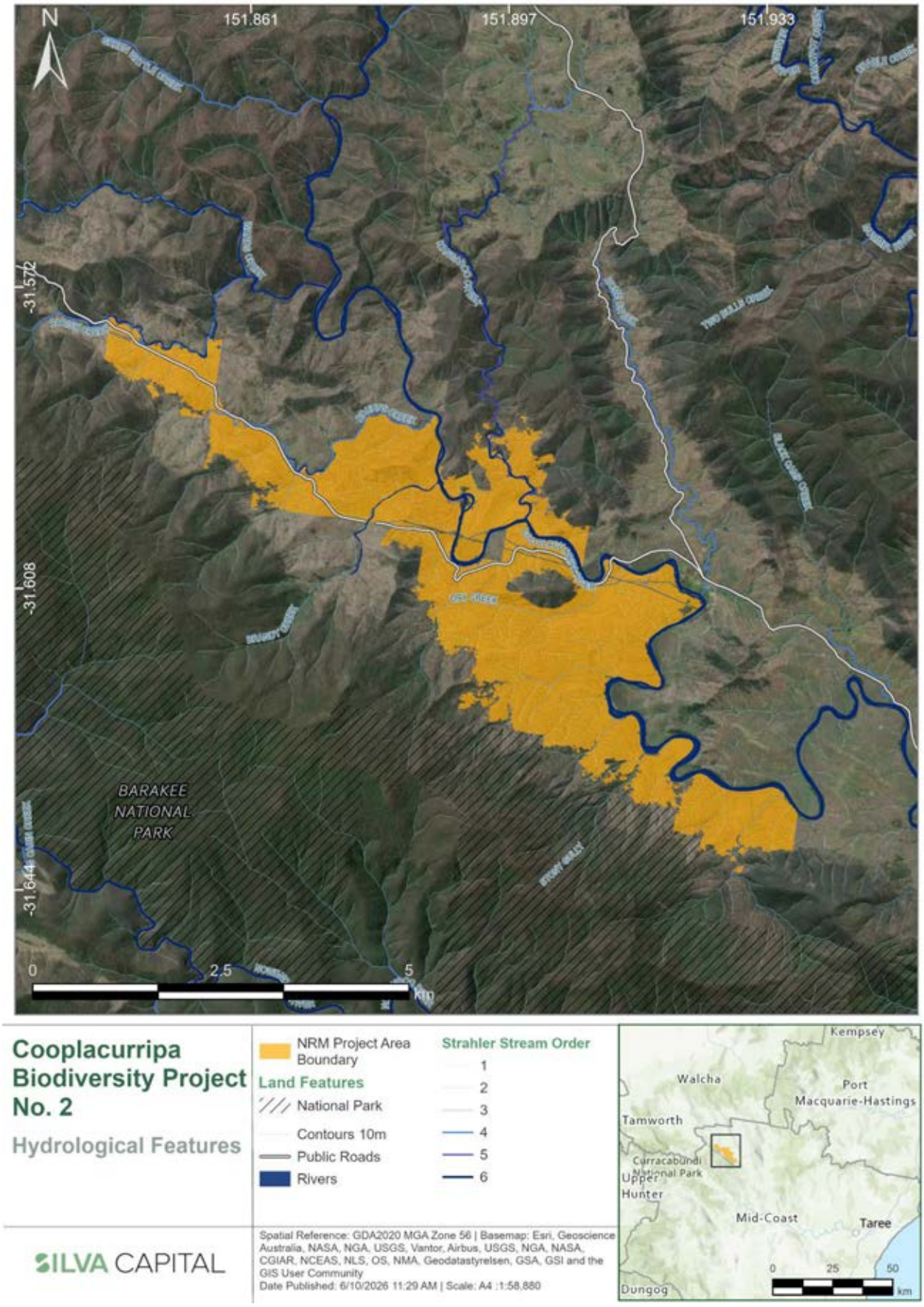
### 4.7.4 Legal Context

Identification of covenants and other legal encumbrances were informed by:

- search of the applicable land title register;
- search of any applicable state or territory register relating to cultural heritage;
- search of the Register under the *Carbon Farming Initiative Act 2011*; and
- a signed statement from the owner of the land.

Conduct of these searches identified that there is one legal encumbrance applicable to the entirety of the Project: AU512816 Mortgage to Commonwealth Bank of Australia.

## Figure 5: Hydrological Features



# 5. Starting Ecosystem Condition State Assessment

## 5.1 Identifying and Assigning Reference Ecosystems

### 5.1.1 Method

Reference ecosystems were identified for each activity area as part of the SSA, in accordance with Section 46 of the Method. The assessment was undertaken at a maximum scale of 3 ha, with a minimum width of 50 metres for linear features. The prescribed vegetation map, accessed through the Platform for Land and Nature Repair (PLANR), was reviewed.

There was a paucity of remnant or relic native floristics that could be used to validate the prescribed vegetation map. This is because expansive areas of the Project Area (being largely situated in the main Cooplacurripa valley) was cleared prior to 1985 and sown to exotic pasture that is dominated by Kikuyu (*Pennisetum clandestinum*), a highly productive warm-season perennial grass, and enriched with White Clover (*Trifolium repens*), a palatable and highly nutritious pasture legume.

Considering this, the pre-1750 (pre-clearing) NSW SVTM was reviewed in combination with other desktop information (such as topography and elevation data, landscape position, waterways, aspect, geology and surrounding extant vegetation more widely) to identify likely historic ecosystems for the Project Area that could be suitable to be used as reference ecosystems for the Project. This information was used as the basis for subsequent vegetation validation surveys.

Field validation surveys were undertaken over the following dates: 27-30 October 2025 and 24-26 November 2025. Rapid point data survey was undertaken (recording dominant canopy, midstorey and groundcover species at randomised point locations) and more generalised mapping notes were recorded to collect data regarding PCT classification and distribution across the Project Area. In undertaking field validation surveys, consideration was given to the following:

- Occurrence of remnant or relic native vegetation retained (albeit sparse), including scattered trees, shrubs, and vines and their position in the landscape (i.e. ridge crests, slopes, drainage lines).
- Soil characteristics, particularly areas where humic or organic accumulation and higher soil moisture is evident.
- Areas of rock outcropping along narrow or incised side or hillslope drains or along ridge crests.
- Characteristics of surrounding remnant vegetation outside of the Project Area.
- That localised dominance of native groundcover Blady Grass (*Imperata cylindrica*) or Bracken Fern (*Pteridium esculentum*) may be an artefact of historic burning rather than indicative of a PCT.

PCT classification and linework was updated accordingly and used to inform the final stratification of the Project Area into activity areas and sub-activity areas, as well as determine benchmark values for the Project.

### 5.1.2 Plant Community Types (PCT) Assignment

The pre-1750 (pre-clearing) SVTM map suggests that the Project Area would have once supported up to 16 PCTs reflecting a range of dry and wet sclerophyll forests, grassy woodlands, riverine forests, and rainforests. Notably, the pre-1750 (pre-clearing) SVTM map models eight different rainforest PCTs across the Project Area representing a variety of dry, warm temperate and subtropical rainforest types. The historical occurrence of rainforest vegetation in the Cooplacurripa valley is likely to be much simpler than this, and likely to have been restricted to dry rainforest types in sheltered pockets in narrow drainage lines on mid- to lower- slopes above the Cooplacurripa River.

Topographically, Cooplacurripa valley is aligned broadly in an east-west direction and is characterised by rolling hills, narrow ridge crests, moderately long and steep slopes and incised drainage lines, dropping to the Cooplacurripa River. The southwestern and northeastern margins of the Project Area are situated on

the lower slopes of steep, vegetated hills and mountain ranges. Open and exposed hillsides would have likely supported woodland vegetation, with wet sclerophyll open forests occurring on more protected slopes and drainage lines.

Surrounding remnant vegetation on hilltops and hillsides outside of the Project Area are consistent with PCT 3240 and PCT 3329. These PCTs represent a tall open wet sclerophyll forest and tall sclerophyll open forest/woodland respectively and may have been more extensively distributed across Cooplacurripa valley prior to extensive land clearing for pastoral uses.

Considering the above and the findings of the desktop and field-based assessment, five PCTs have been assigned to activity areas and sub-activity areas across the Project area (Figure 6):

- 3076 | Hunter Valley Whalebone Dry Rainforest
- 3240 | Lower North Escarpment Red Gum Grassy Forest
- 3252 | Northern Hinterland Grey Gum-Mahogany Grassy Forest
- 3329 | Northern Hinterland Valleys Red Gum Grassy Forest
- 4079 | Northern Hinterland Grassy River Oak Forest

Table 13 below describes each PCT with reference to the applicable IUCN Global Ecosystem Typology at the functional group level and the NVIS at level 5 and 6. PCT profile reports for relevant PCTs are provided in Appendix D: Plant Community Type Profile Reports.

**Table 12: Description of reference ecosystems identified in the Project Area**

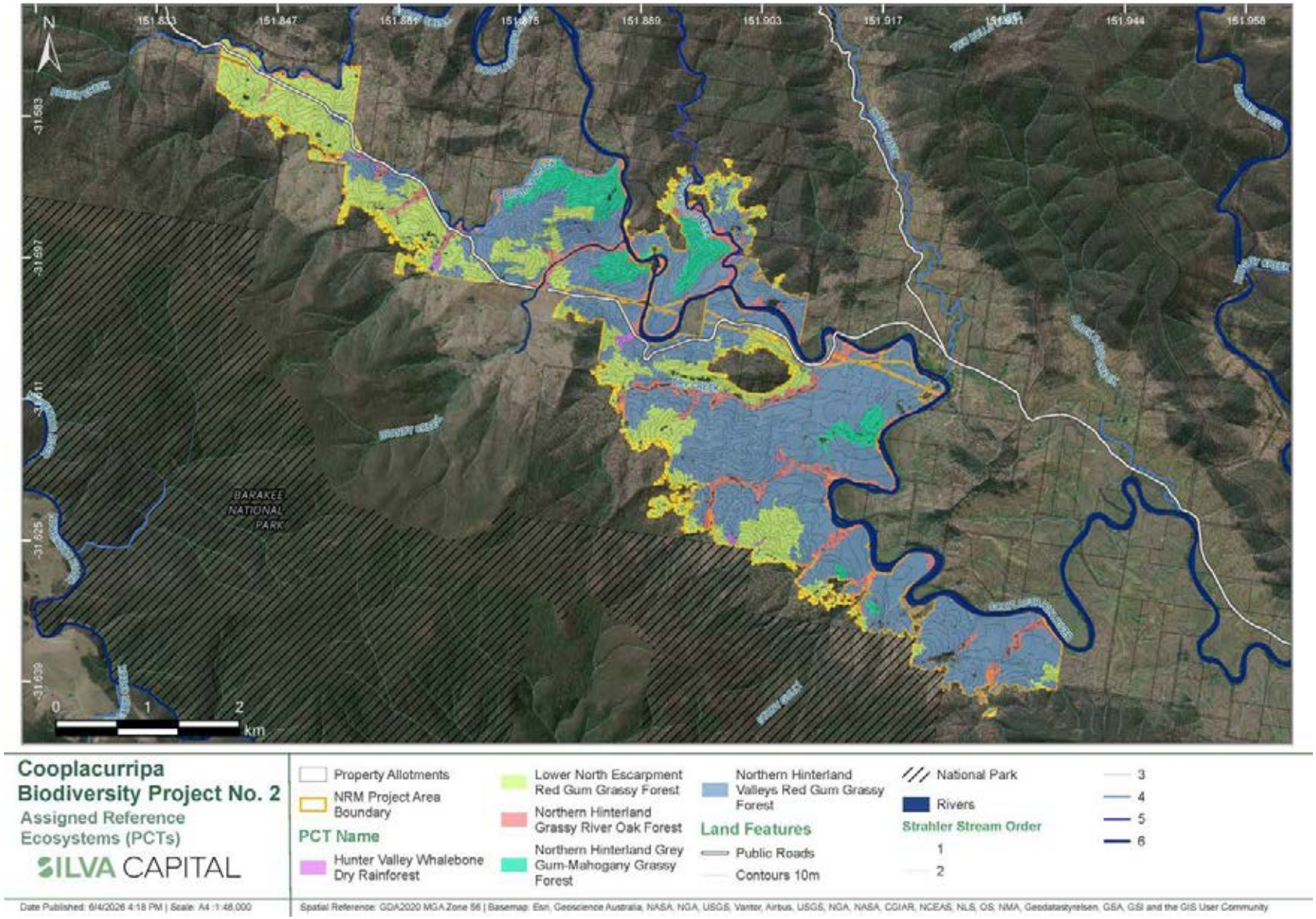
| IUCN functional group level | NVIS: Major vegetation group (MVG) & Major vegetation subgroup (MVS) | NSW Vegetation Class | PCT (NSW reference ecosystem) | Data used to identify and assign PCT | PCT description |
|---|---|---|---|---|---|
| **T1.2 Tropical/subtropical dry forests and thickets** | MVG 1 - Rainforests and Vine Thickets<br>MVS 62 - Dry rainforest or vine thickets | Dry Rainforests | 3076 \| Hunter Valley Whalebone Dry Rainforest | Small, and scattered linear patches associated with steep and/or rocky gullies or on lower hill slopes where flow is intermittent. Can occur as a dense rainforest but also as a rainforest sub-canopy with an emergent eucalypt canopy. Canopy composition is variable but often includes Red Kamala (*Mallotus philippensis*) and Whalebone Tree (*Streblus brunonianus*).<br>In the Project Area and adjacent areas, remnants are typically indicated by only scattered individual trees (typically White Cedar *Melia azedarach*, *Alectryon subdentatus* and rarely, Red Kamala (*Mallotus philippensis*)) within bare or grassed drainage gullies on hillsides and on rocky upper banks of the Cooplacurripa River. | Refer to Appendix D |

| IUCN functional group level | NVIS: Major vegetation group (MVG) & Major vegetation subgroup (MVS) | NSW Vegetation Class | PCT (NSW reference ecosystem) | Data used to identify and assign PCT | PCT description |
|---|---|---|---|---|---|
| T2.5 Temperate pyric humid forests | MVG 2 - Eucalypt Tall Open Forests<br>MVS 60 - Eucalyptus tall open forests and open forests with ferns, herbs, sedges, rushes or wet tussock grasses | Northern Hinterland Wet Sclerophyll Forests | 3240 \| Lower North Escarpment Red Gum Grassy Forest | Tall sclerophyll open forest associated with the mid to upper hillslopes. The canopy features a mix of eucalypt species including Forest Red Gum (*Eucalyptus tereticornis*), Grey Gum (*Eucalyptus canaliculata*) and Thin-leaved Stringybark (*Eucalyptus eugenioides*) with a noticeable small tree layer of she-oaks (*Allocasuarina torulosa* or *Allocasuarina littoralis*). The understorey is sparse and includes soft-leaved shrubs and small trees (e.g. *Clerodendrum tomentosum*, *C. floribundum* and Coffee Bush *Breynia oblongifolia*) and a ground cover of grasses and other graminoids as well as vines and creepers.<br>In the Project Area, large areas of improved pastures dominated by Kikuyu (*Cenchrus clandestinus*) and White Clover (*Trifolium repens*) on the mid to upper slopes of the Cooplacurripa Valley is likely to have once supported this PCT, as evidenced by adjacent remnant vegetation outside of the Project Area. | Refer to Appendix D |
| | | | 3252 \| Northern Hinterland Grey Gum-Mahogany Grassy Forest | Tall sclerophyll grassy open forest occurring on low to mid elevations in wet locations on coastal hills and escarpment foothills. Canopy frequently includes Small-fruited Grey Gum (*Eucalyptus propinqua*) or Grey Ironbark (*Eucalyptus siderophloia*), with a sub-canopy of Forest Oak (*Allocasuarina torulosa*) and a moderately dense ground layer of mixed grasses, vines and forbs. The mid-stratum is variable but is known to contain vines and mesic or soft-leaved shrubs like Coffee Bush (*Breynia oblongifolia*), Native | Refer to Appendix D |

| IUCN functional group level | NVIS: Major vegetation group (MVG) & Major vegetation subgroup (MVS) | NSW Vegetation Class | PCT (NSW reference ecosystem) | Data used to identify and assign PCT | PCT description |
|---|---|---|---|---|---|
| | | | | Guava (*Rhodomyrtus psidioides*) and White Aspen (*Acronychia oblongifolia*).<br><br>In the Project Area, large areas of improved pastures dominated by Kikuyu (*Cenchrus clandestinus*) and White Clover (*Trifolium repens*) on low hills above the Cooplacurripa River retain rare and scattered occurrences of characteristic shrub species like Native Frangipani (*Hymenosporum flavum*) and *Alectryon subdentatus*. | |
| T4.4 Temperate woodlands | MVG 5 - Eucalypt Woodlands<br><br>MVS 9 - Eucalyptus woodlands with a tussock grass understorey | Coastal Valley Grassy Woodlands | 3329 \| Northern Hinterland Valleys Red Gum Grassy Forest | This is likely to have been the most wide-spread plant community occurring across the valley floor and lower slopes along the Cooplacurripa River. It is a tall woodland to open forest with a distinctly grassy ground layer occurring on low and undulating hills in hinterland valleys. The canopy layer is characterised by Forest Red Gum (*Eucalyptus tereticornis*) or Cabbage Gum (*Eucalyptus amplifolia*), occasionally with Thin-leaved Stringybark (*Eucalyptus eugenioides*), Coastal Grey Box (*Eucalyptus moluccana*) and apples (*Angophora subvelutina* or *Angophora floribunda*) with a sparse mid-layer of mixed wattle species and Coffee Bush (*Breynia oblongifolia*). The ground layer is characterised by a mix of native grasses and forbs, including Barb-wire Grass (*Cymbopogon refractus*), Kangaroo Grass (*Themeda triandra*), Whiteroot (*Pratia purpurascens*), *Rostellularia adscendens* and Kidney Weed (*Dichondra repens*). | Refer to Appendix D |

| IUCN functional group level | NVIS: Major vegetation group (MVG) & Major vegetation subgroup (MVS) | NSW Vegetation Class | PCT (NSW reference ecosystem) | Data used to identify and assign PCT | PCT description |
|---|---|---|---|---|---|
| | | | | The lower slopes and undulating hills within the Project Area are now comprised of improved pastures dominated by Kikuyu (*Cenchrus clandestinus*) and White Clover (*Trifolium repens*), with localised and dense patches of Blady Grass (*Imperata cylindrica*) in places. On lower slopes adjacent to the Project Area, scattered and small stands of Forest Red Gum (*Eucalyptus tereticornis*) with occasional Coastal Grey Box (*Eucalyptus moluccana*) are retained. | |
| TF1.2 Subtropical / temperate forested wetlands | MVG 8 - Casuarina Forests and Woodlands<br>MVS 26 - Casuarina and Allocasuarina forests and woodlands | Eastern Riverine Forests | 4079 \| Northern Hinterland Grassy River Oak Forest | A riparian she-oak forest occurring as a gallery forest along the Cooplacurripa River, with scattered occurrences of River Oak (*Casuarina cunninghamiana*) trees present along main side tributaries. Other canopy species frequently encountered in this plant community includes White Cedar (*Melia azedarach*) and Broad-leaved Apple (*Angophora subvelutina*). The ground layer would have once been dominated by a mix of native grasses and forbs, including Weeping Meadowgrass (*Microlaena stipoides*), Basket Grass (*Oplismenus aemulus*), Forest Hedgehog Grass (*Echinopogon ovatus*), Swamp Dock (*Rumex brownii*), Native Geranium (*Geranium solanderi*) and *Commelina cyanea*. | Refer to Appendix D |

**Figure 6: Proposed Plant Community Type map for the Project Area**



## 5.2 Benchmark Values

Benchmark values for each reference ecosystem are established as shown in Table 14 and are determined in accordance with Section 30(1)(b)(i) of the Method. Benchmarks were sourced from PCT benchmark attribute data obtained from the NSW BioNet Vegetation Classification database (NSW DCCEEW, 2026b), which is on the approved benchmark source list for the Method (DCCEEW, 2025b). As the NSW BioNet Vegetation Classification database benchmarks do not include benchmark values for canopy height, canopy height benchmarks are taken from NSW Vegetation Class descriptions (NSW OEH, 2026).

The benchmarks established for the Project are shown in Table 15.

**Table 13: Details of the data used to determine benchmark indicators from the approved source benchmark list**

| Indicators | Naming equivalent or calculations used | Data source with link |
|---|---|---|
| **Approved source benchmark list used** | PCT benchmarks V1.2 for NSW (NSW DCCEEW, 2026b), | |
| canopy height of native vegetation (in metres) | Height data from vegetation class descriptions | Vegetation class information in the threatened species search application |
| crown cover from native plants in the canopy layer (as a percentage) | Tree cover | Vegetation Condition Benchmarks V1.2 \| Dataset \| SEED |
| crown cover from native plants in the mid-storey layer (as a percentage) | Shrub cover | Vegetation Condition Benchmarks V1.2 \| Dataset \| SEED |
| crown cover from plants in the canopy layer provided by non-native plants (as a percentage) | N/A | The method automatically defines this indicator as 0% |
| crown cover from plants in the mid-storey layer provided by non-native plants (as a percentage) | N/A | The method automatically defines this indicator as 0% |
| ground cover from sub-category A1, A2 and A3 plants as a proportion of total ground cover from category A plants | N/A | The method automatically defines this indicator as 100% |
| ground cover from sub-category A4 and A5 plants as a proportion of total ground cover from category A plants | N/A | The method automatically defines this indicator as 0% |
| **native species richness index by life form (sub-indicator)** | | |
| native tree | Tree richness | Vegetation Condition Benchmarks V1.2 \| Dataset \| SEED |
| shrub | Shrub richness | Vegetation Condition Benchmarks V1.2 \| Dataset \| SEED |
| vine | 'Other' richness (see assumptions and notes) | Vegetation Condition Benchmarks V1.2 \| Dataset \| SEED |

| Indicators | Naming equivalent or calculations used | Data source with link |
|---|---|---|
| grass | Grass and grasslike richness | Vegetation Condition Benchmarks V1.2 \| Dataset \| SEED |
| herbaceous vascular plant species other than grasses | Forb richness + fern richness (see assumptions and notes) | Vegetation Condition Benchmarks V1.2 \| Dataset \| SEED |

### 5.2.1 Assumptions and explanatory notes

Assumptions and explanatory notes regarding the relationship between ecosystem indicators/sub-indicators, and PCT benchmark attributes are outlined below:

- Benchmark values are taken from datasets derived from average rainfall years for the NSW North Coast IBRA region.
- Cover (%) indicators: benchmark cover values taken from the PCT benchmarks represent projective foliage cover, whilst cover metric used by the Method represent crown cover. For the purposes of this SSA, the PCT cover benchmarks are applied as crown cover values.
- All native species in NSW are assigned to a growth form under the NSW Biodiversity Assessment Method (BAM). The assignment of native plant species to ground cover categories and species form is informed by growth form groups defined under the NSW BAM:
  - Tree (TG)
  - Shrub (SG)
  - Other (OG)
  - Grass and Grass-like (GG)
  - Forb (FG)
  - Fern (EG)
- Species richness indicators:
  - **Native species richness (no. of native vines)**: the benchmark value for the “other richness” attribute has been applied to this ecosystem indicator. The “other richness” benchmark value includes species contributions from the following lifeforms; vines species richness cannot be separated as a single value:
    - Cycad
    - Epiphyte
    - Palm & palmlike
    - Tree fern
    - Vine
    - Xanthorrhoea.
  - **Native species richness (no. of native grass species)**: the benchmark value for the “Grass and Grass-like richness” attribute is applied to this ecosystem indicator and includes rush and sedge species contributions.
  - **Native species richness (no. of native herbaceous vascular species)**: the sum of the benchmark values for the “forb richness” and “fern richness” attributes is applied to this ecosystem indicator.

- The benchmark value for non-native ecosystem indicators is set at zero (the Method automatically defines this indicator as 0%). This assumes that weed cover and weed species richness in benchmark condition is negligible.

**Table 14: Benchmark values**

| Indicator | Reference ecosystem | | | | |
|---|---|---|---|---|---|
| | PCT 3076 | PCT 3240 | PCT 3252 | PCT 3329 | PCT 4079 |
| **canopy height of native vegetation (m)** | 5-20 | 40 | 40 | 20-35 | 10-40 |
| **crown cover - canopy native (%)** | 72 | 79 | 79 | 60 | 47 |
| **crown cover - midstorey native (%)** | 54 | 20 | 20 | 11 | 6 |
| **crown cover - canopy non-native (%)** | 0 | 0 | 0 | 0 | 0 |
| **crown cover - midstorey non-native (%)** | 0 | 0 | 0 | 0 | 0 |
| **ground cover (proportion of A category plants):** | | | | | |
| sub-category A1 – A3 as a proportion of total groundcover from category A plants (%) | 100 | 100 | 100 | 100 | 100 |
| sub-category A4 A5 as a proportion of total groundcover from category A plants (%) | 0 | 0 | 0 | 0 | 0 |
| **native species richness index by life form (sub-indicator):** | | | | | |
| tree | 11 | 10 | 10 | 6 | 5 |
| shrub | 12 | 11 | 11 | 7 | 6 |
| vine | 12 | 10 | 10 | 5 | 4 |
| grass | 4 | 9 | 9 | 12 | 8 |
| herbaceous vascular | 13 | 14 | 14 | 16 | 13 |

## 5.3 Field Assessment

### 5.3.1 Preliminary assessment

The starting condition state assessment is underpinned by the data metrics collected from permanent sampling plots. The location and number of sampling plots that are required are determined by the size and area of identified activity areas.

As starting ecosystem condition state is one of the factors that determine activity areas, a reduced assessment of condition state was undertaken across the Project Area to produce a preliminary map of activity areas to guide the placement and number of sampling plots.

Preliminary activity areas were subsequently adjusted as sampling plot data became available; the activity area mapping was adjusted iteratively and concurrently with the progression of the starting state assessment.

## Desktop mapping

Desktop stratification of potential starting condition state was initially carried out utilising the following data layers:

- NSW Land Use mapping data (NSW DCCEEW, 2017)
- High-resolution aerial (Agronomeye, 2025)
- Fencelines and paddock boundary data

NSW Land Use data was reviewed and revised based on aerial imagery and paddock boundaries to identify areas in homogenous condition. The NSW Land Use tertiary codes were used to map likely starting ecosystem condition state in accordance with the definitions in Table 16. From this, an initial map of starting ecosystem condition state was prepared for field validation.

**Table 15: NSW Land Use tertiary codes and corresponding starting ecosystem condition state**

| NSW Land Use tertiary code | Corresponding starting ecosystem condition state |
|---|---|
| **1.3.0 Other minimal use** | A or B |
| **1.3.3 Residual native cover** | A or B |
| **2.1.0 Grazing native vegetation** | B or C |
| **3.2.0 Grazing modified pastures** | B or C |
| **3.3.0 Cropping** | D |

## Rapid field assessment

A step-wise field assessment was undertaken and guided by field-ready definitions of ecosystem condition state (Table 17), which was simplified from Section 12 of the Method. The field validation assessment was intended to be a quick and high-level exercise to enable early stratification of the Project Area. Preliminary activity areas identified was used to guide subsequent sampling plot surveys and further refinement of activity area boundaries. As site preparation coincided with the optimal time for conducting surveys, the rapid field assessment further served to identify areas which were likely starting state A and to exclude these areas from ground decompaction works.

The rapid field assessment was completed in September 2025, as follows:

- Initial visual assessment to (1) stratify the Project Area into large areas of homogenous condition, and to (2) mark out areas where condition state could be estimated to a reasonably high degree of confidence. For example:
  - paddocks where non-native cover is clearly >5% but ≤50% (e.g. 25%) = State B
  - paddocks dominated by Kikuyu (*Cenchrus clandestinus*) (e.g. > 75%) = State C
  - paddocks with existing crop species = State D.

  As the Project Area is very large, the visual assessment was undertaken by recording notes systematically along a 200 m grid applied over the Project Area. In total, condition notes were recorded at 261 points spread across the Project Area.
- For uncertain areas requiring further investigation (i.e. areas that could not be clearly categorised on a visual assessment, e.g. where non-native cover <10% or close to 50%), a rapid step-count representing a simplified version of the point-intercept method was undertaken on a 200 m grid or where needed to assess a homogeneous area in more detail. The rapid step-count was undertaken as follows:
  - 50 steps were undertaken at ~1 m intervals along a straight line, counting the number of native and non-native/ non-indigenous species hits at each step

- the counts of native and non-native/ non-indigenous species hits were multiplied by 2 to calculate a percentage value out of 100%
- areas where the cover of non-native/ non-indigenous hits were ≤10% were identified on a preliminary basis as State A
- areas where the cover of non-native/ non-indigenous hits were within a few percentages of 50% were identified on a preliminary basis as State B.

**Table 16: Functional definitions for starting condition state for preliminary assessment**

| Starting ecosystem condition state | Functional definition to be used |
|---|---|
| **A** | • Ground cover is mainly diverse native species.<br>• Non-indigenous/non-native groundcover ≤5%. |
| **B** | • Not State A.<br>• Ground layer is a mix of natives (may include non-indigenous species).<br>• Non-indigenous/non-native groundcover ≤50%. |
| **C** | • Not State A or B.<br>• Ground layer is dominated (>50%) by non-indigenous species (e.g. pasture grasses, weeds).<br>• Area has not been cropped in past 5 years. |
| **D** | • Not State A, B or C.<br>• Typically, highly degraded areas (bare ground, or clearly cropped within last 5 years, very low vegetation cover). |

### 5.3.2 Permanent Sampling Plot Establishment

#### Plot locations

Thirty-two permanent sampling plots were established in eight activity areas across the Project Area. The locations of each sampling plot are shown on Figure 7 and Figure 8 and location details are summarised in Appendix E: Plot Location Details. The locations of permanent markers and centre lines are provided as spatial layers in a separate data package to this SAR.

#### Survey timing

As required by the method the starting state assessment was undertaken at, or as close as practical to, the time of optimal plant growth for the region. This was determined primarily by reviewing rainfall and temperature data (Bureau of Meteorology, 2026), in combination with observations of growing conditions on ground throughout the assessment.

Plot surveys were undertaken over multiple visits during periods of good growth following rainfall peaks in August and January:

- 27-28 November 2025
- 9-13 December 2025
- 19-23 January 2026
- 18-19 March 2026.

#### Survey design and effort

Schedule 5(2)(4) of the Method sets out the number of sampling plots required, as determined by the size of the activity area. In practice, the sampling intensity was determined conservatively at the PCT level (i.e.

sub-activity area level) and updated iteratively as the starting condition state mapping and PCT mapping were progressively refined. As a result, sampling exceeded the minimum number of plots required.

At a desktop level, the activity area was coarsely divided by the number of sampling plots, with plots being placed randomly within each portion to maximise the spread of sampling plot locations. Where ground-truthing indicated that the selected location was not suitable (e.g. not representative, or located within 50 m of roads, fencelines and actively used tracks), the location was moved to a nearby area that was representative of the activity area. At the conclusion of the survey program, excess plots were abandoned to retain the minimum plots needed for this SSA. The plots that were retained were selected to maintain an adequate spread of plots across the activity area.

A summary of the sampling plots established for the Project is provided in Table 18. The location details for all permanent sampling plots are provided in Appendix E and includes start and end locations of permanent markers as well as the bearing of the centreline of each sampling plot.

**Table 17: Permanent sampling plots**

| AA ID | Area (ha) | No. plots required | Plots completed |
|---|---|---|---|
| **AA1** | 1.43 | 2 | T21, T22 |
| **AA2** | 4.28 | 2 | T15, T23 |
| **AA3** | 21.39 | 4 | T27, T40, T42, T43 |
| **AA4** | 394.70 | 7 | T05, T06, T14, T18, T19, T24, T29 |
| **AA5** | 5.21 | 3 | T35, T36, T45 |
| **AA6** | 709.08 | 7 | T01, T02, T03, T04, T07, T08, T11 |
| **AA7** | 1.24 | 2 | T38, T46 |
| **AA8** | 92.98 | 5 | T20, T32, T33, T34, T37 |
| **Total** | **1,230.32** | **32** | **32** |

## Photo monitoring

Photo monitoring was undertaken in accordance with Schedule 5(3) of the Method. The photos are provided in Appendix F.

## Sampling plot method

Sampling plot establishment and data collection methods followed Schedule 3 (point intercept method), Schedule 4 (quadrat method) and Schedule 5 (Sections 1-8) of the Method, noting the following assumptions and limitations listed below.

### Assumptions and limitations

**Point intercept method**

Schedule 3 of the Method specifies that each of 50 sampling points along a 50 metre transect should be assigned to a groundcover category or subcategory. In practice, multiple groundcover categories can be recorded against every sampling point because the groundcover is often layered. Therefore:

- Where more than one groundcover species intercepts a 1-metre sampling point, all species are recorded (as required by Schedule 3, Step 2(3) of the Method) but the groundcover category of the most “apparent” species is assigned to the sampling point.

- Where multiple groundcover entities (including dead or alive plant species, rocks, litter, bare ground, and cryptogams) intercepts a 1-metre sampling point, the subcategory is preferentially assigned by alive plants, then dead, then non-plant groundcovers in that order as it applies.

**Quadrat method**

- Where a groundcover species occurs in a quadrat as both alive and dead plants, the % crown cover of both the dead and live plants are recorded so that the requirement of Schedule 4, paragraph 3(b) of the Method can be met.

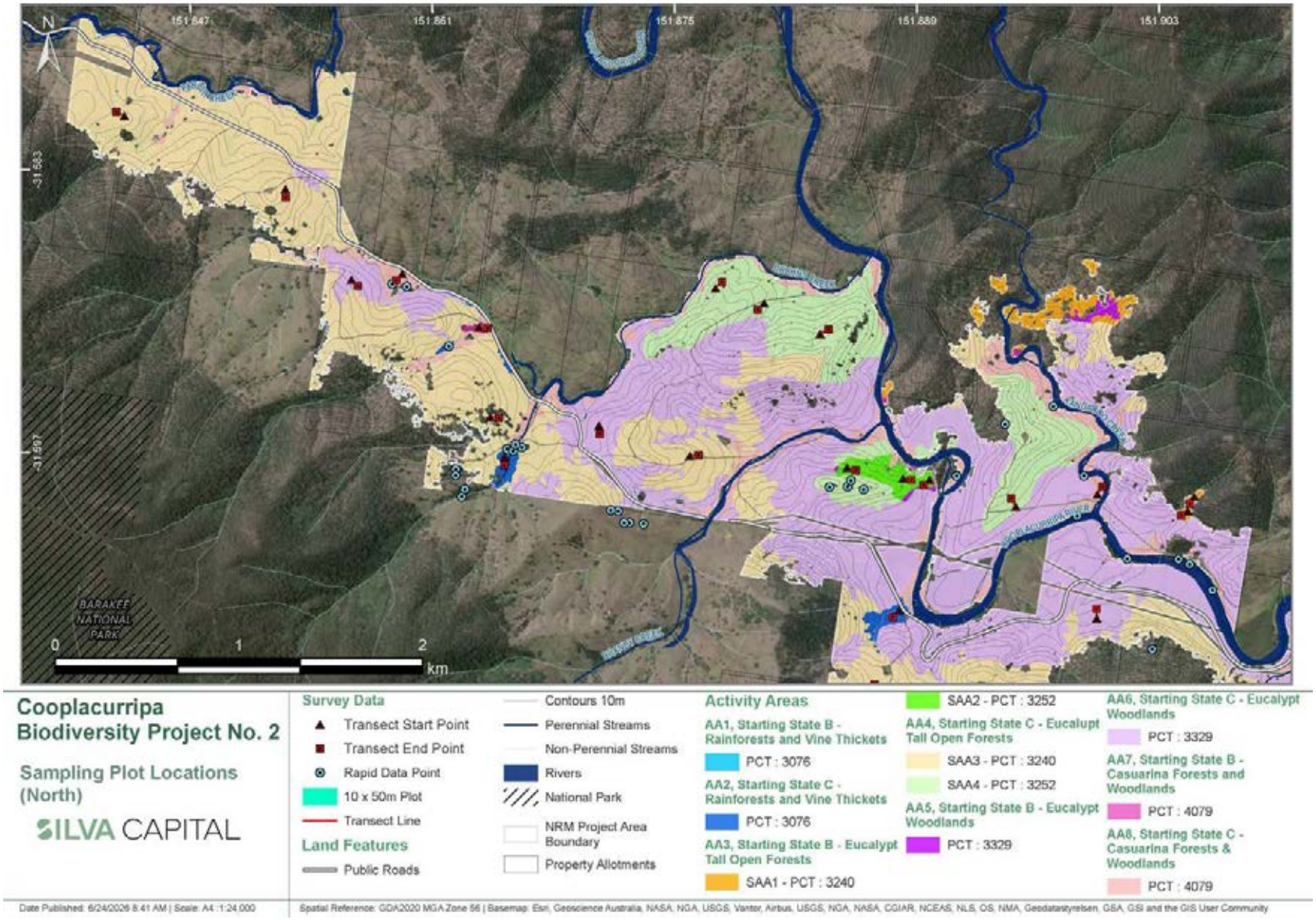
**Plot floristics method**

- Where a species occurrence in a sampling plot does not include live plants (i.e. only dead plants recorded of that species), the species was still recorded but noted as being, 'found in plot as dead only' in the note column.

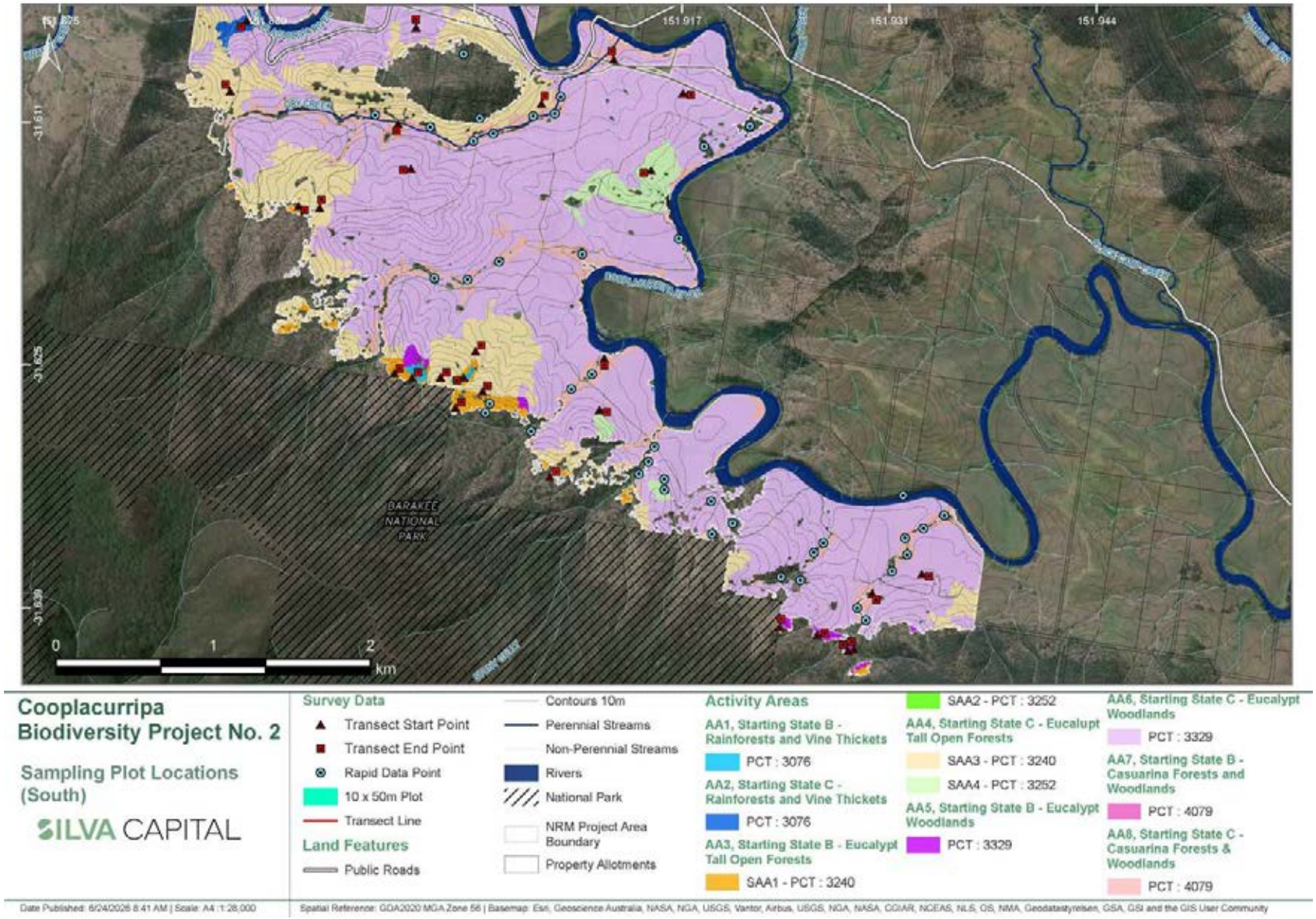
**General**

- Litter refers to detached dead material (i.e. groundcover category E) whereas attached dead material is referred to as a dead plant (i.e. groundcover category C or D).
- The exception to the above is attached dead material from a perennial grass species that is clearly still alive but seasonally browned off (e.g. in the instance of Kikuyu (*Cenchrus clandestinus*), Paspalum (*Paspalum dilatatum*), Common Couch (*Cynodon dactylon*), etc.). Under these conditions, the plant is treated as being alive.
- Native and non-native shrubs and trees below 1m were treated as groundcover based on definitions of category A plants from Section 12(2) of the Method.

## Figure 7: Sampling Plot Locations (North)



## Figure 8: Sampling Plot Locations (South)



## 5.4 Starting Values for Ecosystem Condition Indicators

**Table 18: Starting Ecosystem Condition Indicator Values**

| Indicators/sub-indicators | AA1 | AA2 | AA3 | AA4 | AA5 | AA6 | AA7 | AA8 |
|---|---|---|---|---|---|---|---|---|
| (a) canopy height of native vegetation (m) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (b) crown cover - canopy native (%) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (c) crown cover - midstorey native (%) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (d) crown cover - canopy non-native (%) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (e) crown cover - midstorey non-native (%) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (f) proportion of native ground cover – A1+A2+A3 (%) | 82.75 | 19.81 | 74.10 | 24.73 | 71.14 | 16.04 | 73.20 | 24.61 |
| (g) proportion of exotic ground cover – A4+A5 (%) | 17.25 | 80.19 | 25.90 | 75.27 | 28.86 | 83.96 | 26.80 | 75.39 |
| native species richness index by life form (sub-indicator): | | | | | | | | |
| tree | 1 | 1 | 1 | 0 | 2 | 0 | 0 | 0 |
| shrub | 1 | 0 | 2 | 0 | 0 | 1 | 1 | 0 |
| vine | 4 | 1 | 3 | 4 | 3 | 2 | 2 | 4 |
| grass | 15 | 15 | 25 | 24 | 23 | 16 | 20 | 27 |
| herbaceous vascular | 16 | 6 | 24 | 12 | 14 | 14 | 14 | 14 |
| TOTAL | 37 | 23 | 55 | 40 | 42 | 33 | 37 | 45 |
| (h) Native species richness index (NSRI) | 0.38 | 0.20 | 0.44 | 0.27 | 0.57 | 0.24 | 0.63 | 0.46 |

## 5.5 Starting Ecosystem Condition State

**Table 19: Overall cover percentage of sub-category A plants**

| AA | % cover A1 plants | % cover A2 plants | % cover A3 plants | % cover A4 plants | % cover A5 plants |
|---|---|---|---|---|---|
| **AA1** | 81.03 | 0.27 | 1.45 | 17.25 | 0.00 |
| **AA2** | 15.61 | 3.95 | 0.26 | 80.19 | 0.00 |
| **AA3** | 70.06 | 2.20 | 1.84 | 25.90 | 0.00 |
| **AA4** | 23.62 | 0.90 | 0.21 | 75.27 | 0.00 |
| **AA5** | 61.64 | 5.31 | 4.19 | 28.86 | 0.00 |
| **AA6** | 15.37 | 0.64 | 0.04 | 83.96 | 0.00 |
| **AA7** | 65.42 | 1.33 | 6.45 | 26.80 | 0.00 |
| **AA8** | 24.10 | 0.30 | 0.20 | 75.39 | 0.00 |

**Table 20: Number of category A and sub-category A species**

| AA | No. of A1 species | No. of A2 species | No. of A3 species | No. of A4 species | No. of A5 species | Total no. of category A species |
|---|---|---|---|---|---|---|
| **AA1** | 15 | 20 | 2 | 20 | 0 | 57 |
| **AA2** | 15 | 7 | 0 | 25 | 0 | 47 |
| **AA3** | 25 | 27 | 2 | 33 | 0 | 87 |
| **AA4** | 24 | 16 | 0 | 33 | 0 | 73 |
| **AA5** | 23 | 17 | 0 | 17 | 0 | 57 |
| **AA6** | 16 | 16 | 1 | 31 | 0 | 64 |
| **AA7** | 20 | 16 | 1 | 17 | 0 | 54 |
| **AA8** | 27 | 18 | 0 | 31 | 0 | 76 |

**Table 21: Starting ecosystem condition state for each activity area**

| AA | Starting Condition State | State and Transition Models (STM) starting ecosystem state |
|---|---|---|
| **AA1** | B | 10: Sparse or absent understorey |
| **AA2** | C | 11: Sparse or absent overstorey, highly modified understorey |
| **AA3** | B | 10: Sparse or absent understorey |
| **AA4** | C | 11: Sparse or absent overstorey, highly modified understorey |
| **AA5** | B | 10: Sparse or absent understorey |
| **AA6** | C | 11: Sparse or absent overstorey, highly modified understorey |
| **AA7** | B | 10: Sparse or absent understorey |
| **AA8** | C | 11: Sparse or absent overstorey, highly modified understorey |

## 5.6 Ecosystem Condition Scores

**Table 22: Ecosystem scores for the Project**

| Activity Area | Starting ecosystem condition score | Forecast ecosystem condition score | Starting contribution to biodiversity persistence score | Forecast contribution to biodiversity persistence score |
|---|---|---|---|---|
| **AA1** | 0.45 | 0.55 | 0.43 | 0.53 |
| **AA2** | 0.35 | 0.45 | 0.99 | 1.28 |
| **AA3** | 0.45 | 0.55 | 2.93 | 3.58 |
| **AA4** | 0.35 | 0.45 | 42.27 | 54.48 |
| **AA5** | 0.45 | 0.55 | 0.26 | 0.32 |
| **AA6** | 0.35 | 0.45 | 27.41 | 35.33 |
| **AA7** | 0.45 | 0.55 | 5.56 | 6.79 |
| **AA8** | 0.35 | 0.45 | 329.33 | 423.38 |
| **Aggregate scores for the Project** | **0.3524** | **0.4524** | **428.47** | **554.08** |

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# Appendices

# Appendix A: Curriculum Vitae (Suitably Qualified Persons)

# Cecilia Phu

Principal Botanist

Nature Positive Advisory Pty Limited

## Professional Overview

Cecilia is a consultant botanist with over 18 years of practice experience and has worked extensively in the Hunter and Central Coast regions, as well as the western slopes, central-west and north-west regions of NSW. A NSW accredited BAM assessor, Cecilia has led and delivered biodiversity impact assessments, developed offset strategies and prepared EPBC Act referrals for state significant projects, local developments, and public works across a diverse range of sectors including mining, extractive, transport and transmission infrastructure, renewable energy, residential and commercial development. Cecilia specialises in terrestrial vegetation survey and assessment throughout NSW and focuses on delivering robust assessments backed by data. Cecilia works closely with clients and project teams to identify solutions that achieve positive project outcomes.

## Qualifications and licences

- Member of the Environment Institute of Australia and New Zealand (MEIANZ)
- Member of the Ecological Society of Australia (MESA)
- Accredited BBAM and BAM Assessor
- Bachelor of Science, Biology (Hons), University of Sydney, 2008
- Senior First Aid Certificate
- Rail Industry Worker Card
- 4WD Driver Training
- Workcover Construction White Card

## Specialisation

- Terrestrial vegetation survey and assessment
- Biodiversity Assessment Method

## Work history

- Principal Botanist, Nature Positive Advisory Pty Ltd (June 2025 – current)
- Associate Ecologist | Team Manager - Ecology, EMM Consulting Pty Limited (September 2023 – May 2025)
- Associate Ecologist | Team Leader – Ecology (NSW), EMM Consulting Pty Limited (September 2020 – August 2023)
- Senior Ecologist (Botany), GHD (April 2018 - September 2020)
- Senior Ecologist (Botany), Kleinfelder Australia (May 2017 – March 2018)
- Senior Project Manager | Ecologist, Cumberland Ecology (now SLR) (July 2010 – April 2017)
- Ecologist | Project Manager, Cumberland Ecology (now SLR) (November 2006 – June 2010)

## Representative experience

### Biocertification projects

- Biocertification to support Planning Proposal for urban/residential project, Fennell Bay NSW (Landcom)
- Biocertification to support Planning Proposal for urban/residential project, Kingscliff NSW (Gales Kingscliff Pty Ltd)
- Biocertification to support Planning Proposal for urban/residential project, Manyana NSW (JWD Project Pty Ltd)
- Biocertification to support Planning Proposal for several sites on the Central Coast NSW (Darkinjung Aboriginal Land Council)
- Biocertification to support subdivision proposal at Lake Munmorah NSW (Landcom)

### Biodiversity assessments

- Cooplacurripa Biodiversity Project No. 2 Starting State Assessment and Project Plan, Cooplacurripa NSW (Covalent Land Australia Pty Ltd)
- Category 1 land assessment and low conservation values grassland assessment, Hunter Valley NSW (Covalent Land Australia Pty Ltd)
- Dog Trap Hill Biodiversity Stewardship Agreement, Yeoval NSW (Woodside Pastoral)
- Long Gully Farm Biodiversity Stewardship Agreement, Breakfast Creek NSW (Steve McCall)
- Tycannah East and West Biodiversity Stewardship Agreement, Moree NSW
- Sundown Solar Farm, Biodiversity Development Assessment Report, Glenn Innes NSW (Canadian Solar)
- Wellington BESS, Biodiversity Development Assessment Report, Wellington NSW (AMPYR Australia)
- New England Solar Farm MOD 2, Biodiversity Development Assessment Report, Uralla NSW (UP/C Renewables)
- New Shellharbour Hospital, Biodiversity Development Assessment Report, Shellharbour NSW (Health Infrastructure)
- Belmont temporary desalination project, biodiversity assessment, Belmont NSW (Hunter Water)
- Sydney Light Rail Stage 2, impact assessment, Sydney NSW (Transport for NSW)

- Mt Arthur Coal Mine, ecological impact assessment, Muswellbrook NSW (BHP Billiton)
- Bengalla Mine Extension, ecological impact assessment, Muswellbrook NSW (Coal and Allied)
- Maules Creek Coal Project, ecological impact assessment, Boggabri (Whitehaven Coal)
- Mt Pleasant Coal Project, ecological impact assessment, Muswellbrook NSW (Rio Tinto)
- Drayton South Coal Mine, ecological impact assessment, Muswellbrook NSW (Anglo American)
- Curragh Mine, ecological impact assessment, Blackwater Qld (BHP Billiton)
- Project China Stone, ecological impact assessment, Clermont Qld (MacMines Austasia)
- GEMCO Eastern Leases Project, ecological impact assessment, Groote Eylandt NT (Groote Eylandt)
- Tampakan Copper-Gold Project, terrestrial and aquatic impact assessment, Mindanao Island Philippines (Saggitarius Mines)
- Dungog Rural Land Use Strategy Review, biodiversity lands assessment, Dungog NSW (Dungog Shire Council)
- Meadowbank Pedestrian Access Project, biodiversity constraints analysis, Meadowbank NSW (Transport for NSW)
- Wollar Preliminary Regional Issues Assessment, review of biodiversity constraints, Wollar NSW (Department of Planning, Industry and Environment)
- Bob's Farm Sand Extraction Project, biodiversity gaps analysis and feasibility advice, Bob's Farm NSW (Strategy Assessment Management)
- Somersby Development Constraints Analysis, biodiversity constraints analysis, Somersby NSW (Department of Planning and Environment)
- Project Hume, biodiversity due diligence assessment, Medway NSW (Landcom)
- Project Summit, biodiversity due diligence assessment, Lochinvar NSW (Landcom)
- Undisclosed project, biodiversity due diligence assessment for a proposed solar farm in the CWO REZ, Dunedoo NSW (Pacific Partnerships)
- Hunter Transmission Connections Project, biodiversity constraints assessment (EnergyCo)
- Transport Access Projects at Normanhurst Train Station, biodiversity assessment, Normanhurst NSW (Transport for NSW)
- Transport Access Projects at Thornleigh Train Station, biodiversity assessment, Thornleigh NSW (Transport for NSW)
- Sewerage Treatment Scheme for township of Wyee, biodiversity impact assessment, Wyee NSW (Hunter Water)
- Sewerage Upgrade for township of Bundarra, biodiversity impact assessment, Bundarra, NSW (Uralla Shire Council)
- Sewerage Treatment Scheme for township of Cullen Bullen, biodiversity impact assessment, Cullen Bullen NSW (Lithgow City Council)
- Richmond Vale Rail Trail Project, biodiversity development assessment report, Richmond Vale NSW (Newcastle City Council)
- Epping to Thornleigh Third Track Project, impact assessment, Epping to Thornleigh NSW (Transport for NSW)
- M2 upgrade, impact assessment, Sydney NSW (Roads and Maritime Service)
- Ecological assessments for sewer and stormwater infrastructure, Sydney Growth Centres (Sydney Water)
- Powerline upgrade project, impact assessment, Sydney NSW (Novorail Alliance)

### Vegetation and ecological risk mapping

- Inland Rail Project, vegetation mapping and threatened species survey, Narrabri to Narromine NSW (ARTC Rail Network)
- Ecological risk mapping project, Ulan Single Line and Mt Thorley Loop, NSW (ARTC Hunter Valley)
- Ecological risk mapping project, Kundabung to Lawrence Drive NSW section (ARTC Interstate)
- Port Kembla to Wilton Gas Pipeline Project, vegetation mapping and targeted threatened flora surveys, Port Kembla to Wilton NSW (APA Group)
- East Grampians Rural Pipeline Project, rapid vegetation assessment, East Grampians NSW (GWMWater)

### Commonwealth assessments

- Williamtown Sand Quarry, EPBC Act preliminary documentation, Williamtown NSW (Williamtown Sand Syndicate)
- Emirates One&Only eco-resort, EPBC Act public environment report, Wolgan Valley NSW (Emirates Australia)

### Threatened species

- Threatened species monitoring, northern dunes bi-annual monitoring, *Syzygium paniculatum* surveys, Mungo Brush National Park NSW (Office of Environment and Heritage)
- Saving our species project: Monitoring and management works for four threatened species on the Northern Tablelands, NSW (Office of Environment and Heritage)
- Targeted survey for threatened flora species *Corunastylis* sp. Charmhaven, *Thelymitra adorata*, *Cryptostylis hunteriana* and *Rutidosis heterogama,* Warnervale NSW (Pastoral Investment Land and Loan Pty Ltd)
- Swift Parrot and Regent Honeyeater Project Plan with the Australian National University, Maules Creek Project (Whitehaven Coal)
- Mt Arthur Coal Mine, annual monitoring of a *Diuris tricolor* population, Muswellbrook NSW (BHP Billiton)

### Biodiversity monitoring and management

- M4 widening, construction pre-clearing and clearing supervision, Sydney NSW (Westconnex)

- Snowy 2.0 Main Works, biodiversity monitoring program 2020-2023 (Snowy Hydro Limited)
- Mt Arthur Coal Mine, annual flora and fauna monitoring, Muswellbrook NSW (BHP Billiton)
- Ravensworth Mine, flora and fauna monitoring, Liddell (Glencore)
- Donaldson Coal Mine, post-mining monitoring, Black Hill NSW (Yancoal)
- Ashton Coal Project, post-mining monitoring, Camberwell NSW (Ashton Coal Operations)
- Irrawang Swamp, wetland monitoring and mapping, Raymond Terrace NSW (Hunter Water)
- Grahamstown Dam, wetland health and condition monitoring, Tomago NSW (Hunter Water)
- Newstan Mines, wetland monitoring, Fassifern NSW (Centennial Coal)
- Mandalong Mines, wetland monitoring, Mandalong NSW (Centennial Coal)
- Wianamatta Regional Park Grazing Exclusion Monitoring, Ropes Crossing and Jordan Springs NSW (Lendlease)
- Shannon Creek Dam, annual flora and fauna monitoring, Clarence Valley NSW (Clarence Valley Council)
- Macropod grazing exclosure study within the Wianamatta Regional Park, St Marys NSW (Lendlease)
- Solar Farm Grassland VI study (Department of Planning)

**Environmental audits**

- M8 Independent Environmental Audit WestConnex Stage 2: M5 – Beverly Hills to St Peters ("the New M5") Technical Specialist (Biodiversity) review
  (Fulton Hogan Egis Operation and Maintenance)
- Independent Environmental Audit Tomago Aluminium, Technical Specialist (Biodiversity) review, Tomago NSW
  (Tomago Aluminium Company Pty Ltd)
- Project Approval Compliance Audit Ulan Coal Mine, Technical Specialist (Biodiversity) review, Ulan NSW
  (Ulan Coal Mine Limited)

# Martin Campbell

## SKILLS

Land management
Ecology
Grounds maintenance
Safety
Service Delivery
Stakeholder engagement
Asset management
Reporting
Governance

## EDUCATION

**University of Canberra**

Bachelor of Environmental Science (Vegetation Ecology)

**CIT Canberra Institute of Canberra**

Diploma of Horticulture (Landscape)

Certificate in Horticulture

Certificate in Animal Science

## ECOLOGY MANAGER

Covalent Land Australia | Canberra, ACT

Martin is a qualified and experienced ecologist with over 25 years' experience managing the environment and natural resources for the Department of Defence estates and military training ranges. Within the diverse land management portfolio under Martin's management, includes disciplines such as bushfire preparedness and mitigation, weed and vertebrate management, threatened species programs, overabundant native species, Cultural and Heritage management, sustainability and tree management and holds extensive experience in project management including safety and risk management.

Graduating from Canberra University with a Bachelor of Science Degree in Vegetation Ecology, Martin has experience working throughout the ACT, NSW and QLD regions. Martin is a qualified Horticulturalist and has experience working in Australian, European and Japanese landscapes. During this time Martin was able to work in a wide variety of horticultural fields such as landscape management, green keeping, nursery practices in propagation and seed collection, landscaping construction, floral displays and garden style such heritage and Japanese styles.

## EXPERIENCE

**ECOLOGY MANAGER**
**Covalent Land Australia | 2024 – present**

Leading the delivery and expansion of high-integrity land restoration projects through carbon and nature-based finance, driving sustainable outcomes that enhance natural capital and productive land use. Building customer value by integrating strategic stakeholder engagement, risk management, and resilience principles to deliver innovative, commercially viable restoration solutions.

**ENVIRONMENTAL PROJECTS SUPERVISOR**
**Downer Defence | 2018 – 2023**

Responsible for the delivery of all Environmental projects within ACT/SNSW Defence Estates. Projects managed are environmental weed & vertebrate management, bushfire mitigation, heritage (cultural/European) management, threatened species management, tree management, bushland regeneration. This role also supports the SNSW regions of the Riverina and Shoalhaven regions.

## OTHER QUALIFICATIONS

Certificate Vertebrate Pest Management

Certificate 5 in Frontline Management

Certificate in ChemCert (21001585)

Certificate in chainsaw operation – Trim & Cross Cut

Certificate in Frontend Loader Operation

Certificate 212A Grassfire First Response

Certificate in WH&S White Card (03493)

Certificate in Microsoft packages

Certified Wires Reptile Handler

Senior First Aid

**SHOALHAVEN LAND COORDINATOR**
**Spotless Facilities Services | Nov 2015 – Feb 2018**

Responsibilities in this position was the transition into the Estate Management & Operational Services (EMOS) contract for ACT/SNSW. Responsible for the delivery of ground services in the ACT/SNSW regions. The position was also responsible for the management of the environmental projects for weeds, vertebrates, and bushfire management, along with the company compliance for all auditing, staff management, service delivery, innovation, implementation and management of safety, budgeting, asset management, stakeholder engagement and senior management reporting.

**REGIONAL ENVIORNMENTAL/GROUND MANAGER – SNSW DEFENSE ESTATES**
**Serco Sodexho Defense Services | Feb 2008 – Oct 2014**

Responsible for the delivery of the Environment & Heritage, Land & Estates, Grounds maintenance, Pest and Vermin and Sustainability (waste & water). The role was also responsible for the management

of all staff, asset management, governance, budgets, stakeholder and senior management reporting, safety.

# Cuong Tran

## SKILLS

Natural Resource Management

Subject Matter Expert Bushfire

Financial Acumen

Team Leadership

Project Planning

Accountability

Improving Efficiency

Risk Assessment

Strategy Into Practice

## TECHNICAL SKILLS

Bushfire Behaviour

ArcGIS / Spatial Data

Landscape Ecologist

Project Management

## EDUCATION

BACHELOR OF SCIENCE (1st CLASS HONS)
Biology Major
Griffith University 1992–96

DOCTOR OF PHILOSOPHY
Fire Ecology & Flammability
Griffith University 2008

## CHIEF EXECUTIVE OFFICER

Covalent Land Australia | Brisbane, QLD

Cuong has over 20 years' experience in bushfire research and management and is a recognised expert in the field of fire management, ecology and planning. He has applied novel and new ways of thinking to traditional land management practices, particularly by incorporating environmental risk impacts such as bushfires. Cuong is a transformative leader and facilitator, nurturing his team to get their best. Leading cultural change improves business performance, Cuong loves playing a role in that.

## EXPERIENCE

**CHIEF EXECUTIVE OFFICER**
**Covalent Land Australia | September 2024 – present**

Support the scaling of high integrity land restoration projects through carbon financing, whilst enhancing natural and Cultural heritage and primary production values. Focused on building highly effective teams and nurturing a rich and diverse culture. Applying knowledge of landscape ecological fire regimes under a changing climate to reduce risk and enhance environmental values.

**PRINCIPAL – SUSTAINABILITY & CLIMATE CHANGE**
**Aurecon – Market Advisory Group | 2022 – September 2024**

Lead nature-based carbon abatement & sequestration programs, providing tailored solutions to reduce liabilities, presenting high integrity projects with identifiable co-benefits (such as biodiversity).

**GENERAL MANAGER**
**Covalent Land Australia (renamed from Market Advisory Group – Project Services) | 2020 – September 2024**

Lead delivery of programs for groups / corporations to establish as carbon market developers. Assist in solutioning, integrating natural resource management into existing and new programs.

**EXECUTIVE MANAGER**
**Ten Rivers | 2017 – 2020**

Led and transformed a significant repositioning of the business, without major disruption to service delivery. Identified new clients, and ensured continued high quality delivery across both consulting and delivery sectors of the business. Leading by example for bushfire management and mitigation programs.

continued....

- Bushfire, risk and strategic landscape management planning for large land managers and owners
- Integrated land management planning, principally fire and weed management
- Business development, and extension of environmental services across the Broadspectrum group
- Increase revenue 10-15% year on year, highest staff retention in sector of parent company
- Returning bases to operation within two days. Total clean-up effort lasted six months, costs over 5M

**NATIONAL MANAGER – ENVIRONMENTAL SERVICES**
**Broadspectrum | August 2017 – May 2019**

Seconded role to lead and transform service delivery to Broadspectrum's largest contract, Defence Base Services for the Commonwealth Dept. of Defence. A challenging role, this was a client facing, deeply involved position, but I was proud to drive consistency of service delivery of Land Management programs across WA, SA, NT, VIC & TAS (over 3M hectares of land). Operating annual budget of >$30M.

- Enhanced service delivery to save 10 – 20% on resources to land management deliverables
- Managed nine direct reports, service delivery at over fifty different locations across the country
- Led the clean-up effort following TC Marcus (in Darwin) in Feb 2019

**NATIONAL SCIENCE LEAD BUSHFIRE MANAGEMENT SERVICES**
**Transfield Services (now Broadspectrum) | September 2012 – 2017**

Developed and implemented new methods to analyse and record bushfire risk across Defence estates in WA, SA, and Victoria. Helped with creation of new entity (Ten Rivers) as a start-up venture. Client facing with challenging customer with varying expectations at the regional level. Increased service delivery by 20%

- Integrated and adaptive estate management for a diverse group of land managers, including local govt, resources industries, utility companies and Defence.
- Enhancing environmental outcomes by using smarter business-orientated techniques
- Created an external market for bushfire risk management opportunities

## PROFESSIONAL DEVELOPMENT

FIRE BEHAVIOR ANALYST
QFES Training, 2018

PLANNED BURN SUPERVISOR
Fire Management Training, 2018

CREW MEMBER – FIRE-FIGHTER
Qld Dept. of Forestry, 1994

**FIRE MANAGEMENT & ECOLOGY SPECIALIST**
**Serco Sodexo Defence Services / July 2009 – September 2012**

Developed and implemented robust measures of bushfire risk across the Defence Estate in NT, NW WA, North Qld, Northern NSW and the ACT. Evidence-based approach of risk management led to 30% increase in revenue for implementation of risk-reduction programs. Be sure to use job-specific keywords to catch your future employer's eye, and to get chosen by application tracking systems.

- Fire management planning across the Defence Estate
- Coordinating landscape management programs across the Defence Estate

**ACADEMIC**
**School of Environmental Sciences, Griffith University | 2001 – 2009**

Developed new research theme in bushfire ecology and management at the School.

Refreshed and taught courses in Botany, Ecology and Wildlife Management. Coordinated the SEQ Fire & Biodiversity Consortium, servicing LGA, Qld Parks & Wildlife Service, Qld Fire & Emergency Services, & Forestry.

- Supervised five Honours (4 – 1st Class, 1 – 2nd Class Div. A) and 2 PhD students to completion.
- Organised the 2006 International Bushfire Conference: Translating Science into Practice, held in Brisbane in July 2006. Special Edition (Vol 115) of the Proceedings of the Royal Society of Queensland followed
- Recipient of Qld Safer Community Award for Bushfire Planning

# Jay van Rijn

## SKILLS

Natural Resource Management

Subject Matter Expert ACCU & Nature Repair Market Schemes

Commercial Acumen

Legal Negotiation

HSEQ Management

## TECHNICAL SKILLS

Carbon Markets

Emerging Environmental Markets

Business Administration

## EDUCATION

BACHELOR OF SCIENCE (1st CLASS HONS)
Marine & Climate Science
Monash University 2005-2009

GUEST LECTURER (MASTERS OF SUSTAINABILITY)
University of Melbourne; Monash University 2020-2021

## CHIEF OPERATIONS OFFICER

Covalent Land Australia | Adelaide, SA

Jay has more than 15 years of experience across climate and environmental science, project delivery, commercial negotiation, operations, and sales and marketing. He has held commercial development roles at Greening Australia and South Pole, combining strong client management with technical expertise to deliver high-quality project outcomes. Jay helps deliver nature-based solutions that generate measurable impact and sustainable project returns.

## EXPERIENCE

**CHIEF OPERATIONS OFFICER**
**Covalent Land Australia | August 2023 – present**

Coordinating the scaling up of high-integrity land restoration projects through carbon and nature-based finance, while enhancing natural capital and integrated, productive land-use practices. Focused on demonstrating customer value through a leading-practice approach that embeds stakeholder engagement, risk management, and resilience initiatives into project delivery.

**DIRECTOR – COMMERCIAL DEVELOPMENT**
**Greening Australia/Canopy | March 2021 – August 2023**

Led the commercial development team and business unit of Greening Australia's environmental markets portfolio, scaling high-integrity restoration projects through carbon and nature finance while driving customer value, partnerships, and sustainable land-use outcomes.

**HEAD OF CLIMATE STRATEGY - OCEANIA**
**South Pole | September 2017 – March 2021**

Managed the development and delivery of climate strategies (including consulting and trading services) for corporate clients, aligning decarbonisation pathways with carbon market solutions and advancing net-zero commitments through high-integrity climate action.

**BUSINESS DEVELOPMENT MANAGER**
**Australian Ecosystems | Biofilta | Gardline Environmental**
**2013 – 2017**

Responsible for business development activities across environmental services and infrastructure projects, building client relationships, originating opportunities, and growing revenue in ecological restoration, urban stormwater management and coastal/marine sectors.

# Nathan Garvey

Director | Principal Advisor
Nature Positive Advisory Pty Limited

NaturePositive Advisory

## Professional Overview

Nathan is an experienced ecologist with over 25 years' practice in leading ecological assessments and approvals across eastern Australia. Nathan has delivered projects across a diverse range of sectors including mining, oil and gas, linear infrastructure, renewable energy and residential development. He has extensive experience in biodiversity assessment and approvals, including biodiversity assessment for major projects and EPBC Act referrals, and has worked on large-scale projects such as Snowy 2.0, Hunter Transmission Project, Oven Mountain Pumped Hydro, Clarrie Hall Dam, Dungowan Dam and Mole River Dam.

Nathan is one of NSW's leading experts in biodiversity approvals and offsetting and his strategic, expert advice is actively sought by public and private sector clients. His innovative, tailored, whole-of-project approach to approvals and offsets delivers solutions for our clients, saving both time and money. He works collaboratively with our project teams to ensure high quality project outcomes.

## Qualifications and licences

- Fellow of the Environment Institute of Australia and New Zealand (FEIANZ)
- Certified Environmental Practitioner (CEnVP)
- Biodiversity Assessment Method (BAM) Accredited Assessor
- Member of the Environment Institute of Australia and New Zealand (MEIANZ)
- Graduate Diploma (Biological Science), University of NSW, 2003
- Bachelor of Science, University of NSW, 2001

## Advisory Panels

- National Environmental Law Reform – Biodiversity Subject Matter Expert
- Independent Expert Advisory Panel for Mining (IEAPM)
- Independent Expert Advisory Panel for Energy Assessment (IEAPEA)

## Specialisation

- Strategic advisory
- Biodiversity assessment and approvals (State and Commonwealth)
- Biodiversity offsetting
- Natural Capital
- Nature Positive

## Work history

- Director | Principal Advisor, Nature Positive Advisory Pty Ltd (2024 – current)
- National Operations Executive – Ecology, Environmental Approvals and Engagement, WSP Australia Pty Ltd (May – September 2024)
- Associate Director | Strategic Advisor – Biodiversity and Natural Capital, EMM Consulting Pty Limited (July 2023 – May 2024)
- Associate Director | Division Leader - Bushfire, Ecology, Heritage and Spatial Solutions, Transport, Acoustics and Air Quality, EMM Consulting Pty Limited (March 2022 – June 2023)
- Associate Director | Division Leader – Bushfire, Ecology, Heritage and Spatial Solutions, EMM Consulting Pty Limited (April 2018 – March 2022)
- Associate Ecologist, EMM Consulting Pty Ltd (August 2017 – April 2018)
- Newcastle Resource Group Manager, Biosis Pty Ltd (October 2015 – August 2017)
- Senior Consultant Ecologist, Biosis Pty Ltd (February – October 2015)
- Wollongong Resource Group Manager, Biosis Pty Ltd (January 2011 – February 2015)
- Consultant Zoologist, Biosis Pty Ltd (October 2009 – December 2010)
- Zoologist, Biosis Pty Ltd (February – September 2009)
- Technical Assistant, Biosis Pty Ltd (February 2007 – February 2009)
- Project Manager and Ecologist, Cumberland Ecology Pty Ltd (2003 – 2007)
- Research Assistant, University of NSW (2001 – 2003)

## Representative experience

### Biodiversity assessments

- Starting State Assessment Cooplacurripa Biodiversity Project No.2 (Covalent Land Australia Pty Ltd)
- Upper Hunter Battery Energy Storage System and Transmission Line (North Harbour Clean Energy)
- Richmond Vale Battery Energy Storage biodiversity assessment (Vena Energy)

- Hunter Transmission Project, approvals strategy and biodiversity offset strategy, Hunter Valley NSW (EnergyCo)
- Hunter Transmission Project, preliminary biodiversity assessment (EnergyCo)
- Munmorah Biodiversity Certification (Landcom and Darkinjung Local Aboriginal Land Council)
- Prelim Options Analysis, New England Renewable Energy Zone Transmission Route Alignment (EnergyCo)
- Clarrie Hall Dam Wall Raising biodiversity assessment, Kyogle NSW (Tweed Shire Council)
- Oven Mountain Pumped Hydro biodiversity assessment including transmission lines, Lower Creek NSW (Alinta Energy, NSW)
- Central West Orana Renewable Energy Zone Transmission Corridor, NSW (WSP and EnergyCo)
- Moomba to Wilton Pipeline - Mod 3 biodiversity assessment (APA Group)
- Dungowan Dam biodiversity assessment (Water Infrastructure NSW)
- Mole River Dam, biodiversity assessment (Water Infrastructure NSW)
- Snowy 2.0, biodiversity assessment and EPBC referral, Kosciuszko National Park NSW (Snowy Hydro Ltd)
- Wee Waa Solar Farm, biodiversity assessment, Wee Waa (Overland Sun Farming)
- Junee Solar Farm Grid Connection Biodiversity Assessment, Junee (Geolyse and Terrain Solar)
- Gunnedah, Limondale, Hay and Hillston Solar Farms, biodiversity assessments, NSW (Overland Sun Farming)
- Walgett Solar Farm, biodiversity assessment and biodiversity management plan, Walgett (Geolyse and Epuron)
- Hunter Valley Operations Continuation Project, Hunter Valley NSW (Glencore)
- Dunmore Quarry, biodiversity assessment, Dunmore (Boral)
- Upper Thredbo Valley Track, Review of Environmental Factors, Thredbo (NSW National Parks and Wildlife Service)
- McPhillamys Gold Project, biodiversity assessment, Blayney (Regis Resources)
- New England Solar Farm, biodiversity assessment, Uralla (UPC Renewables)
- Mugga Quarry, biodiversity assessment and EPBC referral, Symonston (Boral)
- Gulgong Solar Project, biodiversity assessment, Gulgong (Vena Energy)
- Wagga Wagga Solar Project, biodiversity assessment, Gulgong (Vena Energy)
- Orange Grove Solar Farm, biodiversity assessment, Orange Grove (Overland Sun Farming)
- Quorn Park solar project, biodiversity assessment, Parkes (Renewable Energy Consultancy)
- Balranald Mineral Sand Mine Modification biodiversity assessment, Balranald NSW (Iluka)
- Reeves Street, Somersby: Flora and Fauna Assessment for Planning Proposal (Darkinjung LALC)
- Blueys Estate Planning Proposal, biodiversity assessment, Blueys Beach (City Plan Services)
- Coffs Harbour Bypass, biodiversity assessment and EPBC referral, NSW (Aurecon and NSW Roads and Maritime Services)
- Goonumbla Solar Farm, biodiversity assessment, Goonumbla (Geolyse and Renewable Energy Developments)
- Amended Rocky Hill Coal Project, biodiversity assessment, targeted fauna surveys and EPBC referral, Gloucester (RW Corkery & Co and Gloucester Resources Limited)
- Yarraman Abattoir and Feedlot, biodiversity impact assessment, Yarraman (KMH Environmental)
- Brandy Hill Quarry Expansion, biodiversity impact assessment, Brandy Hill (Hanson Construction Materials)
- Underground Expansion Project, biodiversity assessment and EIS for the EPBC referral, Wollongong (Hansen Bailey and Wollongong Coal)
- Nyngan Inground Storage, biodiversity assessment, Nyngan (NSW Public Works)
- Crest Road Albion Park, flora and fauna assessment, Albion Park (MMJ Wollongong and Spinitu)
- Princes Highway Upgrade, Foxground and Berry Bypass, biodiversity assessment, Foxground (AECOM and Roads and Maritime Services)
- Princes Highway Upgrade, Berry Bypass, biodiversity assessment, Berry (AECOM and Roads and Maritime Services)
- AGL Camden North Gas Project, flora and fauna assessment, Camden (AGL Upstream Investments)
- Dundas Tablelands Wind Farm, detailed flora and fauna assessment, Casterton (Origin Energy)
- Underground Expansion Project, biodiversity offset strategy, Russell Vale (Wollongong Coal)

**Biodiversity offsets**

- Kunderang Biodiversity Stewardship Agreement (Dorado)
- Pratten Biodiversity Stewardship Agreement (Dorado)
- Yarraman Biodiversity Stewardship Agreement (Dorado)
- Dog Trap Hill Biodiversity Stewardship Agreement (Woodside Pastoral)
- Woodside Biodiversity Stewardship Agreement Variation (Woodside Pastoral)
- Long Gully Farm Biodiversity Stewardship Agreement (Steve McCall)
- Queensland Pumped Hydro, Offset Technical Lead – Borumba and Pioneer Burdekin Projects (Queensland Pumped Hydro)
- Central West Orana (CWO) Renewable Energy Zone (REZ)Transmission Connection biodiversity offsets (EnergyCo)
- Tycannah East and West Biodiversity Stewardship Agreements (Dorado)
- Tumba Tops Biodiversity Stewardship Agreement (Snowy Hydro)

- Christmas Hill Biodiversity Stewardship Agreement (Snowy Hydro)
- Darkinjung Local Aboriginal Land Council Conservation Land Strategy (Darkinjung LALC)
- NSW Biodiversity Offsets Scheme: Guidance on Partial Loss (Biodiversity Conservation Division)
- Cumberland Plain Conservation Plan Biodiversity Certification Review (Biodiversity Conservation Division)
- Strategic Advice on the Biodiversity Offsets Scheme (Landcom and Biraban Local Aboriginal Land Council)
- Snowy 2.0 Transmission Connection, biodiversity offset strategy (Snowy Hydro Ltd and TransGrid)
- NSW Biodiversity Offsets Scheme Strategic Reforms, advice to Reginal NSW (Department of Regional NSW)
- Issues paper on the NSW Biodiversity Offsets Scheme (Urban Development Institute of NSW)
- Environmental Offset Calculator (WaterNSW)
- Snowy 2.0 Exploratory Works, biodiversity offset framework and strategy (Snowy Hydro Ltd)
- Gunlake Quarry, BioBanking agreement, Marulan (Gunlake Quarries)
- 33 – 35 Warradale Road, Silverdale: credit sourcing and retirement, Silverdale (SitePlus and TRN Group)
- Western Sydney Priority Growth Areas, biodiversity advice (Office of Environment and Heritage)
- Wilton Gardens and Wilton East, biodiversity offset advice and strategy, Wilton (Country Garden Australia)
- Albion Park Rail Bypass project, offset site advice, Albion Park (Shellharbour City Council)
- BioBanking Assessor services, various location in NSW (NSW Office of Environment and Heritage)
- Redgum Ridge Western Precinct, biodiversity certification, Figtree (Clifford Developments)
- Redgum Ridge Western Precinct, BioBanking Agreement, Figtree (Clifford Developments)
- 89 Port Stephens Drive Taylors Beach, BioBanking Agreement and BioBanking Statement, Taylors Beach (Port Stephens Council)
- Lots 4 and 6 DP 243079 Wilton, BioBanking Agreement, Wilton (Weaving Family Trust)
- 33 – 35 Warradale Road, Silverdale, BioBanking Statement, Silverdale (SitePlus and TRN Group)
- 33 – 35 Warradale Road, Silverdale, BioBanking Agreement, Silverdale (SitePlus and TRN Group)
- NorthConnex, biodiversity offset strategy, Sydney NSW (Lend Lease Bouyeres Joint Venture)

**Peer review, expert witness services and auditing**

- Willowtree Planning Pty Ltd vs Tweed Shire Council: Class 1 Hearing in the Land and Environment Court, Henry Lawson Drive Terranora NSW (Tweed Shire Council)
- Arbus Pottsville Pty Ltd vs Tweed Shire Council: Class 1 Hearing in the Land and Environment Court, Henry Lawson Drive Terranora NSW (Tweed Shire Council)
- Damileast Pty Ltd v Blacktown City Council: Class 3 Hearing in the Land and Environment Court, 60 Glengarrie Road, Marsden Park
- Mahers Lane Development Pty Ltd vs Tweed Shire Council: Class 1 Hearing in the Land and Environment Court, Henry Lawson Drive Terranora NSW (Tweed Shire Council)
- Variant Group Pty Ltd vs Tweed Shire Council: Class 1 Hearing in the Land and Environment Court, Boyle Avenue, Banora Point (Tweed Shire Council)
- Turner Contracting Pty Ltd vs Tweed Shire Council: Class 1 Hearing in the Land and Environment Court, 1126 Pottsville Road, Pottsville (Tweed Shire Council)
- Bullawah Wind Farm, Plain-wanderer serious and irreversible impact assessment peer review (Bullawah Wind Farm Pty Ltd)
- Oven Mountain Pumped Hydro Storage Project, Brush-tailed Rock-wallaby and Pultenaea rubescens serious and irreversible impact assessment expert review (EMM Consulting Pty Ltd)
- Independent Expert Advisory Panel for Mining: Metropolitan Mine Longwalls 312 to 316 Extraction Plan Review (Department of Planning, Housing and Infrastructure)
- Independent Expert Advisory Panel for Energy Assessment: Stratford Pumped Hydro (Department of Planning, Housing and Infrastructure) (Department of Planning, Housing and Infrastructure)
- Pottinger Wind Farm – Peer review and biodiversity advice (Department of Planning, Housing and Infrastructure)
- Valley of the Winds – Peer review and biodiversity advice (Department of Planning, Housing and Infrastructure)
- Springvale Colliery Independent Monitoring Panel – Biodiversity expert (Department of Planning, Housing and Infrastructure)
- Independent Expert Advisory Panel for Mining: Large Swamp Environmental Assessment Requirements for Extraction Plan for Metropolitan Mine Longwalls 311 to 316 (Department of Planning and Environment)
- Peer Review and Expert Advice: HumeLink Biodiversity Development Assessment Report (Department of Planning and Environment)
- Independent Expert Advisory Panel for Mining: Dendrobium Coal Mine - Longwall 19A Subsidence Management Plan (Department of Planning and Environment)
- Independent Expert Advisory Panel for Mining: Moolarben Coal Complex Stage 2 Modification 4 (Department of Planning and Environment)
- Mount Pleasant Operations independent environmental audit (MACH Energy)
- Kooragang Island Waste Emplacement facility independent environmental audit (Hunter Central Coast Development Corporation)

- UPG 72 Pty Ltd vs Blacktown City Council: Class 3 Hearing in the Land and Environment Court, Regent Street, Riverstone NSW (UPG 72 Pty Ltd)
- Snowy 2.0 Transmission Connection, biodiversity development assessment report review (Snowy Hydro Ltd and TransGrid)
- Mako Minerals Pty Ltd vs Liverpool City Council: Class 1 Hearing in the Land and Environment Court, 135 Kurrajong Rd, Prestons - Lot 103 (Liverpool City Council)
- Mako Minerals Pty Ltd vs Liverpool City Council: Class 1 Hearing in the Land and Environment Court, 125 Kurrajong Rd, Prestons - Lot 102 (Liverpool City Council)
- Austral Developers Pty Ltd vs Liverpool City Council: Class 1 Hearing in the Land and Environment Court, Ninth Avenue, Austral (Sparke Helmore Lawyers and Liverpool City Council)
- Snowy 2.0 Transmission Connection, biodiversity development assessment report review (Snowy Hydro Ltd and TransGrid)
- Cumberland Plain Conservation Plan Biodiversity Certification Review (Biodiversity Conservation Division)
- Hunter Valley Operations: proposed Striped Legless Lizard survey methods (Glencore)
- Albion Park Bypass: biodiversity stewardship site assessments for Croome Reserve and Dunmore Wetlands (Shellharbour City Council)
- Gunlake Quarry Pty Ltd vs The Minister for Planning: Class 1 Hearing in the Land and Environment Court, Modification to Consent for the Gunlake Quarry (Corrs Chambers Westgarth and Gunlake Quarry)
- IRT Culburra Beach Development Application: biodiversity assessment peer review, Culburra Beach (Illawarra Retirement Trust)
- Blueys Estate Biodiversity Assessment: peer review, Blueys Beach (City Plan Services)
- Expert review of the Addendum to NSW Biodiversity Offset Policy for Major Projects: Upland swamps impacted by longwall mining subsidence (NSW Minerals Council).
- Tarrone Gas-fired Power Station, expert witness statement, Tarrone (URS Corporation)
- Ballarat Koala Habitat Assessment, expert witness testimony to the Victorian Civil and Administrative Tribunal, Vic (VCAT)

### Ecological monitoring and management plans

- Snowy 2.0 Main Works, biodiversity monitoring plan, Kosciuszko National Park (Snowy Hydro Limited)
- Snowy 2.0 Exploratory Works, biodiversity monitoring program, Kosciuszko National Park (Snowy Hydro Limited)
- Snowy 2.0 Exploratory Works, biodiversity monitoring plan, Kosciuszko National Park (Snowy Hydro Limited)
- Dunmore Hard Rock Quarry, flora and fauna management plan, Dunmore (Boral)
- Beryl Solar Farm, biodiversity management plan, Beryl (Geolyse and Downer)
- Mona Vale Road, biodiversity monitoring plan and implementation, Sydney NSW (Roads and Maritime Services)
- Walgett Solar Farm, biodiversity management plan, Walgett (Geolyse and Epuron)
- Balickera Tunnel, targeted microbat surveys, Balickera (GHD and Hunter Water)
- Additional Crossing of the Clarence River at Grafton, flora and fauna management plan, NSW (Fulton Hogan)
- Dendrobium Mine, biodiversity management plans and monitoring (Illawarra Coal)
- Longwall 6 and 7, biodiversity and upland swamp management plans, Russell Vale (Wollongong Coal)
- NRE No. 1 Colliery Dam 6 Green and Golden Bell Frog monitoring program, Russell Vale (Wollongong Coal)
- Appin Area 9, biodiversity management plan, Appin (Illawarra Coal)
- Shell Port Kembla, Green and Golden Bell Frog management plan, Port Kembla NSW (URS Australia)
- Penshurst Wind Farm, targeted surveys for the Brolga and Southern Bent-wing Bat, Penshurst (RES Australia)
- Holcim Colac Quarry, Coorangamite Water Skink translocation plan, Colac (Holcim Australia)
- Victorian Desalination Plant, targeted surveys for the Growling Grass Frog, Wonthagi (GHD)

### Industry panels and working groups

- Member of the Independent Expert Advisory Panel for Energy Assessments (Department of Planning, Housing and Infrastructure)
- Member of the Independent Expert Advisory Panel for Mining (Department of Planning, Housing and Infrastructure)
- Participant in the Taskforce for Environmental Law Reforms on Australia's new national environmental laws (representing UDIA)

## Publications and presentations

- Are we serious about closing the gap? The role of biodiversity offsets in promoting and thwarting economic and social self-determination for First Nations people. Presentation at the EIANZ National Biodiversity Offsets Conference, July 2024.
- Creating value from natural capital: Biodiversity offsets and the double dividend. Presentation to the Jana Investors Annual Conference, November 2022.
- Disaster to recovery: A tail of the Smoky Mouse. Presentation to the EIANZ Annual Conference October 2020.
- BAM – where does fauna fit into the requirements of the new Biodiversity Conservation Act? Presentation to the Ecological Consultants Association of NSW annual conference, 2017.
- The Biodiversity Conservation Act 2016: a new framework for biodiversity assessment in NSW and how you can be prepared. Presentation to EMM breakfast seminar, Sydney, 2017.
- An assessment of changes in the extent and distribution of upland swamps in relation to longwall mining. Report to Wollongong Coal, 2015.

- The assessment and offsetting of indirect impacts. Presentation at the Biodiversity Offsetting for Mining, Infrastructure and Urban Development Conference, Sydney, 2015.
- Coastal upland swamps and longwall mining. Presentation to the Australian Institute of Mining and Metallurgy, Wollongong, 2014.
- Garvey, N, Ben-Ami, D, Ramp, D & Croft, D 2010, Survival behaviour of swamp wallabies during prescribed burning and wildfire, Wildlife Research 37(1), pp. 1–12.

# Appendix B: Site Assessment Report Requirements

| Reference in the Method | Requirement | Where addressed in the SAR |
|---|---|---|
| 35(1)(a) | details of the project area, including:<br>(i) the name and address of the property or properties included in the project area<br>(ii) the lot and file numbers of the land parcels included in the project area | Section 2 and Table 3 |
| 35(1)(b) | a map of the project area that:<br>(i) shows the activity areas and any sub-areas that are within the project area; and<br>(ii) is consistent with the Mapping Guidelines | Figure 1 |
| 35(1)(c) | details of how each activity area satisfies the criteria for an activity area and the data relied upon to establish this. | Section 2, Table 5 |
| 35(1)(d) | a description of any engagement with relevant Indigenous representatives or other relevant Aboriginal persons or Torres Strait Islanders for the project area that was undertaken for the purposes of section 28 | Section 3 |
| 35(1)(e) | any areas of the project that:<br>(i) are subject to Indigenous land interests; or<br>(ii) are culturally sensitive areas | No areas were identified that are subject to Indigenous land interests or are culturally sensitive areas. |
| 35(1)(f) | a description of any other engagement with relevant Aboriginal persons or Torres Strait Islanders for the project area as part of the SSA, including relation to culturally significant entities | Section 3 |
| 35(1)(g) | for each activity area - the starting ecosystem condition state | Section 5.5, Table 22 |

| Reference in the Method | Requirement | Where addressed in the SAR |
|---|---|---|
| 35(1)(h) | for each activity area:<br>(i) the starting values for each indicator for ecosystem condition<br>(ii) the starting ecosystem condition score<br>(iii) the forecast ecosystem condition score<br>(iv) the starting contribution to biodiversity persistence score<br>(v) the forecast contribution to biodiversity persistence score | Section 5.4, Table 19<br>Section 5.6, Table 23 |
| 35(1)(i) | for the replanting project as a whole:<br>(i) the starting aggregate ecosystem condition score<br>(ii) the forecast aggregate ecosystem condition score<br>(iii) the starting aggregate contribution to biodiversity persistence score<br>(iv) the forecast aggregate contribution to biodiversity persistence score | Section 5.6, Table 23 |
| 35(1)(j) | the data obtained from the assessment that was relied upon to determine the starting ecosystem condition state of each activity area | Field data using the template for data submission is submitted with this SAR for each activity area.<br><br>Reference ecosystems were assigned using PCT profiles (Appendix D) and as detailed in Section 5.1 |
| 35(1)(k) | the data obtained from the assessment that was relied upon to determine starting values of each indicator for the ecosystem condition of each activity area | Field data using the template for data submission is submitted with this SAR for each activity area. |

| Reference in the Method | Requirement | Where addressed in the SAR |
|---|---|---|
| 35(1)(l) | details of the permanent sampling plots for each activity area, including:<br>(i) the location of each sampling plot<br>(ii) a map of the activity area that:<br>(A) shows the sampling plots; and<br>(B) is consistent with the Mapping Guidelines<br>(iii) the location of the permanent markers for each sampling plot<br>(iv) the location of the centre line for each sampling plot<br>(v) a description of how the plots were determined<br>(vi) the 6 photos of each plot taken in accordance with section 3 of Schedule 5 | Plot locations are provided in Appendix E and shown in Figure 6.<br><br>Locations of permanent markers, centre line are provided as spatial files to support this SAR.<br><br>Description of plot placement and established are detailed in Section 5.3.2<br><br>Plot photos are provided in Appendix F. |
| 35(1)(m) | the reference ecosystem identified for each activity area or sub-area, including:<br>(i) details of the process undertaken to identify the applicable reference ecosystem for each activity area or sub-area<br>(ii) the data obtained from this process and relied upon to identify the applicable reference ecosystem for each activity area or sub-area | Section 5.1 |
| 35(1)(n) | the benchmark values determined in accordance with paragraph 30(1)(b), including:<br>(i) details of who these benchmark values were selected or established, including the process and, where relevant, the sources used; and<br>(ii) if the benchmark values were established in accordance with Schedule 2:<br>(A) evidence demonstrating the process in Schedule 2 was complied with; and<br>(B) details of the survey sites used in this process; and<br>(C) justification for why a benchmark value for the indicator or sub-indicator from the Approved benchmark source list was not appropriate | Section 5.2 |

| Reference in the Method | Requirement | Where addressed in the SAR |
|---|---|---|
| 35(1)(o) | details of any potential threats to the likelihood of the project outcome being achieved that were identified as part of the SSA | Section 4.5 |
| 35(1)(p) | details of any significant hydrological features that were identified as part of the SSA | Section 4.7.2 |
| 35(1)(q) | details of any threatened species or ecological communities that were identified as part of the SSA | Section 4.7.1 |
| 35(1)(r) | details of the historic drivers of change associated with biodiversity in the native species in the project area, including any significant disturbances to any of the activity areas | Section 4.2, 4.3 and 4.4 |
| 35(1)(s) | details of any natural regeneration that was identified as part of the SSA | Section 4.7.3 |
| 35(1)(t) | details of any covenants or other legal encumbrances that were identified as part of the SSA | Section 4.7.4 |
| 35(1)(u) | a statement that the site assessment report was prepared by, or certified by, a suitably qualified person | Refer to certification section at the front of report. |
| 35(1)(v) | a statement that the person responsible for undertaking the field survey for SSA is a suitably qualified person | Refer to certification section at the front of report. |
| 35(1)(w) | the names and contact details of the person or persons | Table 1 |
| 35(1)(x) | evidence of their relevant qualifications or experience | CVs are provided in Appendix A |

# Appendix C: EPBC Act Protected Matters Report

# EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 23-Jun-2026

Summary
Details
- Matters of NES
- Other Matters Protected by the EPBC Act
- Extra Information

Caveat
Acknowledgements

# Summary

## Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

| | |
|---|---|
| World Heritage Properties: | None |
| National Heritage Places: | None |
| Wetlands of International Importance (Ramsar | None |
| Great Barrier Reef Marine Park: | None |
| Commonwealth Marine Area: | None |
| Listed Threatened Ecological Communities: | 6 |
| Listed Threatened Species: | 57 |
| Listed Migratory Species: | 10 |

## Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at https://www.dcceew.gov.au/parks-heritage/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

| | |
|---|---|
| Commonwealth Lands: | None |
| Commonwealth Heritage Places: | None |
| Listed Marine Species: | 20 |
| Whales and Other Cetaceans: | None |
| Critical Habitats: | None |
| Commonwealth Reserves Terrestrial: | None |
| Australian Marine Parks: | None |
| Habitat Critical to the Survival of Marine Turtles: | None |

## Extra Information

This part of the report provides information that may also be relevant to the area you have

| | |
|---|---|
| State and Territory Reserves: | 5 |
| Regional Forest Agreements: | 1 |
| Nationally Important Wetlands: | None |
| EPBC Act Referrals: | 2 |
| Key Ecological Features (Marine): | None |
| Biologically Important Areas: | None |
| Bioregional Assessments: | None |
| Geological and Bioregional Assessments: | None |

# Details

## Matters of National Environmental Significance

### Listed Threatened Ecological Communities [ Resource Information ]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

| Community Name | Threatened Category | Presence Text |
|---|---|---|
| Ben Halls Gap Sphagnum Moss Cool Temperate Rainforest | Critically Endangered | Community may occur within area |
| Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland | Endangered | Community may occur within area |
| Lowland Rainforest of Subtropical Australia | Critically Endangered | Community likely to occur within area |
| New England Peppermint (Eucalyptus nova-anglica) Grassy Woodlands | Critically Endangered | Community may occur within area |
| Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions | Endangered | Community may occur within area |
| White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland | Critically Endangered | Community may occur within area |

### Listed Threatened Species [ Resource Information ]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

| Scientific Name | Threatened Category | Presence Text |
|---|---|---|
| BIRD | | |
| Anthochaera phrygia | | |
| Regent Honeyeater [82338] | Critically Endangered | Foraging, feeding or related behaviour likely to occur within area |
| Aphelocephala leucopsis | | |
| Southern Whiteface [529] | Vulnerable | Species or species habitat may occur within area |

| Scientific Name | Threatened Category | Presence Text |
| --- | --- | --- |
| Atrichornis rufescens<br>Rufous Scrub-bird [655] | Endangered | Species or species habitat may occur within area |
| Botaurus poiciloptilus<br>Australasian Bittern [1001] | Endangered | Species or species habitat may occur within area |
| Calidris acuminata<br>Sharp-tailed Sandpiper [874] | Vulnerable | Species or species habitat may occur within area |
| Calidris ferruginea<br>Curlew Sandpiper [856] | Critically Endangered | Species or species habitat may occur within area |
| Calyptorhynchus lathami lathami<br>South-eastern Glossy Black-Cockatoo [67036] | Vulnerable | Species or species habitat likely to occur within area |
| Climacteris picumnus victoriae<br>Brown Treecreeper (south-eastern) [67062] | Vulnerable | Species or species habitat likely to occur within area |
| Erythrotriorchis radiatus<br>Red Goshawk [942] | Endangered | Species or species habitat may occur within area |
| Falco hypoleucos<br>Grey Falcon [929] | Vulnerable | Species or species habitat likely to occur within area |
| Gallinago hardwickii<br>Latham's Snipe, Japanese Snipe [863] | Vulnerable | Species or species habitat may occur within area |
| Grantiella picta<br>Painted Honeyeater [470] | Vulnerable | Species or species habitat likely to occur within area |
| Hirundapus caudacutus<br>White-throated Needletail [682] | Vulnerable | Species or species habitat likely to occur within area |

| Scientific Name | Threatened Category | Presence Text |
|---|---|---|
| Lathamus discolor | | |
| Swift Parrot [744] | Critically Endangered | Species or species habitat may occur within area |
| Melanodryas cucullata cucullata | | |
| South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093] | Endangered | Species or species habitat may occur within area |
| Neophema chrysostoma | | |
| Blue-winged Parrot [726] | Vulnerable | Species or species habitat may occur within area |
| Rostratula australis | | |
| Australian Painted Snipe [77037] | Endangered | Species or species habitat likely to occur within area |
| Stagonopleura guttata | | |
| Diamond Firetail [59398] | Vulnerable | Species or species habitat likely to occur within area |
| CRUSTACEAN | | |
| Euastacus maccai | | |
| Terrestrial Crayfish [83149] | Endangered | Species or species habitat may occur within area |
| Euastacus spinichelatus | | |
| Small Crayfish [83157] | Endangered | Species or species habitat likely to occur within area |
| FROG | | |
| Litoria booroolongensis | | |
| Booroolong Frog [1844] | Endangered | Species or species habitat likely to occur within area |
| Litoria daviesae | | |
| Davies' Tree Frog [78964] | Vulnerable | Species or species habitat likely to occur within area |
| Mixophyes balbus | | |
| Stuttering Frog, Southern Barred Frog (in Victoria) [1942] | Vulnerable | Species or species habitat likely to occur within area |
| Philoria sphagnicola | | |
| Sphagnum Frog [59709] | Vulnerable | Species or species habitat may occur within area |
| MAMMAL | | |

| Scientific Name | Threatened Category | Presence Text |
|---|---|---|
| Chalinolobus dwyeri | | |
| Large-eared Pied Bat, Large Pied Bat [183] | Endangered | Species or species habitat likely to occur within area |
| Dasyurus maculatus maculatus (SE mainland population) | | |
| Spotted-tail Quoll, Spot-tailed Quoll, Tiger Quoll (southeastern mainland population) [75184] | Endangered | Species or species habitat likely to occur within area |
| Notamacropus parma | | |
| Parma Wallaby [89289] | Vulnerable | Species or species habitat likely to occur within area |
| Nyctophilus corbeni | | |
| Corben's Long-eared Bat, South-eastern Long-eared Bat [83395] | Vulnerable | Species or species habitat may occur within area |
| Petauroides volans | | |
| Greater Glider (southern and central) [254] | Endangered | Species or species habitat likely to occur within area |
| Petaurus australis australis | | |
| Yellow-bellied Glider (south-eastern) [87600] | Vulnerable | Species or species habitat likely to occur within area |
| Petrogale penicillata | | |
| Brush-tailed Rock-wallaby [225] | Vulnerable | Species or species habitat likely to occur within area |
| Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) | | |
| Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104] | Endangered | Species or species habitat likely to occur within area |
| Potorous tridactylus tridactylus | | |
| Long-nosed Potoroo (northern) [66645] | Vulnerable | Species or species habitat likely to occur within area |
| Pseudomys novaehollandiae | | |
| Pookila, New Holland Mouse [96] | Vulnerable | Species or species habitat likely to occur within area |
| Pseudomys oralis | | |
| Hastings River Mouse, Koontoo [98] | Endangered | Species or species habitat likely to occur within area |

| Scientific Name | Threatened Category | Presence Text |
|---|---|---|
| Pteropus poliocephalus<br>Grey-headed Flying-fox [186] | Vulnerable | Foraging, feeding or related behaviour known to occur within area |
| PLANT | | |
| Arthraxon hispidus<br>Hairy-joint Grass [9338] | Vulnerable | Species or species habitat likely to occur within area |
| Callistemon pungens<br>[55581] | Vulnerable | Species or species habitat likely to occur within area |
| Coleus nitidus listed as Plectranthus nitidus<br>Nightcap Plectranthus, Silver Plectranthus [91380] | Endangered | Species or species habitat may occur within area |
| Cryptostylis hunteriana<br>Leafless Tongue-orchid [19533] | Vulnerable | Species or species habitat may occur within area |
| Cynanchum elegans<br>White-flowered Wax Plant [12533] | Endangered | Species or species habitat likely to occur within area |
| Dichanthium setosum<br>bluegrass [14159] | Vulnerable | Species or species habitat likely to occur within area |
| Eucalyptus glaucina<br>Slaty Red Gum [5670] | Vulnerable | Species or species habitat may occur within area |
| Eucalyptus nicholii<br>Narrow-leaved Peppermint, Narrow-leaved Black Peppermint [20992] | Vulnerable | Species or species habitat likely to occur within area |
| Euphrasia arguta<br>[4325] | Critically Endangered | Species or species habitat likely to occur within area |
| Haloragis exalata subsp. velutina<br>Tall Velvet Sea-berry [16839] | Vulnerable | Species or species habitat likely to occur within area |

| Scientific Name | Threatened Category | Presence Text |
|---|---|---|
| Persicaria elatior<br>Knotweed, Tall Knotweed [5831] | Vulnerable | Species or species habitat may occur within area |
| Rhizanthella slateri<br>Eastern Underground Orchid [11768] | Endangered | Species or species habitat may occur within area |
| Rhodamnia rubescens<br>Scrub Turpentine, Brown Malletwood [15763] | Critically Endangered | Species or species habitat likely to occur within area |
| Rhodomyrtus psidioides<br>Native Guava [19162] | Critically Endangered | Species or species habitat may occur within area |
| Syzygium paniculatum<br>Magenta Lilly Pilly, Magenta Cherry, Daguba, Scrub Cherry, Creek Lilly Pilly, Brush Cherry [20307] | Vulnerable | Species or species habitat may occur within area |
| Thesium australe<br>Austral Toadflax, Toadflax [15202] | Vulnerable | Species or species habitat likely to occur within area |
| Vincetoxicum woollsii listed as Tylophora woollsii<br>Cryptic Forest Twiner [40080] | Endangered | Species or species habitat may occur within area |
| REPTILE | | |
| Coeranoscincus reticulatus<br>Three-toed Snake-tooth Skink [59628] | Vulnerable | Species or species habitat may occur within area |
| Eulamprus kosciuskoi<br>Alpine Water Skink [59693] | Vulnerable | Species or species habitat may occur within area |
| Myuchelys purvisi<br>Manning River Saw-Shelled Turtle, Purvis' Turtle [89459] | Endangered | Species or species habitat likely to occur within area |
| Saltuarius moritzi<br>New England Leaf-tailed Gecko, Moritz's Leaf-tailed Gecko [89490] | Endangered | Species or species habitat may occur within area |
| Listed Migratory Species | | [ Resource Information ] |

| Scientific Name | Threatened Category | Presence Text |
|---|---|---|
| Migratory Marine Birds | | |
| Apus pacificus | | |
| Fork-tailed Swift [678] | | Species or species habitat likely to occur within area |
| Migratory Terrestrial Species | | |
| Cuculus optatus | | |
| Oriental Cuckoo, Horsfield's Cuckoo [86651] | | Species or species habitat may occur within area |
| Hirundapus caudacutus | | |
| White-throated Needletail [682] | Vulnerable | Species or species habitat likely to occur within area |
| Motacilla flava | | |
| Yellow Wagtail [644] | | Species or species habitat may occur within area |
| Migratory Wetlands Species | | |
| Actitis hypoleucos | | |
| Common Sandpiper [59309] | | Species or species habitat may occur within area |
| Calidris acuminata | | |
| Sharp-tailed Sandpiper [874] | Vulnerable | Species or species habitat may occur within area |
| Calidris ferruginea | | |
| Curlew Sandpiper [856] | Critically Endangered | Species or species habitat may occur within area |
| Calidris melanotos | | |
| Pectoral Sandpiper [858] | | Species or species habitat may occur within area |
| Gallinago hardwickii | | |
| Latham's Snipe, Japanese Snipe [863] | Vulnerable | Species or species habitat may occur within area |
| Pandion haliaetus | | |
| Osprey [952] | | Species or species habitat may occur within area |

## Other Matters Protected by the EPBC Act

| Listed Marine Species | | [ Resource Information ] |
|---|---|---|
| Scientific Name | Threatened Category | Presence Text |
| Bird | | |
| Actitis hypoleucos<br>Common Sandpiper [59309] | | Species or species habitat may occur within area |
| Apus pacificus<br>Fork-tailed Swift [678] | | Species or species habitat likely to occur within area overfly marine area |
| Bubulcus ibis as Ardea ibis<br>Cattle Egret [66521] | | Species or species habitat may occur within area overfly marine area |
| Calidris acuminata<br>Sharp-tailed Sandpiper [874] | Vulnerable | Species or species habitat may occur within area |
| Calidris ferruginea<br>Curlew Sandpiper [856] | Critically Endangered | Species or species habitat may occur within area overfly marine area |
| Calidris melanotos<br>Pectoral Sandpiper [858] | | Species or species habitat may occur within area overfly marine area |
| Gallinago hardwickii<br>Latham's Snipe, Japanese Snipe [863] | Vulnerable | Species or species habitat may occur within area overfly marine area |
| Haliaeetus leucogaster<br>White-bellied Sea-Eagle [943] | | Species or species habitat likely to occur within area |
| Hirundapus caudacutus<br>White-throated Needletail [682] | Vulnerable | Species or species habitat likely to occur within area overfly marine area |

| Scientific Name | Threatened Category | Presence Text |
| --- | --- | --- |
| [Lathamus discolor](#)<br>Swift Parrot [744] | Critically Endangered | Species or species habitat may occur within area overfly marine area |
| [Merops ornatus](#)<br>Rainbow Bee-eater [670] | | Species or species habitat may occur within area overfly marine area |
| [Monarcha melanopsis](#)<br>Black-faced Monarch [609] | | Species or species habitat likely to occur within area overfly marine area |
| [Motacilla flava](#)<br>Yellow Wagtail [644] | | Species or species habitat may occur within area overfly marine area |
| [Myiagra cyanoleuca](#)<br>Satin Flycatcher [612] | | Species or species habitat likely to occur within area overfly marine area |
| [Neophema chrysostoma](#)<br>Blue-winged Parrot [726] | Vulnerable | Species or species habitat may occur within area overfly marine area |
| [Pandion haliaetus](#)<br>Osprey [952] | | Species or species habitat may occur within area |
| [Pterodroma cervicalis](#)<br>White-necked Petrel [59642] | | Species or species habitat may occur within area |
| [Rhipidura rufifrons](#)<br>Rufous Fantail [592] | | Species or species habitat likely to occur within area overfly marine area |
| [Rostratula australis as Rostratula benghalensis (sensu lato)](#)<br>Australian Painted Snipe [77037] | Endangered | Species or species habitat likely to occur within area overfly marine area |

| Scientific Name | Threatened Category | Presence Text |
|---|---|---|
| Symposiachrus trivirgatus as Monarcha trivirgatus | | |
| Spectacled Monarch [83946] | | Species or species habitat likely to occur within area overfly marine area |

## Extra Information

### State and Territory Reserves [ Resource Information ]

| Protected Area Name | Reserve Type | State |
|---|---|---|
| Barakee | National Park | NSW |
| Barrakee | State Conservation Area | NSW |
| Bretti | Nature Reserve | NSW |
| Bugan | Nature Reserve | NSW |
| Coco Creek | Flora Reserve | NSW |

### Regional Forest Agreements [ Resource Information ]

Note that all areas with completed RFAs have been included. Please see the associated resource information for specific caveats and use limitations associated with RFA boundary information.

| RFA Name | State |
|---|---|
| Lower North East | New South Wales |

### EPBC Act Referrals [ Resource Information ]

| Title of referral | Reference | Referral Outcome | Assessment Status |
|---|---|---|---|
| **Not controlled action** | | | |
| Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia | 2015/7522 | Not Controlled Action | Completed |
| **Not controlled action (particular manner)** | | | |
| Aerial baiting for wild dog control | 2006/2713 | Not Controlled Action (Particular Manner) | Post-Approval |

# Caveat

## 1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

## 2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data is available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance on the contents of this report.

## 3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions when time permits.

## 4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded breeding sites; and
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

# Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact us page.

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# Appendix D: Plant Community Type Profile Reports

# BioNet Vegetation Classification - Community Profile Report

***Plant Community Type ID (PCT ID):*** 3076

***PCT Name:*** Hunter Valley Whalebone Dry Rainforest
***Classification Confidence Level:*** 2-High
***Total Number of Replicates:*** 23
***Number of Primary Replicates:*** 21
***Number of Secondary Replicates:*** 2
***Vegetation Description:*** Mid-high to tall, mid-dense to dense rainforest, or occasionally very tall sclerophyll open forest with a mid-dense to dense rainforest sub-canopy. This PCT occurs in gullies or on lower slopes of hills surrounding the Hunter valley between Muswellbrook and Singleton and hills in the Manning valley north of Gloucester. The canopy composition is diverse and variable, however very frequently includes Mallotus philippinensis and Streblus brunonianus, which often have a high cover. Other tree species in the canopy or mid-stratum commonly include Notelaea longifolia, Alchornea ilicifolia, Capparis arborea, Claoxylon australe and Hibiscus heterophyllus, occasionally with Alectryon subcinereus. Where eucalypts are present as emergents or in the canopy, a very wide range of species occur rarely, the most frequent being Corymbia maculata, Eucalyptus acmenoides and Eucalyptus saligna. Vines are usually prominent, very frequent species being Pandorea pandorana, Cayratia clematidea and Geitonoplesium cymosum, commonly with Cissus antarctica. Mid-stratum shrubs very frequently include Pittosporum multiflorum and Breynia oblongifolia. The ground layer is sparse to mid-dense, most frequently including ferns Pellaea falcata, Adiantum aethiopicum and Adiantum formosum and grass Oplismenus aemulus. This PCT occurs mainly in warm, moderately dry locations receiving 800-1040 mm mean annual rainfall, at low to mid-elevations of 50-310 meres asl. It occurs on a wide range of sedimentary and metasedimentary lithologies, sometimes associated with ignimbrite in the Hunter valley. It often occurs as linear patches along steep or rocky gullies where water flow is intermittent. It grades into any of a number of grassy eucalypt forest PCTs on the slopes away from the creeks, for example PCTs 3240 and 3241, or in the Hunter valley, PCT 3446. The boundary with adjacent grassy forest PCTs may be abrupt where the area is frequently burnt.
***Vegetation Formation:*** Rainforests;
***Vegetation Class:*** Dry Rainforests;
***IBRA Bioregion(s):*** NSW North Coast; Sydney Basin;
***IBRA Sub-region(s):*** Ellerston; Karuah Manning; Mummel Escarpment; Upper Hunter; Hunter; Yengo;
***LGA:*** CESSNOCK; DUNGOG; MAITLAND; MID-COAST; MUSWELLBROOK; SINGLETON;
***Elevation (m) (Min, Median, Max):*** 26.7 180.7 390.3
***Annual Rainfall (mm) (Min, Median, Max):*** 713 906 1078
***Annual Mean Temperature (deg C) (Min, Median, Max):*** 15.23 16.66 17.75
***Median Native Species Richness per plot:*** 40
***TEC Assessed:*** Has associated TEC
***TEC List:*** Listed BC Act,V: Lower Hunter Valley Dry Rainforest in the Sydney Basin and NSW North Coast Bioregions (Part); Listed BC Act,E: Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions (Part); Listed EPBC Act,CE: Lowland Rainforest of Subtropical Australia (Part);
***TEC Comments:*** (Comment TEC1) Relates to the NSW Lower Hunter Valley Dry Rainforest TEC where it occurs on Carboniferous sediments in the south-eastern Barrington Fall region within the stated LGAs (LGA boundaries as at date of Final Determination) as per paragraph 7 of the Final Determination. (Comment TEC2) Relates to the NSW Lowland Rainforest TEC only where it is (quote) transitional to (end quote) or (quote) in conjunction with (end quote) a PCT associated with SubAlliances listed in paragraph 4 of the Final Determination. The set of PCTs that meet this condition in the Final Determination (paragraph 5) are annotated with a statement indicating an association with a Primary SubAlliance. A site must also satisfy the elevation thresholds that apply to bioregions (below 600 m asl for NSW North Coast bioregion, below 350 m asl for Sydney Basin bioregion, IBRA Version 4.0) as per paragraph 1. (Comment TEC3) Relates to the Commonwealth Lowland Rainforest of Subtropical Australia TEC as it is associated with one of the SubAlliances listed in Section 6 of the Listing Advice. A patch must occur at an elevation generally less than 300 m asl on soils derived from basalt or alluvium or enriched rhyolitic soils or basaltically enriched metasediments, and satisfy condition thresholds as per Section 5 of the Listing Advice.
***PCT Percent Cleared:*** 54.79
***PCT Definition Status:*** Approved

## Species By Growth Form Group

| Growth Form Group | Species | Median cover score | Frequency |
|---|---|---|---|
| Fern (EG) | Pellaea falcata | 2 | 81 |
| Fern (EG) | Adiantum aethiopicum | 2 | 58 |
| Fern (EG) | Adiantum formosum | 3 | 39 |
| Fern (EG) | Pellaea paradoxa | 2 | 39 |
| Fern (EG) | Doodia aspera | 2 | 34 |
| Fern (EG) | Adiantum hispidulum | 2 | 29 |
| Fern (EG) | Pyrrosia confluens var. confluens | 2 | 15 |
| Fern (EG) | Pyrrosia rupestris | 1 | 10 |
| Fern (EG) | Adiantum diaphanum | 2 | 5 |

| | | | |
|---|---|---|---|
| Fern (EG) | Adiantum silvaticum | 1 | 5 |
| Fern (EG) | Arthropteris tenella | 2 | 5 |
| Fern (EG) | Asplenium flabellifolium | 1 | 5 |
| Fern (EG) | Blechnum nudum | 1 | 5 |
| Fern (EG) | Cyclosorus dentatus | 2 | 5 |
| Fern (EG) | Lastreopsis acuminata | 2 | 5 |
| Fern (EG) | Lastreopsis decomposita | 2 | 5 |
| Fern (EG) | Lindsaea linearis | 1 | 5 |
| Fern (EG) | Pteridium esculentum | 1 | 5 |
| Fern (EG) | Pteris umbrosa | 2 | 5 |
| Forb (FG) | Pseuderanthemum variabile | 2 | 62 |
| Forb (FG) | Commelina cyanea | 2 | 39 |
| Forb (FG) | Plectranthus parviflorus | 2 | 39 |
| Forb (FG) | Dichondra repens | 2 | 24 |
| Forb (FG) | Gymnostachys anceps | 1 | 24 |
| Forb (FG) | Sigesbeckia orientalis subsp. orientalis | 1 | 24 |
| Forb (FG) | Stellaria flaccida | 1 | 24 |
| Forb (FG) | Aneilema acuminatum | 2 | 20 |
| Forb (FG) | Aneilema biflorum | 1 | 15 |
| Forb (FG) | Nyssanthes diffusa | 1 | 15 |
| Forb (FG) | Plantago debilis | 1 | 15 |
| Forb (FG) | Solanum prinophyllum | 1 | 15 |
| Forb (FG) | Dianella caerulea | 1 | 10 |
| Forb (FG) | Dichondra sp. Inglewood | 2 | 10 |
| Forb (FG) | Einadia hastata | 1 | 10 |
| Forb (FG) | Oxalis chnoodes | 1 | 10 |
| Forb (FG) | Viola hederacea | 2 | 10 |
| Forb (FG) | Brunonia australis | 1 | 5 |
| Forb (FG) | Brunoniella australis | 1 | 5 |
| Forb (FG) | Dendrobium speciosum | 1 | 5 |
| Forb (FG) | Desmodium gunnii | 1 | 5 |
| Forb (FG) | Galium leiocarpum | 1 | 5 |
| Forb (FG) | Geranium homeanum | 2 | 5 |
| Forb (FG) | Hackelia latifolia | 1 | 5 |
| Forb (FG) | Hydrocotyle sibthorpioides | 1 | 5 |
| Forb (FG) | Lobelia purpurascens | 1 | 5 |
| Forb (FG) | Nyssanthes erecta | 1 | 5 |
| Forb (FG) | Oxytes brachypoda | 1 | 5 |
| Forb (FG) | Parietaria debilis | 2 | 5 |
| Forb (FG) | Peperomia blanda var. floribunda | 1 | 5 |
| Forb (FG) | Peperomia tetraphylla | 2 | 5 |
| Forb (FG) | Plectranthus graveolens | 2 | 5 |
| Forb (FG) | Pollia crispata | 2 | 5 |

| | | | |
|---|---|---|---|
| Forb (FG) | Ranunculus sessiliflorus | 1 | 5 |
| Forb (FG) | Senecio hispidulus | 1 | 5 |
| Forb (FG) | Senecio vagus | 1 | 5 |
| Forb (FG) | Tephrosia brachyodon | 2 | 5 |
| Forb (FG) | Urtica incisa | 1 | 5 |
| Grass & grasslike (GG) | Oplismenus aemulus | 3 | 58 |
| Grass & grasslike (GG) | Oplismenus imbecillis | 2 | 48 |
| Grass & grasslike (GG) | Cyperus tetraphyllus | 1 | 39 |
| Grass & grasslike (GG) | Microlaena stipoides | 1 | 24 |
| Grass & grasslike (GG) | Carex appressa | 1 | 15 |
| Grass & grasslike (GG) | Cyperus enervis | 2 | 15 |
| Grass & grasslike (GG) | Carex longebrachiata | 2 | 10 |
| Grass & grasslike (GG) | Echinopogon ovatus | 1 | 10 |
| Grass & grasslike (GG) | Gahnia aspera | 1 | 10 |
| Grass & grasslike (GG) | Lomandra longifolia | 2 | 10 |
| Grass & grasslike (GG) | Austrostipa ramosissima | 2 | 5 |
| Grass & grasslike (GG) | Carex brunnea | 2 | 5 |
| Grass & grasslike (GG) | Cyperus imbecillis | 2 | 5 |
| Grass & grasslike (GG) | Cyperus mirus | 2 | 5 |
| Grass & grasslike (GG) | Cyperus sanguinolentus | 1 | 5 |
| Grass & grasslike (GG) | Digitaria parviflora | 1 | 5 |
| Grass & grasslike (GG) | Entolasia marginata | 1 | 5 |
| Grass & grasslike (GG) | Imperata cylindrica | 1 | 5 |
| Grass & grasslike (GG) | Lepidosperma laterale | 1 | 5 |
| Grass & grasslike (GG) | Lomandra filiformis | 1 | 5 |
| Grass & grasslike (GG) | Lomandra spicata | 1 | 5 |
| Grass & grasslike (GG) | Panicum pygmaeum | 3 | 5 |
| Grass & grasslike (GG) | Scleria mackaviensis | 1 | 5 |
| Other (OG) | Pandorea pandorana subsp. pandorana | 1 | 91 |
| Other (OG) | Cayratia clematidea | 2 | 77 |
| Other (OG) | Geitonoplesium cymosum | 1 | 72 |
| Other (OG) | Cissus antarctica | 2 | 67 |
| Other (OG) | Tetrastigma nitens | 2 | 58 |
| Other (OG) | Maclura cochinchinensis | 1 | 53 |
| Other (OG) | Parsonsia straminea | 1 | 53 |
| Other (OG) | Gynochthodes jasminoides | 1 | 48 |
| Other (OG) | Dioscorea transversa | 2 | 39 |
| Other (OG) | Eustrephus latifolius | 1 | 39 |
| Other (OG) | Jasminum volubile | 2 | 34 |
| Other (OG) | Stephania japonica var. discolor | 1 | 34 |
| Other (OG) | Aphanopetalum resinosum | 2 | 24 |
| Other (OG) | Legnephora moorei | 1 | 24 |
| Other (OG) | Parsonsia velutina | 2 | 24 |

| | | | |
|---|---|---|---|
| Other (OG) | Smilax australis | 1 | 24 |
| Other (OG) | Tylophora barbata | 1 | 24 |
| Other (OG) | Celastrus subspicata | 1 | 20 |
| Other (OG) | Clematis aristata | 1 | 20 |
| Other (OG) | Deeringia amaranthoides | 1 | 15 |
| Other (OG) | Marsdenia flavescens | 1 | 15 |
| Other (OG) | Ripogonum brevifolium | 1 | 15 |
| Other (OG) | Sarcopetalum harveyanum | 1 | 15 |
| Other (OG) | Austrosteenisia blackii var. blackii | 3 | 10 |
| Other (OG) | Cissus hypoglauca | 2 | 10 |
| Other (OG) | Clematicissus opaca | 1 | 10 |
| Other (OG) | Clematis glycinoides | 1 | 10 |
| Other (OG) | Desmodium varians | 1 | 10 |
| Other (OG) | Marsdenia rostrata | 1 | 10 |
| Other (OG) | Parsonsia lanceolata | 1 | 10 |
| Other (OG) | Sicyos australis | 1 | 10 |
| Other (OG) | Trophis scandens subsp. scandens | 1 | 10 |
| Other (OG) | Calochlaena dubia | 1 | 5 |
| Other (OG) | Calystegia marginata | 2 | 5 |
| Other (OG) | Dendrobium fairfaxii | 1 | 5 |
| Other (OG) | Dendrobium linguiforme | 1 | 5 |
| Other (OG) | Embelia australiana | 2 | 5 |
| Other (OG) | Glycine clandestina | 1 | 5 |
| Other (OG) | Glycine tabacina | 1 | 5 |
| Other (OG) | Marsdenia lloydii | 1 | 5 |
| Other (OG) | Marsdenia pleiadenia | 1 | 5 |
| Other (OG) | Neoachmandra cunninghamii | 1 | 5 |
| Other (OG) | Passiflora cinnabarina | 2 | 5 |
| Other (OG) | Passiflora herbertiana subsp. herbertiana | 2 | 5 |
| Other (OG) | Plectorrhiza tridentata | 1 | 5 |
| Other (OG) | Sarcochilus hillii | 1 | 5 |
| Other (OG) | Sarcochilus parviflorus | 2 | 5 |
| Other (OG) | Tylophora grandiflora | 1 | 5 |
| Other (OG) | Tylophora paniculata | 1 | 5 |
| Shrub (SG) | Pittosporum multiflorum | 2 | 81 |
| Shrub (SG) | Breynia oblongifolia | 1 | 72 |
| Shrub (SG) | Alchornea ilicifolia | 2 | 62 |
| Shrub (SG) | Capparis arborea | 2 | 62 |
| Shrub (SG) | Claoxylon australe | 2 | 58 |
| Shrub (SG) | Hibiscus heterophyllus subsp. heterophyllus | 2 | 58 |
| Shrub (SG) | Alectryon subcinereus | 2 | 53 |
| Shrub (SG) | Croton verreauxii | 2 | 43 |
| Shrub (SG) | Backhousia myrtifolia | 3 | 39 |

| | | | |
|---|---|---|---|
| Shrub (SG) | Elaeodendron australe | 1 | 39 |
| Shrub (SG) | Diospyros australis | 1 | 34 |
| Shrub (SG) | Melicope micrococca | 1 | 34 |
| Shrub (SG) | Pittosporum revolutum | 1 | 29 |
| Shrub (SG) | Abutilon oxycarpum | 1 | 24 |
| Shrub (SG) | Denhamia silvestris | 1 | 24 |
| Shrub (SG) | Hymenosporum flavum | 1 | 24 |
| Shrub (SG) | Melaleuca styphelioides | 2 | 24 |
| Shrub (SG) | Myrsine variabilis | 1 | 24 |
| Shrub (SG) | Pittosporum undulatum | 1 | 20 |
| Shrub (SG) | Rhodamnia rubescens | 2 | 20 |
| Shrub (SG) | Solanum stelligerum | 2 | 20 |
| Shrub (SG) | Syzygium australe | 2 | 20 |
| Shrub (SG) | Phyllanthus gunnii | 1 | 15 |
| Shrub (SG) | Trema tomentosa var. aspera | 1 | 15 |
| Shrub (SG) | Acronychia oblongifolia | 2 | 10 |
| Shrub (SG) | Alectryon subdentatus f. subdentatus | 1 | 10 |
| Shrub (SG) | Callistemon salignus | 4 | 10 |
| Shrub (SG) | Ficus coronata | 3 | 10 |
| Shrub (SG) | Homalanthus populifolius | 1 | 10 |
| Shrub (SG) | Melicytus dentatus | 3 | 10 |
| Shrub (SG) | Sarcomelicope simplicifolia subsp. simplicifolia | 3 | 10 |
| Shrub (SG) | Solanum brownii | 1 | 10 |
| Shrub (SG) | Wilkiea huegeliana | 1 | 10 |
| Shrub (SG) | Acacia falcata | 2 | 5 |
| Shrub (SG) | Acacia implexa | 1 | 5 |
| Shrub (SG) | Acacia parvipinnula | 1 | 5 |
| Shrub (SG) | Actephila lindleyi | 1 | 5 |
| Shrub (SG) | Alyxia ruscifolia | 2 | 5 |
| Shrub (SG) | Aphananthe philippinensis | 1 | 5 |
| Shrub (SG) | Bursaria spinosa | 2 | 5 |
| Shrub (SG) | Commersonia fraseri | 1 | 5 |
| Shrub (SG) | Dodonaea viscosa | 3 | 5 |
| Shrub (SG) | Eupomatia laurina | 2 | 5 |
| Shrub (SG) | Exocarpos cupressiformis | 1 | 5 |
| Shrub (SG) | Myrsine howittiana | 1 | 5 |
| Shrub (SG) | Pisonia umbellifera | 2 | 5 |
| Shrub (SG) | Psydrax odorata | 1 | 5 |
| Shrub (SG) | Rubus moluccanus | 1 | 5 |
| Shrub (SG) | Sambucus gaudichaudiana | 1 | 5 |
| Shrub (SG) | Sannantha crassa | 1 | 5 |
| Shrub (SG) | Solanum aviculare | 1 | 5 |
| Shrub (SG) | Stenocarpus salignus | 1 | 5 |

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|---|---|---|---|
| Tree (TG) | Mallotus philippensis | 3 | 86 |
| Tree (TG) | Streblus brunonianus | 3 | 81 |
| Tree (TG) | Notelaea longifolia | 1 | 67 |
| Tree (TG) | Clerodendrum tomentosum | 1 | 62 |
| Tree (TG) | Elaeocarpus obovatus | 1 | 43 |
| Tree (TG) | Guioa semiglauca | 1 | 43 |
| Tree (TG) | Olea paniculata | 3 | 43 |
| Tree (TG) | Alectryon tomentosus | 2 | 34 |
| Tree (TG) | Scolopia braunii | 1 | 34 |
| Tree (TG) | Alphitonia excelsa | 1 | 29 |
| Tree (TG) | Dendrocnide excelsa | 3 | 29 |
| Tree (TG) | Baloghia inophylla | 3 | 24 |
| Tree (TG) | Drypetes deplanchei | 2 | 24 |
| Tree (TG) | Melia azedarach | 1 | 24 |
| Tree (TG) | Pararchidendron pruinosum var. pruinosum | 2 | 24 |
| Tree (TG) | Planchonella australis | 3 | 24 |
| Tree (TG) | Dysoxylum fraserianum | 1 | 20 |
| Tree (TG) | Brachychiton populneus | 1 | 15 |
| Tree (TG) | Corymbia maculata | 2 | 15 |
| Tree (TG) | Diploglottis australis | 1 | 15 |
| Tree (TG) | Eucalyptus acmenoides | 3 | 15 |
| Tree (TG) | Eucalyptus saligna | 4 | 15 |
| Tree (TG) | Geijera salicifolia | 1 | 15 |
| Tree (TG) | Rhysotoechia bifoliolata subsp. bifoliolata | 1 | 15 |
| Tree (TG) | Acacia maidenii | 3 | 10 |
| Tree (TG) | Backhousia sciadophora | 5 | 10 |
| Tree (TG) | Cleistanthus cunninghamii | 1 | 10 |
| Tree (TG) | Daphnandra apatela | 3 | 10 |
| Tree (TG) | Dendrocnide photinophylla | 3 | 10 |
| Tree (TG) | Ehretia acuminata var. acuminata | 2 | 10 |
| Tree (TG) | Eucalyptus canaliculata <--> punctata | 2 | 10 |
| Tree (TG) | Eucalyptus crebra | 3 | 10 |
| Tree (TG) | Eucalyptus tereticornis | 1 | 10 |
| Tree (TG) | Euroschinus falcatus var. falcatus | 1 | 10 |
| Tree (TG) | Ficus macrophylla subsp. macrophylla | 4 | 10 |
| Tree (TG) | Ficus rubiginosa | 1 | 10 |
| Tree (TG) | Acacia melanoxylon | 1 | 5 |
| Tree (TG) | Argyrodendron actinophyllum | 1 | 5 |
| Tree (TG) | Brachychiton discolor | 3 | 5 |
| Tree (TG) | Croton insularis | 3 | 5 |
| Tree (TG) | Cryptocarya glaucescens | 1 | 5 |
| Tree (TG) | Cryptocarya microneura | 1 | 5 |
| Tree (TG) | Cryptocarya obovata | 1 | 5 |

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|---|---|---|---|
| Tree (TG) | Cupaniopsis parvifolia | 1 | 5 |
| Tree (TG) | Daphnandra melasmena | 1 | 5 |
| Tree (TG) | Diospyros pentamera | 1 | 5 |
| Tree (TG) | Dysoxylum rufum | 1 | 5 |
| Tree (TG) | Elattostachys nervosa | 1 | 5 |
| Tree (TG) | Endiandra sieberi | 1 | 5 |
| Tree (TG) | Eucalyptus largeana | 3 | 5 |
| Tree (TG) | Eucalyptus moluccana | 1 | 5 |
| Tree (TG) | Eucalyptus placita | 2 | 5 |
| Tree (TG) | Eucalyptus punctata | 3 | 5 |
| Tree (TG) | Eucalyptus siderophloia | 2 | 5 |
| Tree (TG) | Eucalyptus umbra | 2 | 5 |
| Tree (TG) | Ficus obliqua | 3 | 5 |
| Tree (TG) | Glochidion ferdinandi | 2 | 5 |
| Tree (TG) | Lophostemon confertus | 1 | 5 |
| Tree (TG) | Mischocarpus pyriformis | 1 | 5 |
| Tree (TG) | Notelaea microcarpa | 1 | 5 |
| Tree (TG) | Podocarpus elatus | 1 | 5 |
| Tree (TG) | Polyscias elegans | 1 | 5 |
| Tree (TG) | Toona ciliata | 1 | 5 |

# *BioNet Vegetation Classification - Community Profile Report*

***Plant Community Type ID (PCT ID):*** 3240

***PCT Name:*** Lower North Escarpment Red Gum Grassy Forest
***Classification Confidence Level:*** 4-Low
***Total Number of Replicates:*** 53
***Number of Primary Replicates:*** 45
***Number of Secondary Replicates:*** 8
***Vegetation Description:*** A tall to very tall sclerophyll open forest with a mid-stratum of Allocasuarina and soft-leaved shrubs and a ground cover of grasses and graminoids on the escarpment of the lower north coast, primarily on the steep southern fall of Mount Royal and in the Manning River hinterland. The canopy very frequently includes stringybarks (commonly Eucalyptus eugenioides), apples (Angophora floribunda, Angophora subvelutina) and red gums (Eucalyptus tereticornis, Eucalyptus blakelyi, Eucalyptus amplifolia). Grey gums (Eucalyptus biturbinata or Eucalyptus canaliculata) are also occasionally present in localised areas. A small tree layer comprising she-oaks (Allocasuarina torulosa or Allocasuarina littoralis) is almost always present. The shrub layer is very sparse and very frequently includes scattered Breynia oblongifolia, Sigesbeckia orientalis subsp. orientalis and the scrambler Rubus parvifolius. The mid-dense ground layer typically includes graminoids, soft-leaved forbs and twiners. Lobelia purpurascens is almost always present with Imperata cylindrica, Desmodium varians, Dichondra repens, Cymbopogon refractus, Lomandra longifolia, Dianella caerulea and Hardenbergia violacea all very frequent. This PCT typically occurs warm, moist climate on mid to upper slopes up to an elevation of 790 metres asl on metasedimentary substrates. It overlaps floristically with PCT 3251 which differs in that mahoganies are very frequent, ironbarks are common and it occurs on coastal hills to the east of this PCT. It grades into wetter eucalypt open forests on more sheltered sites on the escarpment.
***Vegetation Formation:*** Wet Sclerophyll Forests (Grassy sub-formation);
***Vegetation Class:*** Northern Hinterland Wet Sclerophyll Forests;
***IBRA Bioregion(s):*** New England Tablelands; NSW North Coast;
***IBRA Sub-region(s):*** Walcha Plateau; Comboyne Plateau; Macleay Gorges; Mummel Escarpment; Tomalla; Upper Hunter;
***LGA:*** ARMIDALE REGIONAL; DUNGOG; MID-COAST; SINGLETON; UPPER HUNTER; WALCHA;
***Elevation (m) (Min, Median, Max):*** 230.0 557.7 920.8
***Annual Rainfall (mm) (Min, Median, Max):*** 840 1017 1344
***Annual Mean Temperature (deg C) (Min, Median, Max):*** 13.40 15.26 17.04
***Median Native Species Richness per plot:*** 47
***TEC Assessed:*** No associated TEC
***TEC List:***
***TEC Comments:***
***PCT Percent Cleared:*** 18.17
***PCT Definition Status:*** Approved

## *Species By Growth Form Group*

| Growth Form Group | Species | Median cover score | Frequency |
|---|---|---|---|
| Fern (EG) | Cheilanthes sieberi subsp. sieberi | 1 | 49 |
| Fern (EG) | Pellaea falcata | 1 | 43 |
| Fern (EG) | Pteridium esculentum | 1 | 20 |
| Fern (EG) | Cheilanthes distans | 1 | 18 |
| Fern (EG) | Adiantum aethiopicum | 2 | 14 |
| Fern (EG) | Pellaea paradoxa | 1 | 14 |
| Fern (EG) | Doodia aspera | 1 | 12 |
| Fern (EG) | Adiantum hispidulum | 2 | 5 |
| Fern (EG) | Asplenium flabellifolium | 1 | 5 |
| Fern (EG) | Botrychium australe | 1 | 5 |
| Fern (EG) | Cheilanthes austrotenuifolia | 2 | 5 |
| Fern (EG) | Pteris tremula | 1 | 3 |
| Fern (EG) | Pyrrosia confluens var. confluens | 1 | 3 |
| Fern (EG) | Pyrrosia rupestris | 1 | 3 |
| Forb (FG) | Lobelia purpurascens | 2 | 92 |
| Forb (FG) | Dichondra repens | 2 | 83 |
| Forb (FG) | Dianella caerulea | 1 | 78 |
| Forb (FG) | Sigesbeckia orientalis subsp. orientalis | 2 | 78 |

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|---|---|---|---|
| Forb (FG) | Oxytes brachypoda | 2 | 65 |
| Forb (FG) | Vernonia cinerea | 2 | 65 |
| Forb (FG) | Plectranthus parviflorus | 1 | 63 |
| Forb (FG) | Desmodium rhytidophyllum | 2 | 52 |
| Forb (FG) | Plantago debilis | 1 | 47 |
| Forb (FG) | Solanum prinophyllum | 1 | 40 |
| Forb (FG) | Desmodium gunnii | 2 | 34 |
| Forb (FG) | Dianella revoluta | 1 | 34 |
| Forb (FG) | Lagenophora stipitata | 2 | 29 |
| Forb (FG) | Daucus glochidiatus | 2 | 25 |
| Forb (FG) | Euchiton sphaericus | 1 | 25 |
| Forb (FG) | Geranium solanderi | 2 | 25 |
| Forb (FG) | Hypericum gramineum | 1 | 25 |
| Forb (FG) | Veronica plebeia | 1 | 25 |
| Forb (FG) | Viola betonicifolia | 1 | 23 |
| Forb (FG) | Opercularia aspera | 1 | 20 |
| Forb (FG) | Ajuga australis | 1 | 18 |
| Forb (FG) | Galium leiocarpum | 2 | 18 |
| Forb (FG) | Opercularia diphylla | 1 | 18 |
| Forb (FG) | Oxalis chnoodes | 1 | 18 |
| Forb (FG) | Oxalis perennans | 2 | 18 |
| Forb (FG) | Wahlenbergia stricta | 1 | 18 |
| Forb (FG) | Arthropodium milleflorum | 1 | 16 |
| Forb (FG) | Hydrocotyle laxiflora | 2 | 16 |
| Forb (FG) | Poranthera microphylla | 1 | 16 |
| Forb (FG) | Brachyscome microcarpa | 1 | 14 |
| Forb (FG) | Brunoniella australis | 2 | 14 |
| Forb (FG) | Commelina cyanea | 1 | 14 |
| Forb (FG) | Crassula sieberiana | 1 | 14 |
| Forb (FG) | Galium gaudichaudii | 1 | 14 |
| Forb (FG) | Geranium potentilloides | 2 | 14 |
| Forb (FG) | Hydrocotyle sibthorpioides | 1 | 14 |
| Forb (FG) | Lagenophora gracilis | 1 | 14 |
| Forb (FG) | Ranunculus lappaceus | 1 | 14 |
| Forb (FG) | Rostellularia adscendens | 1 | 14 |
| Forb (FG) | Senecio prenanthoides | 1 | 14 |
| Forb (FG) | Arthropodium minus | 2 | 12 |
| Forb (FG) | Dianella longifolia | 1 | 12 |
| Forb (FG) | Einadia hastata | 1 | 12 |
| Forb (FG) | Geranium homeanum | 2 | 12 |
| Forb (FG) | Gonocarpus tetragynus | 1 | 12 |
| Forb (FG) | Urtica incisa | 1 | 12 |
| Forb (FG) | Wahlenbergia communis | 2 | 12 |

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|---|---|---|---|
| Forb (FG) | Wahlenbergia gracilis | 1 | 12 |
| Forb (FG) | Cynoglossum australe | 2 | 9 |
| Forb (FG) | Euchiton involucratus | 2 | 9 |
| Forb (FG) | Euchiton japonicus | 1 | 9 |
| Forb (FG) | Galium ciliare | 2 | 9 |
| Forb (FG) | Hydrocotyle acutiloba | 1 | 9 |
| Forb (FG) | Mentha diemenica | 1 | 9 |
| Forb (FG) | Picris angustifolia | 2 | 9 |
| Forb (FG) | Senecio hispidulus | 1 | 9 |
| Forb (FG) | Stackhousia viminea | 1 | 9 |
| Forb (FG) | Viola hederacea | 1 | 9 |
| Forb (FG) | Arthropodium sp. South-east Highlands | 2 | 7 |
| Forb (FG) | Asperula conferta | 2 | 7 |
| Forb (FG) | Galium leptogonium | 1 | 7 |
| Forb (FG) | Gonocarpus teucrioides | 1 | 7 |
| Forb (FG) | Hackelia latifolia | 1 | 7 |
| Forb (FG) | Mentha satureioides | 1 | 7 |
| Forb (FG) | Opercularia hispida | 2 | 7 |
| Forb (FG) | Oxalis exilis | 2 | 7 |
| Forb (FG) | Pseuderanthemum variabile | 1 | 7 |
| Forb (FG) | Rumex brownii | 1 | 7 |
| Forb (FG) | Scaevola albida | 1 | 7 |
| Forb (FG) | Solanum opacum | 1 | 7 |
| Forb (FG) | Wahlenbergia planiflora | 1 | 7 |
| Forb (FG) | Caladenia carnea | 2 | 5 |
| Forb (FG) | Centella asiatica | 1 | 5 |
| Forb (FG) | Desmodium brachypodum | 1 | 5 |
| Forb (FG) | Dichondra sp. Inglewood | 2 | 5 |
| Forb (FG) | Gonocarpus humilis | 1 | 5 |
| Forb (FG) | Hybanthus stellarioides | 2 | 5 |
| Forb (FG) | Hypericum japonicum | 1 | 5 |
| Forb (FG) | Lespedeza juncea subsp. sericea | 2 | 5 |
| Forb (FG) | Opercularia varia | 1 | 5 |
| Forb (FG) | Plectranthus graveolens | 2 | 5 |
| Forb (FG) | Podolepis neglecta | 1 | 5 |
| Forb (FG) | Senecio diaschides | 2 | 5 |
| Forb (FG) | Senecio pinnatifolius | 2 | 5 |
| Forb (FG) | Senecio quadridentatus | 1 | 5 |
| Forb (FG) | Stellaria flaccida | 2 | 5 |
| Forb (FG) | Veronica calycina | 1 | 5 |
| Forb (FG) | Vittadinia sulcata | 1 | 5 |
| Forb (FG) | Xerochrysum bracteatum | 1 | 5 |
| Forb (FG) | Acaena echinata | 2 | 3 |

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|---|---|---|---|
| Forb (FG) | Acaena novae-zelandiae | 1 | 3 |
| Forb (FG) | Acaena ovina | 2 | 3 |
| Forb (FG) | Acianthus exsertus | 2 | 3 |
| Forb (FG) | Acianthus fornicatus | 1 | 3 |
| Forb (FG) | Aneilema acuminatum | 1 | 3 |
| Forb (FG) | Arrhenechthites mixta | 1 | 3 |
| Forb (FG) | Boerhavia dominii | 2 | 3 |
| Forb (FG) | Boronia polygalifolia | 1 | 3 |
| Forb (FG) | Brachyscome angustifolia | 2 | 3 |
| Forb (FG) | Brachyscome multifida | 1 | 3 |
| Forb (FG) | Brachyscome nova-anglica | 1 | 3 |
| Forb (FG) | Brachyscome spathulata | 2 | 3 |
| Forb (FG) | Calandrinia pickeringii | 1 | 3 |
| Forb (FG) | Calotis lappulacea | 1 | 3 |
| Forb (FG) | Centratherum riparium | 1 | 3 |
| Forb (FG) | Chrysocephalum apiculatum | 2 | 3 |
| Forb (FG) | Craspedia variabilis | 1 | 3 |
| Forb (FG) | Crotalaria montana var. angustifolia | 1 | 3 |
| Forb (FG) | Dianella tasmanica | 2 | 3 |
| Forb (FG) | Dysphania carinata | 1 | 3 |
| Forb (FG) | Epilobium billardierianum | 1 | 3 |
| Forb (FG) | Erodium crinitum | 1 | 3 |
| Forb (FG) | Galium binifolium | 1 | 3 |
| Forb (FG) | Glossocardia bidens | 1 | 3 |
| Forb (FG) | Hackelia suaveolens | 1 | 3 |
| Forb (FG) | Haloragis heterophylla | 1 | 3 |
| Forb (FG) | Hybanthus vernonii | 1 | 3 |
| Forb (FG) | Hydrocotyle geraniifolia | 1 | 3 |
| Forb (FG) | Hydrocotyle pedicellosa | 2 | 3 |
| Forb (FG) | Hydrocotyle tripartita | 1 | 3 |
| Forb (FG) | Lobelia pedunculata | 2 | 3 |
| Forb (FG) | Phyllanthus virgatus | 1 | 3 |
| Forb (FG) | Plantago varia | 1 | 3 |
| Forb (FG) | Polygala japonica | 1 | 3 |
| Forb (FG) | Pomax umbellata | 1 | 3 |
| Forb (FG) | Pterostylis longifolia | 1 | 3 |
| Forb (FG) | Pterostylis nutans | 1 | 3 |
| Forb (FG) | Pterostylis parviflora | 2 | 3 |
| Forb (FG) | Pterostylis pedunculata | 1 | 3 |
| Forb (FG) | Scutellaria humilis | 1 | 3 |
| Forb (FG) | Senecio bipinnatisectus | 1 | 3 |
| Forb (FG) | Senecio biserratus | 1 | 3 |
| Forb (FG) | Senecio minimus | 2 | 3 |

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|---|---|---|---|
| Forb (FG) | Senecio tenuiflorus | 1 | 3 |
| Forb (FG) | Solanum pungetium | 1 | 3 |
| Forb (FG) | Stellaria pungens | 1 | 3 |
| Forb (FG) | Stylidium graminifolium | 1 | 3 |
| Forb (FG) | Swainsona galegifolia | 1 | 3 |
| Forb (FG) | Vittadinia cuneata | 1 | 3 |
| Forb (FG) | Vittadinia hispidula | 2 | 3 |
| Forb (FG) | Vittadinia tenuissima | 1 | 3 |
| Forb (FG) | Wahlenbergia littoricola | 1 | 3 |
| Forb (FG) | Wahlenbergia luteola | 1 | 3 |
| Forb (FG) | Zornia dyctiocarpa var. dyctiocarpa | 1 | 3 |
| Grass & grasslike (GG) | Imperata cylindrica | 3 | 80 |
| Grass & grasslike (GG) | Cymbopogon refractus | 2 | 78 |
| Grass & grasslike (GG) | Lomandra longifolia | 2 | 76 |
| Grass & grasslike (GG) | Microlaena stipoides | 2 | 65 |
| Grass & grasslike (GG) | Oplismenus aemulus | 2 | 65 |
| Grass & grasslike (GG) | Themeda triandra | 3 | 58 |
| Grass & grasslike (GG) | Lomandra filiformis | 1 | 54 |
| Grass & grasslike (GG) | Poa labillardierei var. labillardierei | 3 | 49 |
| Grass & grasslike (GG) | Lepidosperma laterale | 1 | 38 |
| Grass & grasslike (GG) | Poa sieberiana | 2 | 34 |
| Grass & grasslike (GG) | Sorghum leiocladum | 2 | 32 |
| Grass & grasslike (GG) | Digitaria parviflora | 2 | 29 |
| Grass & grasslike (GG) | Echinopogon ovatus | 2 | 29 |
| Grass & grasslike (GG) | Carex breviculmis | 1 | 27 |
| Grass & grasslike (GG) | Digitaria ramularis | 2 | 27 |
| Grass & grasslike (GG) | Cyperus laevis | 1 | 25 |
| Grass & grasslike (GG) | Oplismenus imbecillis | 2 | 25 |
| Grass & grasslike (GG) | Panicum effusum | 2 | 25 |
| Grass & grasslike (GG) | Eragrostis leptostachya | 2 | 23 |
| Grass & grasslike (GG) | Scleria mackaviensis | 1 | 20 |
| Grass & grasslike (GG) | Lomandra multiflora subsp. multiflora | 1 | 18 |
| Grass & grasslike (GG) | Aristida ramosa | 2 | 16 |
| Grass & grasslike (GG) | Echinopogon caespitosus | 1 | 16 |
| Grass & grasslike (GG) | Rytidosperma longifolium | 2 | 16 |
| Grass & grasslike (GG) | Austrostipa rudis | 2 | 14 |
| Grass & grasslike (GG) | Panicum simile | 1 | 14 |
| Grass & grasslike (GG) | Carex inversa | 2 | 12 |
| Grass & grasslike (GG) | Cyperus gracilis | 2 | 12 |
| Grass & grasslike (GG) | Dichelachne micrantha | 1 | 12 |
| Grass & grasslike (GG) | Entolasia marginata | 1 | 12 |
| Grass & grasslike (GG) | Lomandra confertifolia | 2 | 12 |
| Grass & grasslike (GG) | Rytidosperma racemosum | 2 | 12 |

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|---|---|---|---|
| Grass & grasslike (GG) | Sporobolus creber | 2 | 12 |
| Grass & grasslike (GG) | Elymus scaber | 1 | 9 |
| Grass & grasslike (GG) | Entolasia stricta | 2 | 9 |
| Grass & grasslike (GG) | Austrostipa verticillata | 2 | 7 |
| Grass & grasslike (GG) | Cyperus imbecillis | 2 | 7 |
| Grass & grasslike (GG) | Dichelachne rara | 2 | 7 |
| Grass & grasslike (GG) | Juncus usitatus | 1 | 7 |
| Grass & grasslike (GG) | Sporobolus elongatus | 1 | 7 |
| Grass & grasslike (GG) | Austrostipa ramosissima | 1 | 5 |
| Grass & grasslike (GG) | Carex incomitata | 1 | 5 |
| Grass & grasslike (GG) | Carex longebrachiata | 2 | 5 |
| Grass & grasslike (GG) | Cenchrus caliculatus | 1 | 5 |
| Grass & grasslike (GG) | Chloris truncata | 2 | 5 |
| Grass & grasslike (GG) | Dichanthium sericeum | 1 | 5 |
| Grass & grasslike (GG) | Gahnia aspera | 2 | 5 |
| Grass & grasslike (GG) | Anisopogon avenaceus | 2 | 3 |
| Grass & grasslike (GG) | Aristida gracilipes | 1 | 3 |
| Grass & grasslike (GG) | Aristida vagans | 1 | 3 |
| Grass & grasslike (GG) | Bothriochloa macra | 2 | 3 |
| Grass & grasslike (GG) | Capillipedium spicigerum | 1 | 3 |
| Grass & grasslike (GG) | Carex appressa | 2 | 3 |
| Grass & grasslike (GG) | Cyperus tetraphyllus | 1 | 3 |
| Grass & grasslike (GG) | Dichelachne parva | 1 | 3 |
| Grass & grasslike (GG) | Digitaria brownii | 1 | 3 |
| Grass & grasslike (GG) | Digitaria diffusa | 2 | 3 |
| Grass & grasslike (GG) | Gahnia sieberiana | 2 | 3 |
| Grass & grasslike (GG) | Lomandra spicata | 1 | 3 |
| Grass & grasslike (GG) | Poa costiniana | 4 | 3 |
| Grass & grasslike (GG) | Rytidosperma pallidum | 1 | 3 |
| Other (OG) | Desmodium varians | 2 | 78 |
| Other (OG) | Hardenbergia violacea | 1 | 74 |
| Other (OG) | Glycine clandestina | 2 | 63 |
| Other (OG) | Hibbertia scandens | 1 | 63 |
| Other (OG) | Geitonoplesium cymosum | 1 | 52 |
| Other (OG) | Glycine tabacina | 2 | 47 |
| Other (OG) | Clematis aristata | 1 | 36 |
| Other (OG) | Billardiera scandens | 1 | 25 |
| Other (OG) | Pandorea pandorana subsp. pandorana | 1 | 25 |
| Other (OG) | Cayratia clematidea | 1 | 23 |
| Other (OG) | Cissus antarctica | 1 | 23 |
| Other (OG) | Eustrephus latifolius | 1 | 20 |
| Other (OG) | Clematis glycinoides | 1 | 18 |
| Other (OG) | Clematicissus opaca | 1 | 16 |

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|---|---|---|---|
| Other (OG) | Glycine microphylla | 2 | 14 |
| Other (OG) | Jasminum volubile | 1 | 9 |
| Other (OG) | Cymbidium suave | 1 | 7 |
| Other (OG) | Muellerina celastroides | 1 | 7 |
| Other (OG) | Passiflora herbertiana subsp. herbertiana | 1 | 7 |
| Other (OG) | Tetrastigma nitens | 1 | 7 |
| Other (OG) | Amyema congener subsp. congener | 1 | 5 |
| Other (OG) | Cissus hypoglauca | 2 | 5 |
| Other (OG) | Dendrophthoe vitellina | 1 | 5 |
| Other (OG) | Maclura cochinchinensis | 1 | 5 |
| Other (OG) | Calochlaena dubia | 1 | 3 |
| Other (OG) | Macrozamia communis | 1 | 3 |
| Other (OG) | Marsdenia flavescens | 1 | 3 |
| Other (OG) | Muellerina eucalyptoides | 1 | 3 |
| Other (OG) | Parsonsia purpurascens | 1 | 3 |
| Other (OG) | Parsonsia straminea | 1 | 3 |
| Other (OG) | Parsonsia velutina | 1 | 3 |
| Other (OG) | Passiflora cinnabarina | 1 | 3 |
| Other (OG) | Stephania japonica var. discolor | 1 | 3 |
| Other (OG) | Tylophora paniculata | 1 | 3 |
| Shrub (SG) | Rubus parvifolius | 1 | 72 |
| Shrub (SG) | Breynia oblongifolia | 1 | 69 |
| Shrub (SG) | Denhamia silvestris | 1 | 40 |
| Shrub (SG) | Solanum stelligerum | 2 | 36 |
| Shrub (SG) | Persoonia linearis | 1 | 34 |
| Shrub (SG) | Acacia implexa | 1 | 29 |
| Shrub (SG) | Olearia viscidula | 1 | 25 |
| Shrub (SG) | Indigofera australis | 1 | 23 |
| Shrub (SG) | Solanum brownii | 1 | 23 |
| Shrub (SG) | Exocarpos cupressiformis | 1 | 18 |
| Shrub (SG) | Pittosporum undulatum | 1 | 18 |
| Shrub (SG) | Ozothamnus diosmifolius | 1 | 16 |
| Shrub (SG) | Acacia irrorata | 2 | 14 |
| Shrub (SG) | Pittosporum revolutum | 1 | 12 |
| Shrub (SG) | Hibbertia obtusifolia | 1 | 9 |
| Shrub (SG) | Leucopogon lanceolatus | 1 | 9 |
| Shrub (SG) | Myrsine variabilis | 1 | 9 |
| Shrub (SG) | Persoonia oleoides | 1 | 9 |
| Shrub (SG) | Pittosporum multiflorum | 1 | 9 |
| Shrub (SG) | Cassinia quinquefaria | 1 | 7 |
| Shrub (SG) | Eremophila debilis | 1 | 7 |
| Shrub (SG) | Jacksonia scoparia | 1 | 7 |
| Shrub (SG) | Persoonia media | 1 | 7 |

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|---|---|---|---|
| Shrub (SG) | Polyscias sambucifolia | 1 | 7 |
| Shrub (SG) | Alectryon subcinereus | 1 | 5 |
| Shrub (SG) | Cassinia aculeata | 1 | 5 |
| Shrub (SG) | Diospyros australis | 2 | 5 |
| Shrub (SG) | Exocarpos strictus | 2 | 5 |
| Shrub (SG) | Myoporum montanum | 1 | 5 |
| Shrub (SG) | Ozothamnus rufescens | 1 | 5 |
| Shrub (SG) | Persoonia conjuncta | 1 | 5 |
| Shrub (SG) | Persoonia levis | 2 | 5 |
| Shrub (SG) | Phyllanthus gunnii | 1 | 5 |
| Shrub (SG) | Pimelea curviflora | 3 | 5 |
| Shrub (SG) | Podolobium ilicifolium | 2 | 5 |
| Shrub (SG) | Psychotria loniceroides | 1 | 5 |
| Shrub (SG) | Solanum amblymerum | 1 | 5 |
| Shrub (SG) | Solanum curvicuspe | 2 | 5 |
| Shrub (SG) | Trema tomentosa var. aspera | 1 | 5 |
| Shrub (SG) | Abutilon oxycarpum | 2 | 3 |
| Shrub (SG) | Acacia floribunda | 1 | 3 |
| Shrub (SG) | Acacia longifolia | 2 | 3 |
| Shrub (SG) | Acacia longissima | 1 | 3 |
| Shrub (SG) | Callistemon salignus | 1 | 3 |
| Shrub (SG) | Calotis dentex | 1 | 3 |
| Shrub (SG) | Capparis arborea | 1 | 3 |
| Shrub (SG) | Cassinia leptocephala | 1 | 3 |
| Shrub (SG) | Cassinia uncata | 1 | 3 |
| Shrub (SG) | Claoxylon australe | 1 | 3 |
| Shrub (SG) | Clerodendrum floribundum var. floribundum | 1 | 3 |
| Shrub (SG) | Daviesia genistifolia | 1 | 3 |
| Shrub (SG) | Daviesia latifolia | 1 | 3 |
| Shrub (SG) | Dodonaea viscosa | 1 | 3 |
| Shrub (SG) | Goodia lotifolia | 1 | 3 |
| Shrub (SG) | Hakea eriantha | 1 | 3 |
| Shrub (SG) | Hibbertia linearis | 3 | 3 |
| Shrub (SG) | Hibiscus heterophyllus subsp. heterophyllus | 1 | 3 |
| Shrub (SG) | Leucopogon juniperinus | 1 | 3 |
| Shrub (SG) | Melichrus urceolatus | 1 | 3 |
| Shrub (SG) | Myrsine howittiana | 1 | 3 |
| Shrub (SG) | Olearia elliptica subsp. elliptica | 1 | 3 |
| Shrub (SG) | Persoonia lanceolata | 1 | 3 |
| Shrub (SG) | Pimelea ligustrina | 1 | 3 |
| Shrub (SG) | Pimelea linifolia | 1 | 3 |
| Shrub (SG) | Pimelea neo-anglica | 1 | 3 |
| Shrub (SG) | Rhodamnia rubescens | 1 | 3 |

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|---|---|---|---|
| Shrub (SG) | Rubus rosifolius | 1 | 3 |
| Shrub (SG) | Senna barronfieldii | 1 | 3 |
| Shrub (SG) | Teucrium junceum | 1 | 3 |
| Tree (TG) | Allocasuarina torulosa | 3 | 89 |
| Tree (TG) | Eucalyptus eugenioides | 3 | 65 |
| Tree (TG) | Eucalyptus tereticornis | 3 | 56 |
| Tree (TG) | Angophora floribunda | 2 | 45 |
| Tree (TG) | Acacia maidenii | 1 | 34 |
| Tree (TG) | Angophora subvelutina | 2 | 25 |
| Tree (TG) | Eucalyptus biturbinata | 3 | 25 |
| Tree (TG) | Brachychiton populneus | 1 | 18 |
| Tree (TG) | Clerodendrum tomentosum | 1 | 16 |
| Tree (TG) | Eucalyptus canaliculata | 3 | 16 |
| Tree (TG) | Alphitonia excelsa | 1 | 14 |
| Tree (TG) | Notelaea longifolia | 1 | 14 |
| Tree (TG) | Eucalyptus blakelyi | 3 | 12 |
| Tree (TG) | Acacia blakei | 1 | 9 |
| Tree (TG) | Acacia melanoxylon | 2 | 9 |
| Tree (TG) | Corymbia intermedia | 1 | 7 |
| Tree (TG) | Elaeocarpus obovatus | 1 | 7 |
| Tree (TG) | Eucalyptus acmenoides | 3 | 7 |
| Tree (TG) | Eucalyptus amplifolia | 1 | 7 |
| Tree (TG) | Eucalyptus campanulata | 2 | 7 |
| Tree (TG) | Eucalyptus cameronii | 4 | 5 |
| Tree (TG) | Eucalyptus globoidea | 3 | 5 |
| Tree (TG) | Eucalyptus melliodora | 3 | 5 |
| Tree (TG) | Eucalyptus microcorys | 3 | 5 |
| Tree (TG) | Eucalyptus moluccana | 3 | 5 |
| Tree (TG) | Allocasuarina littoralis | 1 | 3 |
| Tree (TG) | Corymbia maculata | 3 | 3 |
| Tree (TG) | Ehretia acuminata var. acuminata | 1 | 3 |
| Tree (TG) | Eucalyptus andrewsii | 6 | 3 |
| Tree (TG) | Eucalyptus caliginosa | 3 | 3 |
| Tree (TG) | Eucalyptus carnea | 1 | 3 |
| Tree (TG) | Eucalyptus crebra | 1 | 3 |
| Tree (TG) | Eucalyptus dives | 3 | 3 |
| Tree (TG) | Eucalyptus fibrosa | 1 | 3 |
| Tree (TG) | Eucalyptus quadrangulata | 3 | 3 |
| Tree (TG) | Eucalyptus radiata | 3 | 3 |
| Tree (TG) | Eucalyptus saligna | 1 | 3 |
| Tree (TG) | Euroschinus falcatus var. falcatus | 1 | 3 |
| Tree (TG) | Geijera salicifolia | 1 | 3 |
| Tree (TG) | Guioa semiglauca | 1 | 3 |

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|---|---|---|---|
| Tree (TG) | Lophostemon confertus | 1 | 3 |
| Tree (TG) | Melia azedarach | 1 | 3 |
| Tree (TG) | Olea paniculata | 1 | 3 |
| Tree (TG) | Toona ciliata | 1 | 3 |

# BioNet Vegetation Classification - Community Profile Report

***Plant Community Type ID (PCT ID):*** 3252

***PCT Name:*** Northern Hinterland Grey Gum-Mahogany Grassy Forest
***Classification Confidence Level:*** 2-High
***Total Number of Replicates:*** 115
***Number of Primary Replicates:*** 97
***Number of Secondary Replicates:*** 18
***Vegetation Description:*** Very tall to extremely tall, grassy or rarely shrub-grass sclerophyll open forest, which is widespread in the coastal hills and escarpment foothills and ranges north from Bulahdelah. The canopy very frequently includes Eucalyptus propinqua and/or commonly, Eucalyptus siderophloia and usually one of these species is present and locally dominant, having the highest foliage cover. Other canopy species commonly include Eucalyptus carnea and Eucalyptus microcorys, occasionally with Corymbia intermedia, Syncarpia glomulifera and Corymbia maculata. Allocasuarina torulosa is almost always present and commonly forms a sparse to mid-dense sub-canopy. The mid-stratum is comprised of scattered shrubs and vines and there is usually a mid-dense to dense ground stratum of grasses, graminoids and forbs. There is no shrub species which is consistently present. The most frequent shrub species are Breynia oblongifolia and Ozothamnus diosmifolius, however each occurs only occasionally. Vines which commonly occur in either the ground stratum or mid-stratum include Hardenbergia violacea, Hibbertia scandens and Kennedia rubicunda, however these very rarely have high cover. Very frequent ground cover species include Themeda triandra or Imperata cylindrica, both of which may be locally abundant, and Dianella caerulea and Lomandra longifolia, each of which rarely has high cover. The grass Entolasia stricta occurs commonly however usually with low cover. This PCT occurs mainly in warm, wet locations receiving 1170-1660 mm mean annual rainfall, at low to mid-elevations of 60-460 metres asl. It occurs on clay-rich sedimentary or meta-sedimentary substrates, on upper slope or ridge sites which are burnt at relatively high frequency. This PCT forms an intergrading mosaic with a range of other grassy forests to which it is floristically related. For example, at low elevations it may grade into PCT 3249, while at mid-elevations it may grade into PCT 3251. To distinguish PCT 3252 from these and other related grassy forests requires consideration of suites of species rather than a small number of diagnostic species. Some sites which are transitional may be difficult to assign with confidence.
***Vegetation Formation:*** Wet Sclerophyll Forests (Grassy sub-formation);
***Vegetation Class:*** Northern Hinterland Wet Sclerophyll Forests;
***IBRA Bioregion(s):*** NSW North Coast; South Eastern Queensland;
***IBRA Sub-region(s):*** Chaelundi; Coffs Coast and Escarpment; Comboyne Plateau; Dalmorton; Karuah Manning; Macleay Hastings; Mummel Escarpment; Washpool; Yuraygir; Burringbar-Conondale Ranges; Clarence Lowlands; Clarence Sandstones; Scenic Rim; Woodenbong;
***LGA:*** BELLINGEN; CLARENCE VALLEY; COFFS HARBOUR; GLEN INNES SEVERN; KEMPSEY; KYOGLE; LISMORE; MID-COAST; NAMBUCCA VALLEY; PORT MACQUARIE-HASTINGS; RICHMOND VALLEY; TWEED;
***Elevation (m) (Min, Median, Max):*** 8.9 212.9 625.3
***Annual Rainfall (mm) (Min, Median, Max):*** 1016 1433 2025
***Annual Mean Temperature (deg C) (Min, Median, Max):*** 14.49 17.24 19.17
***Median Native Species Richness per plot:*** 33
***TEC Assessed:*** No associated TEC
***TEC List:***
***TEC Comments:***
***PCT Percent Cleared:*** 23.01
***PCT Definition Status:*** Approved

## *Species By Growth Form Group*

| Growth Form Group | Species | Median cover score | Frequency |
|---|---|---|---|
| Fern (EG) | Pellaea paradoxa | 2 | 6 |
| Fern (EG) | Lindsaea microphylla | 1 | 5 |
| Fern (EG) | Pyrrosia confluens var. confluens | 1 | 5 |
| Fern (EG) | Adiantum hispidulum | 2 | 3 |
| Fern (EG) | Botrychium australe | 1 | 3 |
| Fern (EG) | Cheilanthes distans | 2 | 3 |
| Fern (EG) | Davallia solida var. pyxidata | 1 | 3 |
| Fern (EG) | Lindsaea linearis | 1 | 3 |
| Fern (EG) | Platycerium superbum | 1 | 3 |
| Fern (EG) | Pyrrosia rupestris | 1 | 3 |
| Fern (EG) | Schizaea bifida | 1 | 3 |
| Fern (EG) | Doodia australis | 2 | 2 |
| Fern (EG) | Lastreopsis decomposita | 3 | 2 |

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|---|---|---|---|
| Fern (EG) | Lastreopsis microsora subsp. microsora | 2 | 2 |
| Fern (EG) | Pteris tremula | 2 | 2 |
| Forb (FG) | Dianella caerulea | 1 | 83 |
| Forb (FG) | Desmodium rhytidophyllum | 2 | 51 |
| Forb (FG) | Lobelia purpurascens | 2 | 46 |
| Forb (FG) | Vernonia cinerea | 1 | 35 |
| Forb (FG) | Pseuderanthemum variabile | 2 | 31 |
| Forb (FG) | Plectranthus parviflorus | 1 | 22 |
| Forb (FG) | Goodenia hederacea | 2 | 18 |
| Forb (FG) | Oxytes brachypoda | 1 | 17 |
| Forb (FG) | Sigesbeckia orientalis subsp. orientalis | 1 | 15 |
| Forb (FG) | Desmodium gunnii | 1 | 14 |
| Forb (FG) | Hybanthus stellarioides | 1 | 12 |
| Forb (FG) | Dichondra repens | 2 | 11 |
| Forb (FG) | Pomax umbellata | 1 | 11 |
| Forb (FG) | Alpinia caerulea | 1 | 8 |
| Forb (FG) | Gymnostachys anceps | 1 | 8 |
| Forb (FG) | Brunoniella australis | 2 | 7 |
| Forb (FG) | Opercularia diphylla | 1 | 7 |
| Forb (FG) | Viola betonicifolia | 2 | 7 |
| Forb (FG) | Viola hederacea | 2 | 6 |
| Forb (FG) | Centratherum riparium | 1 | 5 |
| Forb (FG) | Dianella longifolia | 1 | 5 |
| Forb (FG) | Goodenia rotundifolia | 1 | 5 |
| Forb (FG) | Tripladenia cunninghamii | 2 | 5 |
| Forb (FG) | Caladenia carnea | 1 | 4 |
| Forb (FG) | Chiloglottis diphylla | 1 | 4 |
| Forb (FG) | Dianella revoluta | 2 | 4 |
| Forb (FG) | Geranium solanderi | 1 | 4 |
| Forb (FG) | Gonocarpus humilis | 1 | 4 |
| Forb (FG) | Gonocarpus teucrioides | 1 | 4 |
| Forb (FG) | Hydrocotyle acutiloba | 2 | 4 |
| Forb (FG) | Hypericum gramineum | 1 | 4 |
| Forb (FG) | Lagenophora gracilis | 1 | 4 |
| Forb (FG) | Oxalis chnoodes | 1 | 4 |
| Forb (FG) | Oxalis perennans | 1 | 4 |
| Forb (FG) | Poranthera microphylla | 1 | 4 |
| Forb (FG) | Aneilema acuminatum | 2 | 3 |
| Forb (FG) | Centella asiatica | 1 | 3 |
| Forb (FG) | Chamaecrista nomame var. nomame | 1 | 3 |
| Forb (FG) | Commelina cyanea | 1 | 3 |
| Forb (FG) | Desmodium nemorosum | 2 | 3 |
| Forb (FG) | Eclipta platyglossa | 1 | 3 |

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|---|---|---|---|
| Forb (FG) | Gonocarpus chinensis subsp. verrucosus | 1 | 3 |
| Forb (FG) | Goodenia heterophylla | 2 | 3 |
| Forb (FG) | Hydrocotyle laxiflora | 2 | 3 |
| Forb (FG) | Hypericum japonicum | 2 | 3 |
| Forb (FG) | Lagenophora stipitata | 2 | 3 |
| Forb (FG) | Lobelia pedunculata | 2 | 3 |
| Forb (FG) | Opercularia aspera | 2 | 3 |
| Forb (FG) | Phyllanthus similis | 1 | 3 |
| Forb (FG) | Senecio amygdalifolius | 2 | 3 |
| Forb (FG) | Swainsona galegifolia | 1 | 3 |
| Forb (FG) | Tricoryne elatior | 2 | 3 |
| Forb (FG) | Veronica plebeia | 2 | 3 |
| Forb (FG) | Acianthus fornicatus | 1 | 2 |
| Forb (FG) | Acianthus pusillus | 2 | 2 |
| Forb (FG) | Ajuga australis | 1 | 2 |
| Forb (FG) | Arthropodium minus | 1 | 2 |
| Forb (FG) | Arthropodium strictum | 2 | 2 |
| Forb (FG) | Brachyscome microcarpa | 1 | 2 |
| Forb (FG) | Caesia parviflora | 2 | 2 |
| Forb (FG) | Caladenia catenata | 1 | 2 |
| Forb (FG) | Dampiera stricta | 2 | 2 |
| Forb (FG) | Diuris sulphurea | 1 | 2 |
| Forb (FG) | Euchiton japonicus | 1 | 2 |
| Forb (FG) | Euchiton sphaericus | 1 | 2 |
| Forb (FG) | Geranium homeanum | 1 | 2 |
| Forb (FG) | Gonocarpus micranthus | 2 | 2 |
| Forb (FG) | Gonocarpus tetragynus | 2 | 2 |
| Forb (FG) | Goodenia fordiana | 1 | 2 |
| Forb (FG) | Hovea linearis | 2 | 2 |
| Forb (FG) | Hydrocotyle pedicellosa | 2 | 2 |
| Forb (FG) | Hydrocotyle sibthorpioides | 1 | 2 |
| Forb (FG) | Lobelia gibbosa | 1 | 2 |
| Forb (FG) | Oxalis exilis | 1 | 2 |
| Forb (FG) | Oxalis radicosa | 2 | 2 |
| Forb (FG) | Patersonia glabrata | 1 | 2 |
| Forb (FG) | Physalis minima | 1 | 2 |
| Forb (FG) | Plantago debilis | 1 | 2 |
| Forb (FG) | Plectranthus graveolens | 2 | 2 |
| Forb (FG) | Plectranthus suaveolens | 1 | 2 |
| Forb (FG) | Ranunculus sessiliflorus | 1 | 2 |
| Forb (FG) | Rostellularia adscendens | 1 | 2 |
| Forb (FG) | Schelhammera undulata | 1 | 2 |
| Forb (FG) | Solanum prinophyllum | 2 | 2 |

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|---|---|---|---|
| Forb (FG) | Solanum pungetium | 1 | 2 |
| Forb (FG) | Stackhousia viminea | 1 | 2 |
| Forb (FG) | Stylidium graminifolium | 1 | 2 |
| Forb (FG) | Trachymene incisa subsp. incisa | 2 | 2 |
| Forb (FG) | Urtica incisa | 1 | 2 |
| Forb (FG) | Viola banksii | 1 | 2 |
| Forb (FG) | Xerochrysum bracteatum | 1 | 2 |
| Grass & grasslike (GG) | Themeda triandra | 3 | 89 |
| Grass & grasslike (GG) | Imperata cylindrica | 2 | 86 |
| Grass & grasslike (GG) | Lomandra longifolia | 2 | 80 |
| Grass & grasslike (GG) | Entolasia stricta | 2 | 54 |
| Grass & grasslike (GG) | Cymbopogon refractus | 2 | 36 |
| Grass & grasslike (GG) | Lomandra filiformis | 1 | 32 |
| Grass & grasslike (GG) | Poa sieberiana | 2 | 28 |
| Grass & grasslike (GG) | Lepidosperma laterale | 1 | 27 |
| Grass & grasslike (GG) | Lomandra multiflora subsp. multiflora | 1 | 27 |
| Grass & grasslike (GG) | Oplismenus imbecillis | 2 | 25 |
| Grass & grasslike (GG) | Digitaria parviflora | 2 | 18 |
| Grass & grasslike (GG) | Panicum simile | 2 | 18 |
| Grass & grasslike (GG) | Oplismenus aemulus | 2 | 17 |
| Grass & grasslike (GG) | Lomandra confertifolia | 2 | 15 |
| Grass & grasslike (GG) | Entolasia marginata | 2 | 11 |
| Grass & grasslike (GG) | Echinopogon caespitosus | 2 | 9 |
| Grass & grasslike (GG) | Microlaena stipoides | 1 | 7 |
| Grass & grasslike (GG) | Dichelachne micrantha | 1 | 6 |
| Grass & grasslike (GG) | Ottochloa gracillima | 2 | 6 |
| Grass & grasslike (GG) | Panicum obseptum | 2 | 6 |
| Grass & grasslike (GG) | Aristida vagans | 1 | 5 |
| Grass & grasslike (GG) | Gahnia aspera | 2 | 5 |
| Grass & grasslike (GG) | Paspalidium distans | 1 | 5 |
| Grass & grasslike (GG) | Poa labillardierei var. labillardierei | 2 | 5 |
| Grass & grasslike (GG) | Panicum effusum | 2 | 4 |
| Grass & grasslike (GG) | Capillipedium parviflorum | 2 | 3 |
| Grass & grasslike (GG) | Cenchrus caliculatus | 1 | 3 |
| Grass & grasslike (GG) | Eragrostis brownii | 2 | 3 |
| Grass & grasslike (GG) | Eragrostis leptostachya | 1 | 3 |
| Grass & grasslike (GG) | Panicum pygmaeum | 2 | 3 |
| Grass & grasslike (GG) | Sorghum leiocladum | 3 | 3 |
| Grass & grasslike (GG) | Aristida warburgii | 1 | 2 |
| Grass & grasslike (GG) | Capillipedium spicigerum | 2 | 2 |
| Grass & grasslike (GG) | Cyperus gracilis | 2 | 2 |
| Grass & grasslike (GG) | Cyperus imbecillis | 2 | 2 |
| Grass & grasslike (GG) | Cyperus polystachyos | 3 | 2 |

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|---|---|---|---|
| Grass & grasslike (GG) | Digitaria breviglumis | 1 | 2 |
| Grass & grasslike (GG) | Digitaria divaricatissima | 1 | 2 |
| Grass & grasslike (GG) | Digitaria ramularis | 1 | 2 |
| Grass & grasslike (GG) | Eragrostis benthamii | 2 | 2 |
| Grass & grasslike (GG) | Fimbristylis dichotoma | 1 | 2 |
| Grass & grasslike (GG) | Gahnia sieberiana | 1 | 2 |
| Grass & grasslike (GG) | Ischaemum australe | 2 | 2 |
| Grass & grasslike (GG) | Juncus continuus | 2 | 2 |
| Grass & grasslike (GG) | Lomandra spicata | 1 | 2 |
| Grass & grasslike (GG) | Oplismenus undulatifolius | 2 | 2 |
| Grass & grasslike (GG) | Paspalum orbiculare | 2 | 2 |
| Grass & grasslike (GG) | Poa queenslandica | 3 | 2 |
| Grass & grasslike (GG) | Scleria mackaviensis | 2 | 2 |
| Grass & grasslike (GG) | Scleria rugosa | 2 | 2 |
| Other (OG) | Hardenbergia violacea | 1 | 64 |
| Other (OG) | Hibbertia scandens | 1 | 52 |
| Other (OG) | Kennedia rubicunda | 2 | 52 |
| Other (OG) | Glycine clandestina | 1 | 49 |
| Other (OG) | Eustrephus latifolius | 1 | 39 |
| Other (OG) | Geitonoplesium cymosum | 1 | 35 |
| Other (OG) | Pandorea pandorana subsp. pandorana | 1 | 35 |
| Other (OG) | Smilax australis | 1 | 29 |
| Other (OG) | Desmodium varians | 1 | 27 |
| Other (OG) | Billardiera scandens | 1 | 24 |
| Other (OG) | Cissus hypoglauca | 1 | 23 |
| Other (OG) | Cissus antarctica | 1 | 21 |
| Other (OG) | Stephania japonica var. discolor | 1 | 15 |
| Other (OG) | Cayratia clematidea | 1 | 12 |
| Other (OG) | Clematis aristata | 1 | 12 |
| Other (OG) | Cymbidium suave | 1 | 12 |
| Other (OG) | Clematis glycinoides | 1 | 9 |
| Other (OG) | Glycine microphylla | 1 | 9 |
| Other (OG) | Gynochthodes jasminoides | 1 | 9 |
| Other (OG) | Xanthorrhoea johnsonii | 2 | 9 |
| Other (OG) | Celastrus subspicata | 1 | 8 |
| Other (OG) | Glycine tabacina | 2 | 7 |
| Other (OG) | Hibbertia dentata | 1 | 6 |
| Other (OG) | Maclura cochinchinensis | 1 | 6 |
| Other (OG) | Parsonsia straminea | 1 | 5 |
| Other (OG) | Xanthorrhoea macronema | 1 | 5 |
| Other (OG) | Calochlaena dubia | 2 | 4 |
| Other (OG) | Cordyline stricta | 1 | 4 |
| Other (OG) | Derris involuta | 2 | 4 |

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|---|---|---|---|
| Other (OG) | Smilax glyciphylla | 1 | 4 |
| Other (OG) | Archontophoenix cunninghamiana | 2 | 3 |
| Other (OG) | Clematicissus opaca | 2 | 3 |
| Other (OG) | Cyathea australis | 2 | 3 |
| Other (OG) | Dendrobium aemulum | 2 | 3 |
| Other (OG) | Erythrorchis cassythoides | 1 | 3 |
| Other (OG) | Marsdenia lloydii | 1 | 3 |
| Other (OG) | Sarcopetalum harveyanum | 1 | 3 |
| Other (OG) | Tetrastigma nitens | 1 | 3 |
| Other (OG) | Tylophora paniculata | 2 | 3 |
| Other (OG) | Xanthorrhoea malacophylla | 1 | 3 |
| Other (OG) | Benthamina alyxifolia | 1 | 2 |
| Other (OG) | Cassytha glabella | 1 | 2 |
| Other (OG) | Dendrobium gracilicaule | 1 | 2 |
| Other (OG) | Dendrobium schneiderae | 1 | 2 |
| Other (OG) | Dioscorea transversa | 1 | 2 |
| Other (OG) | Glycine cyrtoloba | 1 | 2 |
| Other (OG) | Glycine tomentella | 1 | 2 |
| Other (OG) | Legnephora moorei | 1 | 2 |
| Other (OG) | Lepidozamia peroffskyana | 4 | 2 |
| Other (OG) | Marsdenia liisae | 1 | 2 |
| Other (OG) | Marsdenia rostrata | 1 | 2 |
| Other (OG) | Muellerina celastroides | 1 | 2 |
| Other (OG) | Neoachmandra cunninghamii | 1 | 2 |
| Other (OG) | Parsonsia velutina | 1 | 2 |
| Other (OG) | Polymeria calycina | 1 | 2 |
| Other (OG) | Sarcochilus falcatus | 1 | 2 |
| Shrub (SG) | Breynia oblongifolia | 1 | 50 |
| Shrub (SG) | Ozothamnus diosmifolius | 1 | 32 |
| Shrub (SG) | Polyscias sambucifolia | 1 | 24 |
| Shrub (SG) | Jacksonia scoparia | 2 | 22 |
| Shrub (SG) | Acacia irrorata | 2 | 21 |
| Shrub (SG) | Persoonia stradbrokensis | 1 | 20 |
| Shrub (SG) | Indigofera australis | 2 | 19 |
| Shrub (SG) | Acacia fimbriata | 2 | 17 |
| Shrub (SG) | Persoonia conjuncta | 2 | 17 |
| Shrub (SG) | Rubus parvifolius | 1 | 15 |
| Shrub (SG) | Solanum hapalum | 2 | 15 |
| Shrub (SG) | Leucopogon juniperinus | 1 | 13 |
| Shrub (SG) | Psychotria loniceroides | 1 | 12 |
| Shrub (SG) | Archirhodomyrtus beckleri | 1 | 11 |
| Shrub (SG) | Daviesia ulicifolia | 1 | 11 |
| Shrub (SG) | Leucopogon lanceolatus | 1 | 11 |

| | | | |
|---|---|---|---|
| Shrub (SG) | Myrsine variabilis | 1 | 11 |
| Shrub (SG) | Persoonia media | 1 | 11 |
| Shrub (SG) | Podolobium ilicifolium | 2 | 11 |
| Shrub (SG) | Denhamia silvestris | 1 | 10 |
| Shrub (SG) | Solanum stelligerum | 1 | 10 |
| Shrub (SG) | Persoonia linearis | 2 | 9 |
| Shrub (SG) | Acacia longifolia | 1 | 8 |
| Shrub (SG) | Dodonaea triquetra | 1 | 8 |
| Shrub (SG) | Exocarpos strictus | 1 | 8 |
| Shrub (SG) | Hibbertia obtusifolia | 1 | 8 |
| Shrub (SG) | Persoonia levis | 1 | 8 |
| Shrub (SG) | Acacia falcata | 1 | 7 |
| Shrub (SG) | Acacia floribunda | 2 | 7 |
| Shrub (SG) | Astrotricha latifolia | 2 | 7 |
| Shrub (SG) | Hibbertia aspera | 2 | 7 |
| Shrub (SG) | Pittosporum revolutum | 1 | 7 |
| Shrub (SG) | Pultenaea retusa | 2 | 7 |
| Shrub (SG) | Trema tomentosa var. aspera | 2 | 7 |
| Shrub (SG) | Cryptocarya rigida | 1 | 6 |
| Shrub (SG) | Myrsine howittiana | 1 | 6 |
| Shrub (SG) | Pittosporum undulatum | 1 | 6 |
| Shrub (SG) | Acacia falciformis | 2 | 5 |
| Shrub (SG) | Acacia ulicifolia | 1 | 5 |
| Shrub (SG) | Callistemon salignus | 1 | 5 |
| Shrub (SG) | Daviesia arborea | 1 | 5 |
| Shrub (SG) | Elaeocarpus reticulatus | 1 | 5 |
| Shrub (SG) | Gompholobium latifolium | 1 | 5 |
| Shrub (SG) | Phyllanthus gunnii | 1 | 5 |
| Shrub (SG) | Rubus moluccanus | 1 | 5 |
| Shrub (SG) | Rubus rosifolius | 1 | 5 |
| Shrub (SG) | Diospyros australis | 1 | 4 |
| Shrub (SG) | Exocarpos cupressiformis | 1 | 4 |
| Shrub (SG) | Lomatia silaifolia | 1 | 4 |
| Shrub (SG) | Notelaea ovata | 1 | 4 |
| Shrub (SG) | Pimelea linifolia | 1 | 4 |
| Shrub (SG) | Pultenaea villosa | 1 | 4 |
| Shrub (SG) | Rhodamnia rubescens | 1 | 4 |
| Shrub (SG) | Synoum glandulosum subsp. glandulosum | 1 | 4 |
| Shrub (SG) | Acacia leiocalyx subsp. leiocalyx | 1 | 3 |
| Shrub (SG) | Acacia longissima | 1 | 3 |
| Shrub (SG) | Bursaria spinosa | 1 | 3 |
| Shrub (SG) | Daviesia genistifolia | 1 | 3 |
| Shrub (SG) | Duboisia myoporoides | 1 | 3 |

| | | | |
|---|---|---|---|
| Shrub (SG) | Ficus coronata | 1 | 3 |
| Shrub (SG) | Hibbertia diffusa | 1 | 3 |
| Shrub (SG) | Hibbertia vestita | 1 | 3 |
| Shrub (SG) | Hovea acutifolia | 1 | 3 |
| Shrub (SG) | Monotoca scoparia | 2 | 3 |
| Shrub (SG) | Olearia nernstii | 1 | 3 |
| Shrub (SG) | Persoonia sericea | 2 | 3 |
| Shrub (SG) | Phyllanthus hirtellus | 1 | 3 |
| Shrub (SG) | Pimelea ligustrina | 1 | 3 |
| Shrub (SG) | Pittosporum multiflorum | 1 | 3 |
| Shrub (SG) | Psychotria daphnoides | 2 | 3 |
| Shrub (SG) | Pultenaea spinosa | 5 | 3 |
| Shrub (SG) | Rhodomyrtus psidioides | 2 | 3 |
| Shrub (SG) | Abutilon oxycarpum | 1 | 2 |
| Shrub (SG) | Acacia brownii | 1 | 2 |
| Shrub (SG) | Acalypha nemorum | 1 | 2 |
| Shrub (SG) | Acronychia oblongifolia | 3 | 2 |
| Shrub (SG) | Bossiaea obcordata | 2 | 2 |
| Shrub (SG) | Calytrix tetragona | 1 | 2 |
| Shrub (SG) | Chorizema parviflorum | 1 | 2 |
| Shrub (SG) | Claoxylon australe | 1 | 2 |
| Shrub (SG) | Clerodendrum floribundum var. floribundum | 1 | 2 |
| Shrub (SG) | Coronidium elatum | 1 | 2 |
| Shrub (SG) | Daviesia acicularis | 1 | 2 |
| Shrub (SG) | Dillwynia phylicoides | 1 | 2 |
| Shrub (SG) | Dodonaea viscosa | 1 | 2 |
| Shrub (SG) | Eremophila debilis | 1 | 2 |
| Shrub (SG) | Eupomatia laurina | 2 | 2 |
| Shrub (SG) | Goodenia ovata | 1 | 2 |
| Shrub (SG) | Hakea eriantha | 2 | 2 |
| Shrub (SG) | Hakea florulenta | 1 | 2 |
| Shrub (SG) | Hibbertia empetrifolia subsp. empetrifolia | 1 | 2 |
| Shrub (SG) | Hibbertia linearis | 1 | 2 |
| Shrub (SG) | Leptospermum juniperinum | 1 | 2 |
| Shrub (SG) | Leptospermum polygalifolium | 1 | 2 |
| Shrub (SG) | Notelaea sp. A | 1 | 2 |
| Shrub (SG) | Olearia oppositifolia | 1 | 2 |
| Shrub (SG) | Olearia viscidula | 2 | 2 |
| Shrub (SG) | Ozothamnus obovatus | 1 | 2 |
| Shrub (SG) | Persoonia cornifolia | 1 | 2 |
| Shrub (SG) | Pimelea latifolia | 1 | 2 |
| Shrub (SG) | Pimelea latifolia subsp. hirsuta | 2 | 2 |
| Shrub (SG) | Prostanthera incisa | 1 | 2 |

| | | | |
|---|---|---|---|
| Shrub (SG) | Pultenaea linophylla | 2 | 2 |
| Shrub (SG) | Solanum amblymerum | 1 | 2 |
| Shrub (SG) | Solanum aviculare | 1 | 2 |
| Shrub (SG) | Solanum brownii | 1 | 2 |
| Shrub (SG) | Solanum inaequilaterum | 1 | 2 |
| Shrub (SG) | Solanum nemophilum | 1 | 2 |
| Shrub (SG) | Syzygium oleosum | 1 | 2 |
| Shrub (SG) | Tabernaemontana pandacaqui | 1 | 2 |
| Shrub (SG) | Wilkiea huegeliana | 1 | 2 |
| Shrub (SG) | Zieria smithii | 2 | 2 |
| Tree (TG) | Allocasuarina torulosa | 3 | 95 |
| Tree (TG) | Eucalyptus propinqua | 3 | 79 |
| Tree (TG) | Eucalyptus siderophloia | 3 | 70 |
| Tree (TG) | Eucalyptus carnea | 3 | 63 |
| Tree (TG) | Eucalyptus microcorys | 2 | 63 |
| Tree (TG) | Corymbia intermedia | 3 | 48 |
| Tree (TG) | Syncarpia glomulifera | 2 | 48 |
| Tree (TG) | Corymbia maculata | 3 | 33 |
| Tree (TG) | Lophostemon confertus | 1 | 29 |
| Tree (TG) | Trochocarpa laurina | 1 | 28 |
| Tree (TG) | Notelaea longifolia | 1 | 27 |
| Tree (TG) | Acacia maidenii | 1 | 26 |
| Tree (TG) | Eucalyptus acmenoides | 2 | 23 |
| Tree (TG) | Glochidion ferdinandi | 1 | 23 |
| Tree (TG) | Eucalyptus tereticornis | 2 | 19 |
| Tree (TG) | Acacia melanoxylon | 1 | 18 |
| Tree (TG) | Eucalyptus pilularis | 3 | 18 |
| Tree (TG) | Alphitonia excelsa | 1 | 17 |
| Tree (TG) | Corymbia gummifera | 2 | 16 |
| Tree (TG) | Denhamia bilocularis | 1 | 14 |
| Tree (TG) | Guioa semiglauca | 1 | 13 |
| Tree (TG) | Eucalyptus resinifera | 3 | 11 |
| Tree (TG) | Angophora costata | 2 | 10 |
| Tree (TG) | Eucalyptus crebra | 3 | 10 |
| Tree (TG) | Polyscias elegans | 1 | 10 |
| Tree (TG) | Acacia binervata | 2 | 9 |
| Tree (TG) | Eucalyptus umbra | 2 | 8 |
| Tree (TG) | Angophora floribunda | 2 | 7 |
| Tree (TG) | Eucalyptus globoidea | 1 | 7 |
| Tree (TG) | Eucalyptus rummeryi | 3 | 7 |
| Tree (TG) | Euroschinus falcatus var. falcatus | 1 | 7 |
| Tree (TG) | Clerodendrum tomentosum | 1 | 5 |
| Tree (TG) | Mallotus philippensis | 1 | 5 |

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|---|---|---|---|
| Tree (TG) | Allocasuarina littoralis | 2 | 4 |
| Tree (TG) | Angophora subvelutina | 1 | 4 |
| Tree (TG) | Drypetes deplanchei | 1 | 4 |
| Tree (TG) | Acacia concurrens | 2 | 3 |
| Tree (TG) | Acacia oshanesii | 2 | 3 |
| Tree (TG) | Cyclophyllum longipetalum | 1 | 3 |
| Tree (TG) | Eucalyptus eugenioides | 2 | 3 |
| Tree (TG) | Eucalyptus pyrocarpa | 4 | 3 |
| Tree (TG) | Eucalyptus saligna | 2 | 3 |
| Tree (TG) | Flindersia schottiana | 1 | 3 |
| Tree (TG) | Lophostemon suaveolens | 2 | 3 |
| Tree (TG) | Petalostigma triloculare | 1 | 3 |
| Tree (TG) | Angophora leiocarpa | 1 | 2 |
| Tree (TG) | Angophora paludosa | 2 | 2 |
| Tree (TG) | Angophora robur | 1 | 2 |
| Tree (TG) | Banksia integrifolia | 2 | 2 |
| Tree (TG) | Ceratopetalum apetalum | 1 | 2 |
| Tree (TG) | Corymbia henryi | 3 | 2 |
| Tree (TG) | Cryptocarya microneura | 2 | 2 |
| Tree (TG) | Diploglottis australis | 1 | 2 |
| Tree (TG) | Elaeocarpus obovatus | 1 | 2 |
| Tree (TG) | Endiandra muelleri | 2 | 2 |
| Tree (TG) | Eucalyptus campanulata | 2 | 2 |
| Tree (TG) | Eucalyptus fibrosa | 1 | 2 |
| Tree (TG) | Eucalyptus fusiformis | 3 | 2 |
| Tree (TG) | Eucalyptus moluccana | 3 | 2 |
| Tree (TG) | Eucalyptus punctata | 3 | 2 |
| Tree (TG) | Gmelina leichhardtii | 1 | 2 |
| Tree (TG) | Gossia bidwillii | 1 | 2 |
| Tree (TG) | Melia azedarach | 1 | 2 |
| Tree (TG) | Neolitsea dealbata | 1 | 2 |
| Tree (TG) | Olea paniculata | 1 | 2 |
| Tree (TG) | Schizomeria ovata | 1 | 2 |
| Tree (TG) | Syzygium luehmannii | 1 | 2 |
| Tree (TG) | Toona ciliata | 1 | 2 |
| Fern (EG) | Pteridium esculentum | 2 | 35 |
| Fern (EG) | Doodia aspera | 2 | 11 |
| Fern (EG) | Cheilanthes sieberi subsp. sieberi | 1 | 10 |
| Fern (EG) | Adiantum aethiopicum | 1 | 9 |
| Fern (EG) | Blechnum cartilagineum | 2 | 8 |
| Fern (EG) | Cheilanthes austrotenuifolia | 1 | 8 |
| Fern (EG) | Platycerium bifurcatum | 1 | 8 |

# *BioNet Vegetation Classification - Community Profile Report*

***Plant Community Type ID (PCT ID):*** 3329

***PCT Name:*** Northern Hinterland Valleys Red Gum Grassy Forest
***Classification Confidence Level:*** 2-High
***Total Number of Replicates:*** 86
***Number of Primary Replicates:*** 74
***Number of Secondary Replicates:*** 12
***Vegetation Description:*** A tall to extremely tall sclerophyll open forest with a sparse mid-stratum of soft-leaved shrubs and small trees and a distinct, grassy ground layer that occurs on undulating hills in the hinterland valleys of the Manning, Hastings, Macleay and Clarence River valleys. The canopy almost always includes red gums (Eucalyptus tereticornis or Eucalyptus amplifolia). Other canopy species that are occasionally present in localised areas include Eucalyptus eugenioides, Eucalyptus moluccana and apples (Angophora subvelutina or Angophora floribunda). The mid-stratum very frequently includes scattered acacias of which Acacia implexa and Acacia melanoxylon are most frequent, occasionally accompanied by Breynia oblongifolia or Notelaea longifolia. Taller examples of Acacia melanoxylon may extend into the canopy in some locations. The dense ground layer is mainly comprised of grasses, soft-leaved forbs, twiners and hardy ferns, and almost always includes Dichondra repens, Lobelia purpurascens and Glycine tabacina. Cymbopogon refractus, Microlaena stipoides, Imperata cylindrica, Desmodium varians and Brunoniella australis are very frequent, commonly with Themeda triandra, Cheilanthes sieberi subsp. sieberi and Geitonoplesium cymosum. This PCT primarily occurs on fine-grained sediments, however is also known from acid volcanics or granite. The hinterland valleys where it occurs have been extensively cleared and it often occurs in small patches, around the margin of the valley floor or on lower slopes of the adjoining hills. It typically occurs at elevations of below 350 metres asl in hot, moist environments. This community is related floristically to PCT 3446, which also includes red gums in its canopy, however differs in that it occurs on shallower, sandier soils in the Hunter valley and lower north coast, and very frequently has ironbarks and commonly Corymbia maculata in its canopy. In the upper Clarence River, this PCT is found to the west of PCT 3322, another red gum grassy forest than occurs in a wetter climate in the Richmond and Tweed valleys, which differs however in very frequently having Corymbia intermedia and Eucalyptus microcorys in the canopy and commonly including vines such as Smilax australis.
***Vegetation Formation:*** Grassy Woodlands;
***Vegetation Class:*** Coastal Valley Grassy Woodlands;
***IBRA Bioregion(s):*** New England Tablelands; NSW North Coast; South Eastern Queensland;
***IBRA Sub-region(s):*** Walcha Plateau; Dalmorton; Guy Fawkes; Karuah Manning; Macleay Gorges; Macleay Hastings; Mummel Escarpment; Clarence Sandstones; Woodenbong;
***LGA:*** ARMIDALE REGIONAL; CLARENCE VALLEY; GLEN INNES SEVERN; KEMPSEY; KYOGLE; MID-COAST; PORT MACQUARIE-HASTINGS; TENTERFIELD; WALCHA;
***Elevation (m) (Min, Median, Max):*** 27.1 144.6 467.7
***Annual Rainfall (mm) (Min, Median, Max):*** 871 1102 1376
***Annual Mean Temperature (deg C) (Min, Median, Max):*** 15.12 17.17 18.04
***Median Native Species Richness per plot:*** 41
***TEC Assessed:*** No associated TEC
***TEC List:***
***TEC Comments:***
***PCT Percent Cleared:*** 79.18
***PCT Definition Status:*** Approved

## *Species By Growth Form Group*

| Growth Form Group | Species | Median cover score | Frequency |
|---|---|---|---|
| Fern (EG) | Cheilanthes sieberi subsp. sieberi | 2 | 57 |
| Fern (EG) | Pteridium esculentum | 2 | 18 |
| Fern (EG) | Pellaea falcata | 2 | 9 |
| Fern (EG) | Adiantum aethiopicum | 2 | 6 |
| Fern (EG) | Cheilanthes distans | 2 | 6 |
| Fern (EG) | Pellaea paradoxa | 1 | 5 |
| Fern (EG) | Botrychium australe | 1 | 2 |
| Fern (EG) | Doodia aspera | 1 | 2 |
| Fern (EG) | Platycerium bifurcatum | 1 | 2 |
| Fern (EG) | Pyrrosia rupestris | 1 | 2 |
| Forb (FG) | Dichondra repens | 2 | 94 |
| Forb (FG) | Lobelia purpurascens | 2 | 94 |
| Forb (FG) | Brunoniella australis | 2 | 73 |

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|---|---|---|---|
| Forb (FG) | Vernonia cinerea | 1 | 49 |
| Forb (FG) | Desmodium gunnii | 2 | 48 |
| Forb (FG) | Hybanthus stellarioides | 2 | 42 |
| Forb (FG) | Desmodium rhytidophyllum | 2 | 40 |
| Forb (FG) | Dianella longifolia | 1 | 37 |
| Forb (FG) | Centella asiatica | 2 | 33 |
| Forb (FG) | Geranium solanderi | 2 | 33 |
| Forb (FG) | Phyllanthus virgatus | 1 | 32 |
| Forb (FG) | Rostellularia adscendens | 2 | 32 |
| Forb (FG) | Mentha satureioides | 2 | 29 |
| Forb (FG) | Oxalis perennans | 1 | 26 |
| Forb (FG) | Veronica plebeia | 1 | 26 |
| Forb (FG) | Daucus glochidiatus | 1 | 25 |
| Forb (FG) | Sigesbeckia orientalis subsp. orientalis | 1 | 25 |
| Forb (FG) | Hypericum gramineum | 2 | 23 |
| Forb (FG) | Wahlenbergia gracilis | 1 | 23 |
| Forb (FG) | Arthropodium sp. South-east Highlands | 2 | 22 |
| Forb (FG) | Commelina cyanea | 1 | 18 |
| Forb (FG) | Hydrocotyle laxiflora | 2 | 18 |
| Forb (FG) | Opercularia diphylla | 1 | 18 |
| Forb (FG) | Plantago debilis | 2 | 18 |
| Forb (FG) | Ajuga australis | 1 | 17 |
| Forb (FG) | Dianella revoluta | 1 | 14 |
| Forb (FG) | Lespedeza juncea subsp. sericea | 1 | 14 |
| Forb (FG) | Tricoryne elatior | 2 | 14 |
| Forb (FG) | Viola betonicifolia | 2 | 14 |
| Forb (FG) | Plectranthus parviflorus | 1 | 13 |
| Forb (FG) | Euchiton sphaericus | 1 | 11 |
| Forb (FG) | Poranthera microphylla | 1 | 11 |
| Forb (FG) | Centratherum riparium | 2 | 10 |
| Forb (FG) | Dianella caerulea | 1 | 10 |
| Forb (FG) | Murdannia graminea | 2 | 10 |
| Forb (FG) | Ranunculus lappaceus | 1 | 10 |
| Forb (FG) | Stackhousia viminea | 1 | 10 |
| Forb (FG) | Geranium homeanum | 2 | 9 |
| Forb (FG) | Oxytes brachypoda | 1 | 9 |
| Forb (FG) | Polygala japonica | 1 | 9 |
| Forb (FG) | Rumex brownii | 1 | 9 |
| Forb (FG) | Zornia dyctiocarpa var. dyctiocarpa | 1 | 9 |
| Forb (FG) | Euchiton involucratus | 1 | 7 |
| Forb (FG) | Euchiton japonicus | 1 | 7 |
| Forb (FG) | Glossocardia bidens | 1 | 7 |
| Forb (FG) | Hypoxis hygrometrica | 1 | 7 |

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|---|---|---|---|
| Forb (FG) | Lagenophora stipitata | 1 | 7 |
| Forb (FG) | Laxmannia gracilis | 1 | 7 |
| Forb (FG) | Craspedia variabilis | 2 | 6 |
| Forb (FG) | Goodenia hederacea | 2 | 6 |
| Forb (FG) | Haloragis heterophylla | 2 | 6 |
| Forb (FG) | Nyssanthes diffusa | 2 | 6 |
| Forb (FG) | Sida corrugata | 2 | 6 |
| Forb (FG) | Aeschynomene brevifolia | 1 | 5 |
| Forb (FG) | Chrysocephalum apiculatum | 2 | 5 |
| Forb (FG) | Crassula sieberiana | 2 | 5 |
| Forb (FG) | Galium leiocarpum | 1 | 5 |
| Forb (FG) | Mentha diemenica | 2 | 5 |
| Forb (FG) | Oxalis exilis | 1 | 5 |
| Forb (FG) | Pseuderanthemum variabile | 1 | 5 |
| Forb (FG) | Ranunculus sessiliflorus | 1 | 5 |
| Forb (FG) | Solanum prinophyllum | 1 | 5 |
| Forb (FG) | Urtica incisa | 2 | 5 |
| Forb (FG) | Wahlenbergia stricta | 1 | 5 |
| Forb (FG) | Asperula conferta | 2 | 3 |
| Forb (FG) | Caesia parviflora | 2 | 3 |
| Forb (FG) | Dianella tasmanica | 1 | 3 |
| Forb (FG) | Dichondra sp. Inglewood | 3 | 3 |
| Forb (FG) | Einadia trigonos | 2 | 3 |
| Forb (FG) | Galium binifolium | 2 | 3 |
| Forb (FG) | Senecio quadridentatus | 1 | 3 |
| Forb (FG) | Sida hackettiana | 1 | 3 |
| Forb (FG) | Centipeda minima subsp. minima | 1 | 2 |
| Forb (FG) | Chamaecrista nomame var. nomame | 1 | 2 |
| Forb (FG) | Chrysocephalum semipapposum | 2 | 2 |
| Forb (FG) | Crotalaria montana var. angustifolia | 1 | 2 |
| Forb (FG) | Curculigo ensifolia var. ensifolia | 1 | 2 |
| Forb (FG) | Cymbonotus lawsonianus | 2 | 2 |
| Forb (FG) | Euphorbia drummondii | 2 | 2 |
| Forb (FG) | Galium leptogonium | 1 | 2 |
| Forb (FG) | Gonocarpus teucrioides | 1 | 2 |
| Forb (FG) | Goodenia heterophylla | 2 | 2 |
| Forb (FG) | Hovea linearis | 1 | 2 |
| Forb (FG) | Hydrocotyle acutiloba | 3 | 2 |
| Forb (FG) | Hydrocotyle geraniifolia | 1 | 2 |
| Forb (FG) | Hydrocotyle sibthorpioides | 2 | 2 |
| Forb (FG) | Hydrocotyle tripartita | 2 | 2 |
| Forb (FG) | Lagenophora gracilis | 1 | 2 |
| Forb (FG) | Malvastrum coromandelianum | 1 | 2 |

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|---|---|---|---|
| Forb (FG) | Opercularia aspera | 2 | 2 |
| Forb (FG) | Opercularia hispida | 2 | 2 |
| Forb (FG) | Oxalis chnoodes | 1 | 2 |
| Forb (FG) | Picris angustifolia | 1 | 2 |
| Forb (FG) | Plectranthus graveolens | 1 | 2 |
| Forb (FG) | Pomax umbellata | 1 | 2 |
| Forb (FG) | Pterostylis pedunculata | 2 | 2 |
| Forb (FG) | Sauropus hirtellus | 2 | 2 |
| Forb (FG) | Senecio prenanthoides | 1 | 2 |
| Forb (FG) | Sigesbeckia australiensis | 1 | 2 |
| Forb (FG) | Solanum pungetium | 1 | 2 |
| Forb (FG) | Spiranthes australis | 1 | 2 |
| Forb (FG) | Swainsona brachycarpa | 1 | 2 |
| Forb (FG) | Swainsona galegifolia | 1 | 2 |
| Forb (FG) | Tripladenia cunninghamii | 1 | 2 |
| Forb (FG) | Viola banksii | 1 | 2 |
| Forb (FG) | Wurmbea biglandulosa | 1 | 2 |
| Grass & grasslike (GG) | Cymbopogon refractus | 2 | 90 |
| Grass & grasslike (GG) | Microlaena stipoides | 2 | 86 |
| Grass & grasslike (GG) | Imperata cylindrica | 3 | 80 |
| Grass & grasslike (GG) | Themeda triandra | 3 | 68 |
| Grass & grasslike (GG) | Panicum effusum | 2 | 67 |
| Grass & grasslike (GG) | Eragrostis leptostachya | 2 | 60 |
| Grass & grasslike (GG) | Oplismenus aemulus | 2 | 57 |
| Grass & grasslike (GG) | Eragrostis brownii | 2 | 56 |
| Grass & grasslike (GG) | Lomandra filiformis | 2 | 55 |
| Grass & grasslike (GG) | Aristida ramosa | 2 | 52 |
| Grass & grasslike (GG) | Bothriochloa decipiens var. decipiens | 2 | 50 |
| Grass & grasslike (GG) | Cyperus gracilis | 2 | 48 |
| Grass & grasslike (GG) | Sporobolus creber | 2 | 48 |
| Grass & grasslike (GG) | Carex inversa | 2 | 45 |
| Grass & grasslike (GG) | Paspalidium distans | 2 | 42 |
| Grass & grasslike (GG) | Aristida vagans | 2 | 36 |
| Grass & grasslike (GG) | Scleria mackaviensis | 2 | 33 |
| Grass & grasslike (GG) | Dichelachne micrantha | 2 | 30 |
| Grass & grasslike (GG) | Echinopogon ovatus | 1 | 30 |
| Grass & grasslike (GG) | Digitaria parviflora | 2 | 29 |
| Grass & grasslike (GG) | Fimbristylis dichotoma | 1 | 29 |
| Grass & grasslike (GG) | Lomandra longifolia | 1 | 28 |
| Grass & grasslike (GG) | Poa labillardierei var. labillardierei | 2 | 28 |
| Grass & grasslike (GG) | Digitaria diffusa | 2 | 25 |
| Grass & grasslike (GG) | Echinopogon caespitosus | 1 | 23 |
| Grass & grasslike (GG) | Lomandra confertifolia | 2 | 23 |

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|---|---|---|---|
| Grass & grasslike (GG) | Lomandra multiflora subsp. multiflora | 1 | 22 |
| Grass & grasslike (GG) | Carex longebrachiata | 1 | 18 |
| Grass & grasslike (GG) | Oplismenus imbecillis | 1 | 15 |
| Grass & grasslike (GG) | Rytidosperma racemosum | 1 | 15 |
| Grass & grasslike (GG) | Sorghum leiocladum | 2 | 15 |
| Grass & grasslike (GG) | Capillipedium parviflorum | 2 | 13 |
| Grass & grasslike (GG) | Carex breviculmis | 2 | 13 |
| Grass & grasslike (GG) | Digitaria ramularis | 2 | 13 |
| Grass & grasslike (GG) | Panicum simile | 2 | 13 |
| Grass & grasslike (GG) | Dichanthium sericeum | 2 | 11 |
| Grass & grasslike (GG) | Chloris ventricosa | 2 | 10 |
| Grass & grasslike (GG) | Gahnia aspera | 1 | 10 |
| Grass & grasslike (GG) | Sporobolus elongatus | 1 | 10 |
| Grass & grasslike (GG) | Elymus scaber | 2 | 9 |
| Grass & grasslike (GG) | Entolasia stricta | 2 | 9 |
| Grass & grasslike (GG) | Bothriochloa macra | 2 | 7 |
| Grass & grasslike (GG) | Cynodon dactylon | 2 | 7 |
| Grass & grasslike (GG) | Entolasia marginata | 1 | 7 |
| Grass & grasslike (GG) | Cyperus laevis | 2 | 6 |
| Grass & grasslike (GG) | Juncus usitatus | 1 | 6 |
| Grass & grasslike (GG) | Lachnagrostis aemula | 1 | 6 |
| Grass & grasslike (GG) | Paspalum orbiculare | 2 | 6 |
| Grass & grasslike (GG) | Capillipedium spicigerum | 1 | 5 |
| Grass & grasslike (GG) | Ottochloa gracillima | 2 | 5 |
| Grass & grasslike (GG) | Urochloa foliosa | 1 | 5 |
| Grass & grasslike (GG) | Carex appressa | 1 | 3 |
| Grass & grasslike (GG) | Cenchrus caliculatus | 1 | 3 |
| Grass & grasslike (GG) | Dichanthium tenue | 2 | 3 |
| Grass & grasslike (GG) | Digitaria didactyla | 4 | 3 |
| Grass & grasslike (GG) | Rytidosperma tenuius | 3 | 3 |
| Grass & grasslike (GG) | Alloteropsis semialata | 1 | 2 |
| Grass & grasslike (GG) | Austrostipa ramosissima | 2 | 2 |
| Grass & grasslike (GG) | Austrostipa verticillata | 1 | 2 |
| Grass & grasslike (GG) | Cenchrus purpurascens | 1 | 2 |
| Grass & grasslike (GG) | Cyperus cyperoides | 1 | 2 |
| Grass & grasslike (GG) | Cyperus enervis | 2 | 2 |
| Grass & grasslike (GG) | Cyperus leiocaulon | 1 | 2 |
| Grass & grasslike (GG) | Cyperus mirus | 2 | 2 |
| Grass & grasslike (GG) | Cyperus polystachyos | 1 | 2 |
| Grass & grasslike (GG) | Digitaria breviglumis | 1 | 2 |
| Grass & grasslike (GG) | Echinopogon intermedius | 1 | 2 |
| Grass & grasslike (GG) | Eragrostis sororia | 2 | 2 |
| Grass & grasslike (GG) | Heteropogon contortus | 1 | 2 |

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|---|---|---|---|
| Grass & grasslike (GG) | Juncus subsecundus | 1 | 2 |
| Grass & grasslike (GG) | Lepidosperma gunnii | 2 | 2 |
| Grass & grasslike (GG) | Lepidosperma laterale | 1 | 2 |
| Grass & grasslike (GG) | Luzula flaccida | 2 | 2 |
| Other (OG) | Glycine tabacina | 2 | 92 |
| Other (OG) | Desmodium varians | 2 | 60 |
| Other (OG) | Geitonoplesium cymosum | 1 | 56 |
| Other (OG) | Glycine clandestina | 1 | 36 |
| Other (OG) | Pandorea pandorana subsp. pandorana | 1 | 34 |
| Other (OG) | Polymeria calycina | 2 | 32 |
| Other (OG) | Maclura cochinchinensis | 1 | 25 |
| Other (OG) | Glycine microphylla | 1 | 18 |
| Other (OG) | Hardenbergia violacea | 1 | 18 |
| Other (OG) | Stephania japonica var. discolor | 1 | 17 |
| Other (OG) | Eustrephus latifolius | 1 | 15 |
| Other (OG) | Hibbertia scandens | 1 | 15 |
| Other (OG) | Clematis glycinoides | 1 | 13 |
| Other (OG) | Clematis aristata | 1 | 9 |
| Other (OG) | Jasminum suavissimum | 1 | 9 |
| Other (OG) | Parsonsia straminea | 1 | 9 |
| Other (OG) | Cayratia clematidea | 1 | 7 |
| Other (OG) | Billardiera scandens | 1 | 6 |
| Other (OG) | Smilax australis | 1 | 6 |
| Other (OG) | Convolvulus erubescens | 1 | 5 |
| Other (OG) | Jasminum volubile | 1 | 5 |
| Other (OG) | Marsdenia suaveolens | 1 | 5 |
| Other (OG) | Passiflora cinnabarina | 2 | 3 |
| Other (OG) | Xanthorrhoea glauca | 5 | 3 |
| Other (OG) | Cissus antarctica | 1 | 2 |
| Other (OG) | Clematicissus opaca | 1 | 2 |
| Other (OG) | Cordyline stricta | 1 | 2 |
| Other (OG) | Cymbidium suave | 1 | 2 |
| Other (OG) | Dendrophthoe vitellina | 1 | 2 |
| Other (OG) | Galactia tenuiflora | 1 | 2 |
| Other (OG) | Glycine cyrtoloba | 3 | 2 |
| Other (OG) | Glycine tomentella | 2 | 2 |
| Other (OG) | Kennedia rubicunda | 1 | 2 |
| Other (OG) | Ripogonum brevifolium | 1 | 2 |
| Other (OG) | Vigna vexillata | 1 | 2 |
| Shrub (SG) | Breynia oblongifolia | 1 | 49 |
| Shrub (SG) | Acacia implexa | 1 | 42 |
| Shrub (SG) | Rubus parvifolius | 2 | 26 |
| Shrub (SG) | Exocarpos cupressiformis | 1 | 25 |

| | | | |
|---|---|---|---|
| Shrub (SG) | Leucopogon juniperinus | 1 | 17 |
| Shrub (SG) | Pimelea linifolia | 1 | 15 |
| Shrub (SG) | Eremophila debilis | 1 | 14 |
| Shrub (SG) | Denhamia silvestris | 1 | 13 |
| Shrub (SG) | Jacksonia scoparia | 1 | 13 |
| Shrub (SG) | Ozothamnus diosmifolius | 1 | 13 |
| Shrub (SG) | Pittosporum multiflorum | 1 | 11 |
| Shrub (SG) | Acacia floribunda | 1 | 10 |
| Shrub (SG) | Bursaria spinosa | 1 | 10 |
| Shrub (SG) | Dodonaea viscosa | 1 | 10 |
| Shrub (SG) | Hibbertia obtusifolia | 1 | 7 |
| Shrub (SG) | Persoonia media | 1 | 7 |
| Shrub (SG) | Pittosporum revolutum | 1 | 7 |
| Shrub (SG) | Capparis arborea | 1 | 6 |
| Shrub (SG) | Trema tomentosa var. aspera | 1 | 6 |
| Shrub (SG) | Abutilon oxycarpum | 1 | 5 |
| Shrub (SG) | Acacia irrorata | 1 | 5 |
| Shrub (SG) | Alectryon subcinereus | 1 | 5 |
| Shrub (SG) | Polyscias sambucifolia | 1 | 5 |
| Shrub (SG) | Solanum campanulatum | 1 | 5 |
| Shrub (SG) | Acacia falcata | 1 | 3 |
| Shrub (SG) | Acacia longissima | 1 | 3 |
| Shrub (SG) | Alectryon subdentatus f. subdentatus | 1 | 3 |
| Shrub (SG) | Calotis dentex | 1 | 3 |
| Shrub (SG) | Cassinia quinquefaria | 1 | 3 |
| Shrub (SG) | Duboisia myoporoides | 2 | 3 |
| Shrub (SG) | Exocarpos strictus | 1 | 3 |
| Shrub (SG) | Ficus coronata | 1 | 3 |
| Shrub (SG) | Melaleuca styphelioides | 2 | 3 |
| Shrub (SG) | Myoporum acuminatum | 1 | 3 |
| Shrub (SG) | Myrsine variabilis | 1 | 3 |
| Shrub (SG) | Persoonia linearis | 1 | 3 |
| Shrub (SG) | Solanum stelligerum | 1 | 3 |
| Shrub (SG) | Acacia gunnii | 2 | 2 |
| Shrub (SG) | Acacia ulicifolia | 1 | 2 |
| Shrub (SG) | Acronychia oblongifolia | 2 | 2 |
| Shrub (SG) | Aphananthe philippinensis | 1 | 2 |
| Shrub (SG) | Daviesia genistifolia | 2 | 2 |
| Shrub (SG) | Daviesia ulicifolia | 1 | 2 |
| Shrub (SG) | Dodonaea triquetra | 1 | 2 |
| Shrub (SG) | Elaeodendron australe | 1 | 2 |
| Shrub (SG) | Hymenosporum flavum | 1 | 2 |
| Shrub (SG) | Leptospermum polyanthum | 1 | 2 |

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|---|---|---|---|
| Shrub (SG) | Leucopogon trichostylus | 1 | 2 |
| Shrub (SG) | Myrsine howittiana | 1 | 2 |
| Shrub (SG) | Persoonia stradbrokensis | 1 | 2 |
| Shrub (SG) | Phyllanthus gunnii | 1 | 2 |
| Shrub (SG) | Pomaderris vellea | 1 | 2 |
| Shrub (SG) | Rhodamnia rubescens | 1 | 2 |
| Shrub (SG) | Rubus rosifolius | 1 | 2 |
| Shrub (SG) | Sannantha angusta | 1 | 2 |
| Shrub (SG) | Sannantha similis | 1 | 2 |
| Shrub (SG) | Tabernaemontana pandacaqui | 1 | 2 |
| Tree (TG) | Eucalyptus tereticornis | 3 | 55 |
| Tree (TG) | Notelaea longifolia | 1 | 42 |
| Tree (TG) | Eucalyptus amplifolia | 3 | 38 |
| Tree (TG) | Eucalyptus eugenioides | 3 | 37 |
| Tree (TG) | Eucalyptus moluccana | 3 | 32 |
| Tree (TG) | Glochidion ferdinandi | 1 | 28 |
| Tree (TG) | Angophora subvelutina | 1 | 25 |
| Tree (TG) | Corymbia intermedia | 3 | 25 |
| Tree (TG) | Acacia melanoxylon | 1 | 22 |
| Tree (TG) | Alphitonia excelsa | 1 | 19 |
| Tree (TG) | Allocasuarina torulosa | 1 | 15 |
| Tree (TG) | Eucalyptus siderophloia | 3 | 15 |
| Tree (TG) | Angophora floribunda | 3 | 14 |
| Tree (TG) | Clerodendrum tomentosum | 1 | 13 |
| Tree (TG) | Eucalyptus carnea | 3 | 13 |
| Tree (TG) | Melia azedarach | 1 | 13 |
| Tree (TG) | Corymbia maculata | 3 | 10 |
| Tree (TG) | Eucalyptus crebra | 3 | 10 |
| Tree (TG) | Eucalyptus propinqua | 1 | 9 |
| Tree (TG) | Brachychiton populneus | 1 | 7 |
| Tree (TG) | Mallotus philippensis | 1 | 7 |
| Tree (TG) | Alectryon tomentosus | 1 | 5 |
| Tree (TG) | Allocasuarina littoralis | 1 | 5 |
| Tree (TG) | Grevillea robusta | 1 | 5 |
| Tree (TG) | Acacia maidenii | 1 | 3 |
| Tree (TG) | Cupaniopsis parvifolia | 2 | 3 |
| Tree (TG) | Denhamia bilocularis | 1 | 3 |
| Tree (TG) | Eucalyptus canaliculata | 3 | 3 |
| Tree (TG) | Eucalyptus globoidea | 1 | 3 |
| Tree (TG) | Eucalyptus melliodora | 3 | 3 |
| Tree (TG) | Guioa semiglauca | 1 | 3 |
| Tree (TG) | Tristaniopsis laurina | 1 | 3 |
| Tree (TG) | Acacia binervata | 1 | 2 |

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|---|---|---|---|
| Tree (TG) | Acacia blakei | 1 | 2 |
| Tree (TG) | Croton stigmatosus | 1 | 2 |
| Tree (TG) | Elaeocarpus obovatus | 1 | 2 |
| Tree (TG) | Elattostachys xylocarpa | 1 | 2 |
| Tree (TG) | Eucalyptus microcorys | 3 | 2 |
| Tree (TG) | Eucalyptus resinifera | 3 | 2 |
| Tree (TG) | Jagera pseudorhus var. pseudorhus | 1 | 2 |
| Tree (TG) | Lophostemon confertus | 1 | 2 |
| Tree (TG) | Lophostemon suaveolens | 1 | 2 |

# BioNet Vegetation Classification - Community Profile Report

***Plant Community Type ID (PCT ID):*** 4079

***PCT Name:*** Northern Hinterland Grassy River Oak Forest
***Classification Confidence Level:*** 2-High
***Total Number of Replicates:*** 23
***Number of Primary Replicates:*** 13
***Number of Secondary Replicates:*** 10
***Vegetation Description:*** A tall to very tall, sparse to dense Casuarina forest, which occurs on creek flats and river beds of the upper catchments of north coast rivers, from east of Tenterfield to the upper Hunter River catchment, north coast. Casuarina cunninghamiana is the main canopy species and almost always present, while other trees are present rarely with low cover, including Angophora subvelutina, Eucalyptus tereticornis and Eucalyptus dorrigoensis. The mid-stratum is comprised of scattered small trees or shrub thickets, very frequently including Ficus coronata, with the exotic shrub Lantana camara sometimes abundant. The ground layer is usually grassy, almost always including grasses Microlaena stipoides and Oplismenus aemulus, and very frequently forbs Urtica incisa, Rumex brownii, Geranium solanderi and Commelina cyanea. The ferns Adiantum aethiopicum and Pellaea falcata are common. This PCT occurs mainly in moderately warm, moderately wet locations receiving 750-1200 mm mean annual rainfall, at medium elevations mostly between 200 and 700 metres asl. It occurs on a range of lithologies, including sediments, metasediments and granite. It is one of several PCTs on the north coast in which Casuarina cunninghamiana is a frequent canopy species, with the distribution largely determined by climate and partly by characteristics of local topography. For example, in warmer and wetter areas to the east, or in sheltered valleys, it may be replaced by PCTs 3020 or 4077.
***Vegetation Formation:*** Forested Wetlands;
***Vegetation Class:*** Eastern Riverine Forests;
***IBRA Bioregion(s):*** New England Tablelands; NSW North Coast;
***IBRA Sub-region(s):*** Northeast Forest Lands; Chaelundi; Dalmorton; Guy Fawkes; Macleay Gorges; Macleay Hastings; Mummel Escarpment; Rocky River Gorge; Tomalla;
***LGA:*** ARMIDALE REGIONAL; CLARENCE VALLEY; GLEN INNES SEVERN; MID-COAST; TENTERFIELD; UPPER HUNTER; WALCHA;
***Elevation (m) (Min, Median, Max):*** 131.2 458.9 873.2
***Annual Rainfall (mm) (Min, Median, Max):*** 798 929 1137
***Annual Mean Temperature (deg C) (Min, Median, Max):*** 13.04 15.57 17.47
***Median Native Species Richness per plot:*** 38
***TEC Assessed:*** No associated TEC
***TEC List:***
***TEC Comments:***
***PCT Percent Cleared:*** 47.50
***PCT Definition Status:*** Approved

## *Species By Growth Form Group*

| Growth Form Group | Species | Median cover score | Frequency |
|---|---|---|---|
| Fern (EG) | Adiantum aethiopicum | 2 | 62 |
| Fern (EG) | Cyclosorus dentatus | 2 | 54 |
| Fern (EG) | Pellaea falcata | 2 | 54 |
| Fern (EG) | Cheilanthes sieberi subsp. sieberi | 2 | 31 |
| Fern (EG) | Pteridium esculentum | 3 | 31 |
| Fern (EG) | Pyrrosia rupestris | 1 | 31 |
| Fern (EG) | Adiantum hispidulum | 1 | 24 |
| Fern (EG) | Hypolepis glandulifera | 2 | 24 |
| Fern (EG) | Pyrrosia confluens var. confluens | 2 | 24 |
| Fern (EG) | Pteris tremula | 1 | 16 |
| Fern (EG) | Adiantum formosum | 2 | 8 |
| Fern (EG) | Asplenium flabellifolium | 1 | 8 |
| Fern (EG) | Blechnum minus | 1 | 8 |
| Fern (EG) | Blechnum nudum | 2 | 8 |
| Fern (EG) | Blechnum spinulosum | 1 | 8 |
| Fern (EG) | Diplazium assimile | 1 | 8 |
| Fern (EG) | Doodia aspera | 1 | 8 |

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|---|---|---|---|
| Fern (EG) | Pellaea paradoxa | 2 | 8 |
| Fern (EG) | Platycerium superbum | 2 | 8 |
| Forb (FG) | Geranium solanderi | 2 | 85 |
| Forb (FG) | Rumex brownii | 1 | 85 |
| Forb (FG) | Urtica incisa | 2 | 85 |
| Forb (FG) | Commelina cyanea | 2 | 77 |
| Forb (FG) | Hydrocotyle tripartita | 2 | 54 |
| Forb (FG) | Nyssanthes diffusa | 1 | 54 |
| Forb (FG) | Plectranthus parviflorus | 1 | 54 |
| Forb (FG) | Sigesbeckia orientalis subsp. orientalis | 1 | 54 |
| Forb (FG) | Lobelia purpurascens | 1 | 47 |
| Forb (FG) | Persicaria hydropiper | 1 | 47 |
| Forb (FG) | Dichondra repens | 2 | 39 |
| Forb (FG) | Oxalis chnoodes | 2 | 39 |
| Forb (FG) | Plantago debilis | 1 | 39 |
| Forb (FG) | Youngia japonica | 1 | 39 |
| Forb (FG) | Aneilema acuminatum | 2 | 31 |
| Forb (FG) | Hackelia latifolia | 1 | 31 |
| Forb (FG) | Persicaria decipiens | 2 | 31 |
| Forb (FG) | Rostellularia adscendens | 2 | 31 |
| Forb (FG) | Viola hederacea | 2 | 31 |
| Forb (FG) | Hybanthus stellarioides | 2 | 24 |
| Forb (FG) | Hydrocotyle sibthorpioides | 1 | 24 |
| Forb (FG) | Typhonium brownii | 2 | 24 |
| Forb (FG) | Alternanthera denticulata | 2 | 16 |
| Forb (FG) | Aneilema biflorum | 2 | 16 |
| Forb (FG) | Cardamine paucijuga | 2 | 16 |
| Forb (FG) | Dichondra sp. Inglewood | 2 | 16 |
| Forb (FG) | Dysphania pumilio | 1 | 16 |
| Forb (FG) | Einadia trigonos | 1 | 16 |
| Forb (FG) | Euchiton japonicus | 1 | 16 |
| Forb (FG) | Hypericum japonicum | 1 | 16 |
| Forb (FG) | Oxalis perennans | 2 | 16 |
| Forb (FG) | Oxalis radicosa | 2 | 16 |
| Forb (FG) | Oxytes brachypoda | 1 | 16 |
| Forb (FG) | Pseuderanthemum variabile | 2 | 16 |
| Forb (FG) | Ranunculus plebeius | 2 | 16 |
| Forb (FG) | Viola caleyana | 2 | 16 |
| Forb (FG) | Acaena novae-zelandiae | 1 | 8 |
| Forb (FG) | Arthropodium milleflorum | 1 | 8 |
| Forb (FG) | Callitriche muelleri | 1 | 8 |
| Forb (FG) | Centella asiatica | 2 | 8 |
| Forb (FG) | Crassula sieberiana | 1 | 8 |

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|---|---|---|---|
| Forb (FG) | Daucus glochidiatus | 1 | 8 |
| Forb (FG) | Dendrobium speciosum | 2 | 8 |
| Forb (FG) | Dianella longifolia | 1 | 8 |
| Forb (FG) | Elatostema reticulatum | 1 | 8 |
| Forb (FG) | Emilia sonchifolia var. javanica | 1 | 8 |
| Forb (FG) | Epilobium billardierianum | 1 | 8 |
| Forb (FG) | Euchiton sphaericus | 1 | 8 |
| Forb (FG) | Euphorbia drummondii | 1 | 8 |
| Forb (FG) | Galium leiocarpum | 2 | 8 |
| Forb (FG) | Galium leptogonium | 1 | 8 |
| Forb (FG) | Geranium potentilloides | 1 | 8 |
| Forb (FG) | Gratiola pedunculata | 1 | 8 |
| Forb (FG) | Gratiola peruviana | 2 | 8 |
| Forb (FG) | Gymnostachys anceps | 2 | 8 |
| Forb (FG) | Hackelia suaveolens | 1 | 8 |
| Forb (FG) | Hydrocotyle acutiloba | 2 | 8 |
| Forb (FG) | Hydrocotyle laxiflora | 1 | 8 |
| Forb (FG) | Hypericum gramineum | 1 | 8 |
| Forb (FG) | Hypoxis hygrometrica | 1 | 8 |
| Forb (FG) | Lobelia pedunculata | 2 | 8 |
| Forb (FG) | Opercularia diphylla | 1 | 8 |
| Forb (FG) | Peperomia blanda var. floribunda | 2 | 8 |
| Forb (FG) | Persicaria lapathifolia | 2 | 8 |
| Forb (FG) | Persicaria praetermissa | 2 | 8 |
| Forb (FG) | Picris angustifolia | 1 | 8 |
| Forb (FG) | Plectranthus suaveolens | 1 | 8 |
| Forb (FG) | Pterostylis pedunculata | 1 | 8 |
| Forb (FG) | Ranunculus lappaceus | 1 | 8 |
| Forb (FG) | Ranunculus sessiliflorus | 2 | 8 |
| Forb (FG) | Senecio biserratus | 1 | 8 |
| Forb (FG) | Senecio diaschides | 1 | 8 |
| Forb (FG) | Senecio prenanthoides | 1 | 8 |
| Forb (FG) | Stellaria angustifolia | 1 | 8 |
| Forb (FG) | Stellaria flaccida | 2 | 8 |
| Forb (FG) | Swainsona galegifolia | 1 | 8 |
| Forb (FG) | Teucrium argutum | 1 | 8 |
| Forb (FG) | Vernonia cinerea | 1 | 8 |
| Forb (FG) | Veronica plebeia | 1 | 8 |
| Forb (FG) | Viola banksii | 2 | 8 |
| Forb (FG) | Viola betonicifolia | 1 | 8 |
| Forb (FG) | Vittadinia cuneata | 1 | 8 |
| Forb (FG) | Vittadinia dissecta | 2 | 8 |
| Forb (FG) | Vittadinia tenuissima | 1 | 8 |

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|---|---|---|---|
| Forb (FG) | Wahlenbergia communis | 1 | 8 |
| Forb (FG) | Wahlenbergia gracilis | 1 | 8 |
| Grass & grasslike (GG) | Microlaena stipoides | 3 | 93 |
| Grass & grasslike (GG) | Oplismenus aemulus | 2 | 93 |
| Grass & grasslike (GG) | Echinopogon ovatus | 1 | 62 |
| Grass & grasslike (GG) | Carex appressa | 2 | 54 |
| Grass & grasslike (GG) | Cyperus imbecillis | 1 | 39 |
| Grass & grasslike (GG) | Juncus usitatus | 1 | 39 |
| Grass & grasslike (GG) | Poa labillardierei var. labillardierei | 3 | 39 |
| Grass & grasslike (GG) | Eragrostis leptostachya | 1 | 31 |
| Grass & grasslike (GG) | Lomandra longifolia | 2 | 31 |
| Grass & grasslike (GG) | Entolasia stricta | 2 | 24 |
| Grass & grasslike (GG) | Lomandra hystrix | 2 | 24 |
| Grass & grasslike (GG) | Sporobolus creber | 2 | 24 |
| Grass & grasslike (GG) | Aristida ramosa | 1 | 16 |
| Grass & grasslike (GG) | Austrostipa ramosissima | 2 | 16 |
| Grass & grasslike (GG) | Austrostipa verticillata | 1 | 16 |
| Grass & grasslike (GG) | Bothriochloa macra | 2 | 16 |
| Grass & grasslike (GG) | Cyperus laevis | 1 | 16 |
| Grass & grasslike (GG) | Cyperus lhotskyanus | 2 | 16 |
| Grass & grasslike (GG) | Cyperus sphaeroideus | 2 | 16 |
| Grass & grasslike (GG) | Gahnia aspera | 1 | 16 |
| Grass & grasslike (GG) | Bothriochloa decipiens var. decipiens | 1 | 8 |
| Grass & grasslike (GG) | Capillipedium parviflorum | 1 | 8 |
| Grass & grasslike (GG) | Carex brunnea | 1 | 8 |
| Grass & grasslike (GG) | Carex inversa | 1 | 8 |
| Grass & grasslike (GG) | Cenchrus caliculatus | 1 | 8 |
| Grass & grasslike (GG) | Chloris ventricosa | 2 | 8 |
| Grass & grasslike (GG) | Chrysopogon filipes | 1 | 8 |
| Grass & grasslike (GG) | Cymbopogon refractus | 1 | 8 |
| Grass & grasslike (GG) | Cyperus lucidus | 1 | 8 |
| Grass & grasslike (GG) | Cyperus mirus | 1 | 8 |
| Grass & grasslike (GG) | Cyperus sanguinolentus | 1 | 8 |
| Grass & grasslike (GG) | Cyperus tetraphyllus | 1 | 8 |
| Grass & grasslike (GG) | Echinopogon caespitosus | 1 | 8 |
| Grass & grasslike (GG) | Elymus scaber | 1 | 8 |
| Grass & grasslike (GG) | Entolasia marginata | 2 | 8 |
| Grass & grasslike (GG) | Imperata cylindrica | 2 | 8 |
| Grass & grasslike (GG) | Isolepis inundata | 1 | 8 |
| Grass & grasslike (GG) | Oplismenus undulatifolius | 3 | 8 |
| Grass & grasslike (GG) | Panicum bisulcatum | 1 | 8 |
| Grass & grasslike (GG) | Panicum effusum | 1 | 8 |
| Grass & grasslike (GG) | Paspalidium distans | 1 | 8 |

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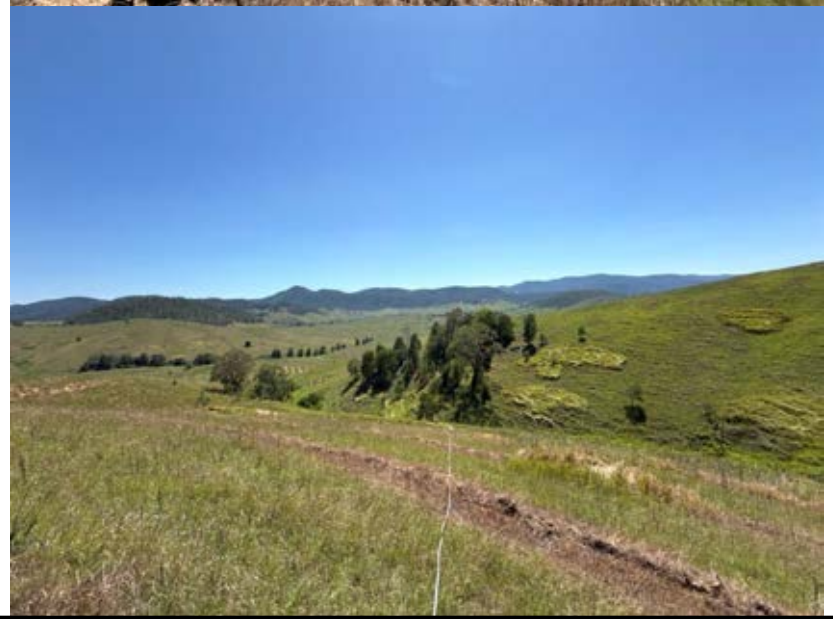
|---|---|---|---|
| Grass & grasslike (GG) | Paspalum distichum | 1 | 8 |
| Grass & grasslike (GG) | Poa sieberiana | 1 | 8 |
| Grass & grasslike (GG) | Sorghum leiocladum | 1 | 8 |
| Grass & grasslike (GG) | Urochloa foliosa | 1 | 8 |
| Other (OG) | Geitonoplesium cymosum | 1 | 62 |
| Other (OG) | Pandorea pandorana subsp. pandorana | 1 | 62 |
| Other (OG) | Stephania japonica var. discolor | 2 | 54 |
| Other (OG) | Cayratia clematidea | 1 | 47 |
| Other (OG) | Cissus antarctica | 1 | 39 |
| Other (OG) | Dendrobium cucumerinum | 2 | 39 |
| Other (OG) | Parsonsia straminea | 2 | 39 |
| Other (OG) | Clematis glycinoides | 1 | 31 |
| Other (OG) | Glycine tabacina | 1 | 31 |
| Other (OG) | Maclura cochinchinensis | 2 | 31 |
| Other (OG) | Dendrobium linguiforme | 2 | 24 |
| Other (OG) | Glycine clandestina | 1 | 24 |
| Other (OG) | Neoachmandra cunninghamii | 1 | 24 |
| Other (OG) | Aphanopetalum resinosum | 2 | 16 |
| Other (OG) | Desmodium varians | 2 | 16 |
| Other (OG) | Eustrephus latifolius | 1 | 16 |
| Other (OG) | Legnephora moorei | 1 | 16 |
| Other (OG) | Cissus hypoglauca | 1 | 8 |
| Other (OG) | Clematis aristata | 1 | 8 |
| Other (OG) | Deeringia amaranthoides | 1 | 8 |
| Other (OG) | Dendrobium gracilicaule | 2 | 8 |
| Other (OG) | Dioscorea transversa | 1 | 8 |
| Other (OG) | Diplocyclos palmatus | 1 | 8 |
| Other (OG) | Glycine microphylla | 2 | 8 |
| Other (OG) | Jasminum volubile | 2 | 8 |
| Other (OG) | Marsdenia rostrata | 1 | 8 |
| Other (OG) | Ozothamnus bidwillii | 1 | 8 |
| Other (OG) | Pandorea jasminoides | 1 | 8 |
| Other (OG) | Sarcochilus ceciliae | 1 | 8 |
| Other (OG) | Tylophora paniculata | 1 | 8 |
| Other (OG) | Xanthorrhoea glauca | 1 | 8 |
| Shrub (SG) | Ficus coronata | 1 | 70 |
| Shrub (SG) | Rubus parvifolius | 1 | 47 |
| Shrub (SG) | Abutilon oxycarpum | 1 | 31 |
| Shrub (SG) | Melicytus dentatus | 2 | 31 |
| Shrub (SG) | Acacia irrorata | 1 | 24 |
| Shrub (SG) | Rubus rosifolius | 1 | 24 |
| Shrub (SG) | Trema tomentosa var. aspera | 1 | 24 |
| Shrub (SG) | Bursaria spinosa | 1 | 16 |

| | | | |
|---|---|---|---|
| Shrub (SG) | Callistemon sieberi | 3 | 16 |
| Shrub (SG) | Rubus moluccanus | 1 | 16 |
| Shrub (SG) | Acacia floribunda | 2 | 8 |
| Shrub (SG) | Acacia implexa | 1 | 8 |
| Shrub (SG) | Acacia ingramii | 1 | 8 |
| Shrub (SG) | Acacia longissima | 1 | 8 |
| Shrub (SG) | Alectryon subdentatus f. subdentatus | 1 | 8 |
| Shrub (SG) | Alyxia ruscifolia | 2 | 8 |
| Shrub (SG) | Breynia oblongifolia | 1 | 8 |
| Shrub (SG) | Cryptocarya rigida | 1 | 8 |
| Shrub (SG) | Hibiscus splendens | 1 | 8 |
| Shrub (SG) | Hymenosporum flavum | 1 | 8 |
| Shrub (SG) | Leptospermum polygalifolium | 1 | 8 |
| Shrub (SG) | Melaleuca bracteata | 3 | 8 |
| Shrub (SG) | Phyllanthus gunnii | 1 | 8 |
| Shrub (SG) | Solanum campanulatum | 1 | 8 |
| Shrub (SG) | Syzygium australe | 1 | 8 |
| Tree (TG) | Casuarina cunninghamiana subsp. cunninghamiana | 4 | 100 |
| Tree (TG) | Angophora subvelutina | 1 | 24 |
| Tree (TG) | Eucalyptus tereticornis | 1 | 24 |
| Tree (TG) | Streblus brunonianus | 1 | 24 |
| Tree (TG) | Eucalyptus dorrigoensis | 2 | 16 |
| Tree (TG) | Grevillea robusta | 2 | 16 |
| Tree (TG) | Melia azedarach | 3 | 16 |
| Tree (TG) | Notelaea microcarpa | 1 | 16 |
| Tree (TG) | Acacia maidenii | 1 | 8 |
| Tree (TG) | Acmena smithii | 1 | 8 |
| Tree (TG) | Brachychiton populneus | 1 | 8 |
| Tree (TG) | Ehretia acuminata var. acuminata | 1 | 8 |
| Tree (TG) | Glochidion ferdinandi | 1 | 8 |

# Appendix E: Plot Location Details

| Sampling Plot | | AA | SAA | Coordinates of permanent markers (GDA20z56) | | | | Bearing (degrees) |
|---|---|---|---|---|---|---|---|---|
| # | SurveyID | | | Start location | | End location | | |
| | | | | Easting | Northing | Easting | Northing | |
| **T01** | 3329C_T1_E | AA6 | n/a | 398757.6 | 6499254 | 398803.0 | 6499236 | 111.4 |
| **T02** | 3329C_T2_E | AA6 | n/a | 396710.2 | 6500292 | 396758.8 | 6500276 | 108.0 |
| **T03** | 3329C_T3_E | AA6 | n/a | 395511.8 | 6501826 | 395462.8 | 6501813 | 255.4 |
| **T04** | 3329C_T4_E | AA6 | n/a | 397241.0 | 6502304 | 397291.9 | 6502290 | 105.6 |
| **T05** | 3240C_T5_E | AA4 | SAA3 | 390253.7 | 6505456 | 390209.6 | 6505477 | 295.6 |
| **T06** | 3240C_T6_E | AA4 | SAA3 | 391129.7 | 6505058 | 391131.5 | 6505009 | 177.9 |
| **T07** | 3329C_T7_E | AA6 | n/a | 391489.7 | 6504567 | 391524.1 | 6504530 | 137.2 |
| **T08** | 3329C_T8_E | AA6 | n/a | 392836.4 | 6503771 | 392840.4 | 6503723 | 175.2 |
| **T11** | 3329C_T11_E | AA6 | n/a | 395545.2 | 6502722 | 395544.3 | 6502772 | 359.0 |
| **T14** | 3240C_T14_E | AA4 | SAA3 | 394364.3 | 6502318 | 394335.5 | 6502360 | 325.7 |
| **T15** | 3076C_T15_E | AA2 | n/a | 394469.1 | 6502765 | 394434.7 | 6502726 | 221.1 |
| **T18** | 3240C_T18_E | AA4 | SAA3 | 395922.4 | 6500665 | 395959.7 | 6500699 | 47.7 |
| **T19** | 3252C_T19_E | AA4 | SAA4 | 397038.8 | 6501815 | 396992.1 | 6501794 | 245.5 |
| **T20** | 4079C_T20_E | AA8 | n/a | 396800.8 | 6502519 | 396788.1 | 6502569 | 345.8 |
| **T21** | 3076B_T21_E | AA1 | n/a | 395520.3 | 6500495 | 395557.6 | 6500526 | 50.6 |
| **T22** | 3076B_T22_E | AA1 | n/a | 395847.9 | 6500498 | 395804.9 | 6500478 | 244.5 |
| **T23** | 3076C_T23_E | AA2 | n/a | 392323.0 | 6503603 | 392322.6 | 6503553 | 180.5 |
| **T24** | 3240B_T24_E | AA4 | SAA3 | 392244.9 | 6503818 | 392292.2 | 6503811 | 98.2 |
| **T27** | 3252B_T27_E | AA3 | SAA2 | 394491.4 | 6503485 | 394536.4 | 6503475 | 102.7 |
| **T29** | 3252C_T29_E | AA4 | SAA4 | 393735.6 | 6504438 | 393700.8 | 6504400 | 222.6 |
| **T32** | 4079C_T32_E | AA8 | n/a | 395430.3 | 6502111 | 395421.3 | 6502061 | 190.3 |
| **T33** | 4079C_T33_E | AA8 | n/a | 396740.5 | 6500621 | 396742.1 | 6500572 | 178.1 |
| **T34** | 4079C_T34_E | AA8 | n/a | 391766.1 | 6504599 | 391733.3 | 6504562 | 221.7 |
| **T35** | 3329B_T35_E | AA5 | n/a | 398093.6 | 6498867 | 398142.4 | 6498875 | 80.4 |
| **T36** | 3329B_T36_E | AA5 | n/a | 397855.3 | 6498918 | 397865.3 | 6498965 | 11.9 |
| **T37** | 4079C_T37_E | AA8 | n/a | 395549.1 | 6503398 | 395577.6 | 6503440 | 34.3 |
| **T38** | 4079C_T38_E | AA7 | n/a | 392182.5 | 6504307 | 392230.6 | 6504301 | 96.9 |
| **T40** | 3240B_T40_E | AA3 | SAA1 | 395406.8 | 6500525 | 395440.6 | 6500554 | 49.6 |
| **T42** | 3420B_T42_E | AA3 | SAA1 | 394798.9 | 6501588 | 394837.1 | 6501560 | 126.2 |
| **T43** | 3240B_T43_E | AA3 | SAA1 | 396040.2 | 6503306 | 396005.3 | 6503281 | 234.0 |
| **T45** | 3329B_T45_E | AA5 | n/a | 398290.0 | 6498768 | 398257.7 | 6498801 | 316.1 |
| **T46** | 4079B_T46_E | AA7 | n/a | 398327.7 | 6498778 | 398311.9 | 6498823 | 340.3 |

# Appendix F: Photos of permanent sampling plots

| Activity Area | Survey ID | | Starting point photos | End point photos |
|---|---|---|---|---|
| AA1 | 3076B_T21 | L | | |
| | | R | | |
| | | M |  | |

| Activity Area | Survey ID | | Starting point photos | End point photos |
|---|---|---|---|---|
| AA1 | 3076B_T22 | L | | |
| | | R | | |
| | | M | | |

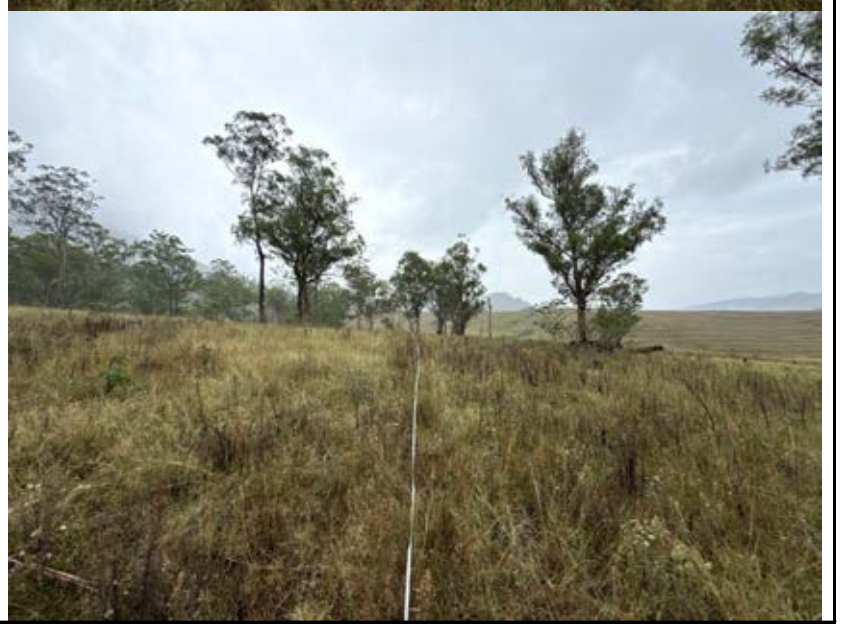
| Activity Area | Survey ID | | Starting point photos | End point photos |
|---|---|---|---|---|
| AA2 | 3076C_T15 | L | | |
| | | R | | |
| | | M | | |

| Activity Area | Survey ID | | Starting point photos | End point photos |
|---|---|---|---|---|
| AA2 | 3076C_T23 | L | | |
| | | R | | |
| | | M | | |

| Activity Area | Survey ID | | Starting point photos | End point photos |
|---|---|---|---|---|
| AA3 | 3240B_T40 | L | | |
| | | R | | |
| | | M | | |

| Activity Area | Survey ID | | Starting point photos | End point photos |
|---|---|---|---|---|
| AA3 | 3240B_T43 | L | | |
| | | R | | |
| | | M | | |

| Activity Area | Survey ID | | Starting point photos | End point photos |
|---|---|---|---|---|
| AA3 | 3252B_T27 | L | | |
| | | R | | |
| | | M | | |

| Activity Area | Survey ID | | Starting point photos | End point photos |
|---|---|---|---|---|
| AA3 | 3420B_T42 | L | | |
| | | R | | |
| | | M | |  |

| Activity Area | Survey ID | | Starting point photos | End point photos |
|---|---|---|---|---|
| AA4 | 3240B_T24 | L | | |
| | | R | | |
| | | M | | |

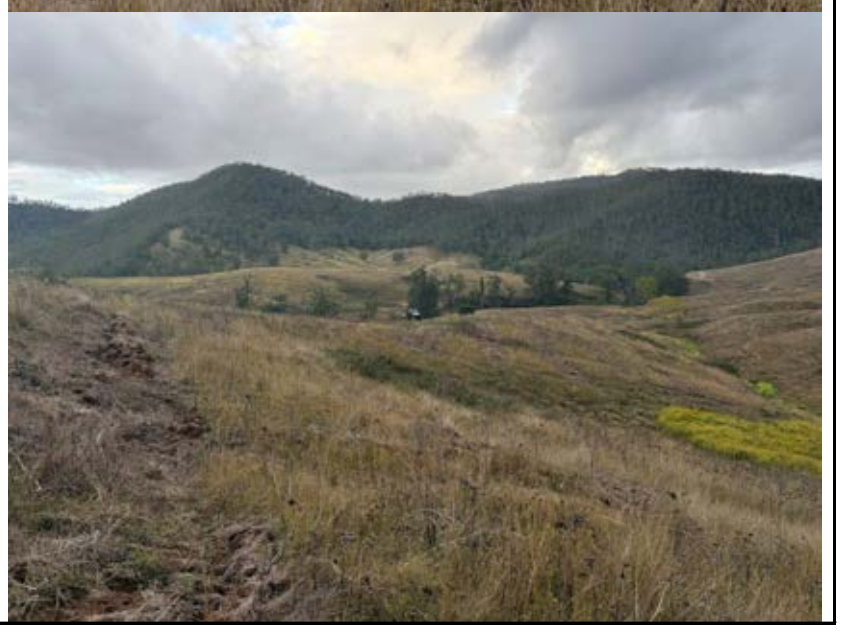
| Activity Area | Survey ID | | Starting point photos | End point photos |
|---|---|---|---|---|
| AA4 | 3240C_T14 | L | | |
| | | R | | |
| | | M | | |

| Activity Area | Survey ID | | Starting point photos | End point photos |
|---|---|---|---|---|
| AA4 | 3240C_T18 | L | | |
| | | R | | |
| | | M | | |

| Activity Area | Survey ID | | Starting point photos | End point photos |
|---|---|---|---|---|
| AA4 | 3240C_T5 | L | | |
| | | R | | |
| | | M | | |

| Activity Area | Survey ID | | Starting point photos | End point photos |
|---|---|---|---|---|
| AA4 | 3240C_T6 | L | | |
| | | R | | |
| | | M | | |

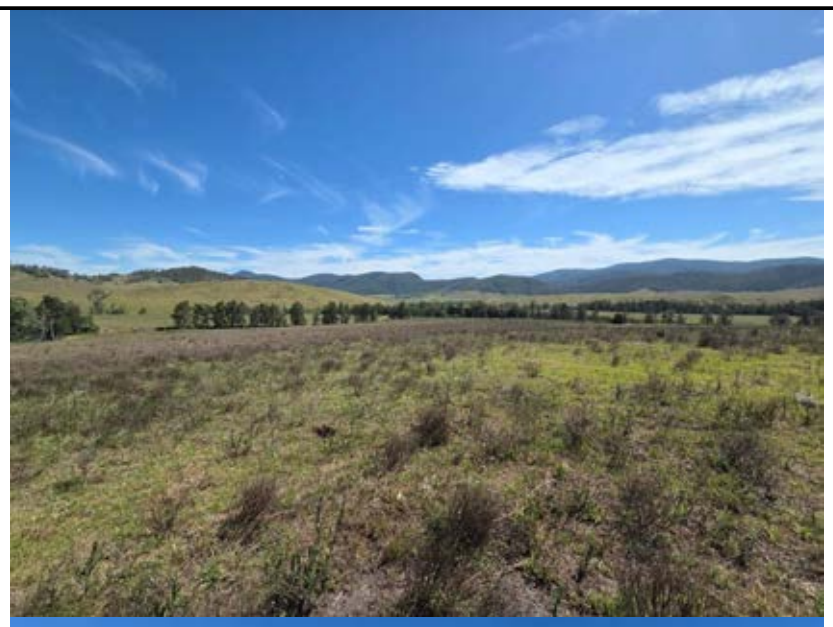
| Activity Area | Survey ID | | Starting point photos | End point photos |
|---|---|---|---|---|
| AA4 | 3252C_T19 | L | | |
| | | R | | |
| | | M | | |

| Activity Area | Survey ID | | Starting point photos | End point photos |
|---|---|---|---|---|
| AA4 | 3252C_T29 | L | | |
| | | R | | |
| | | M | |  |

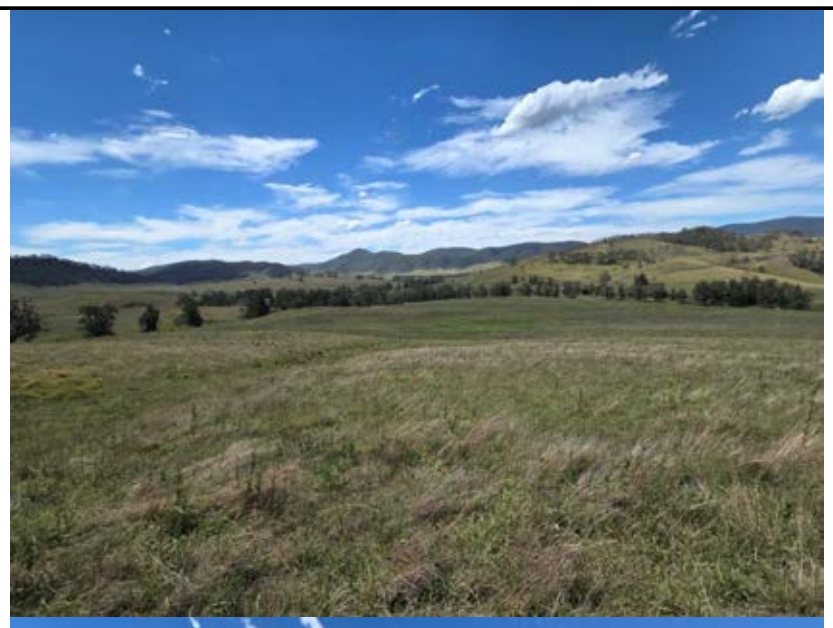
| Activity Area | Survey ID | | Starting point photos | End point photos |
|---|---|---|---|---|
| AA5 | 3329B_T35 | L | | |
| | | R | | |
| | | M | | |

| Activity Area | Survey ID | Starting point photos | End point photos |
|---|---|---|---|
| AA5 | 3329B_T36 | | |
| | | | |
| | | | |

| Activity Area | Survey ID | | Starting point photos | End point photos |
|---|---|---|---|---|
| AA5 | 3329B_T45 | L | | |
| | | R | | |
| | | M | | |

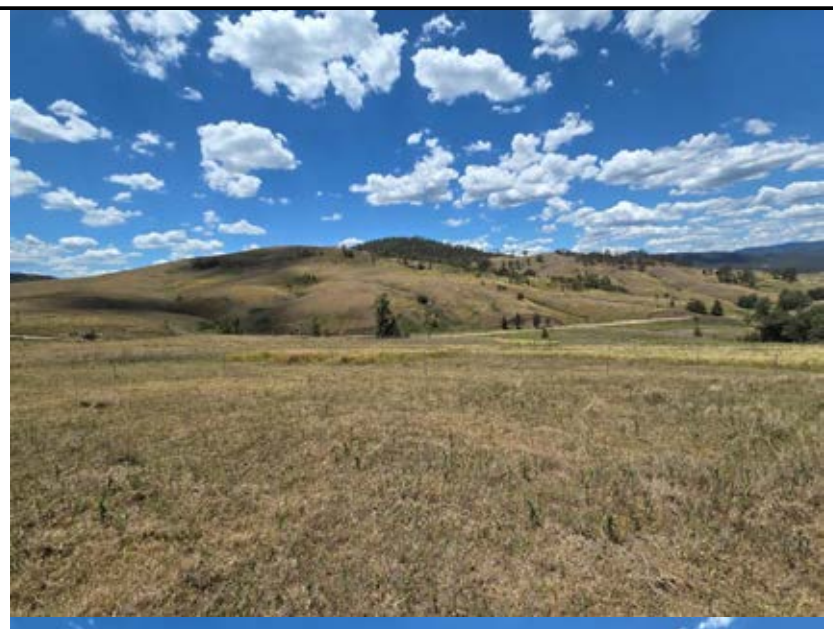
| Activity Area | Survey ID | | Starting point photos | End point photos |
|---|---|---|---|---|
| AA6 | 3329C_T1 | L |  | |
| | | R | | |
| | | M | | |

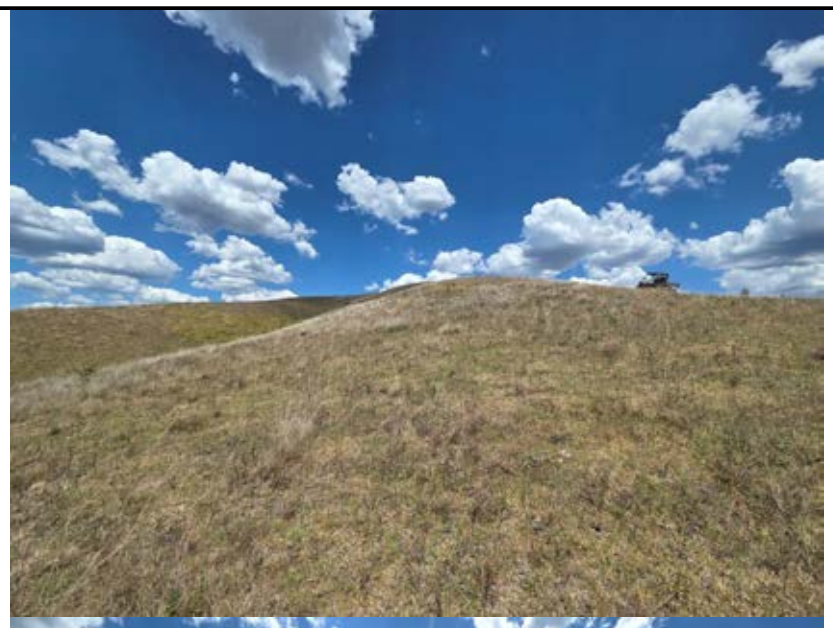
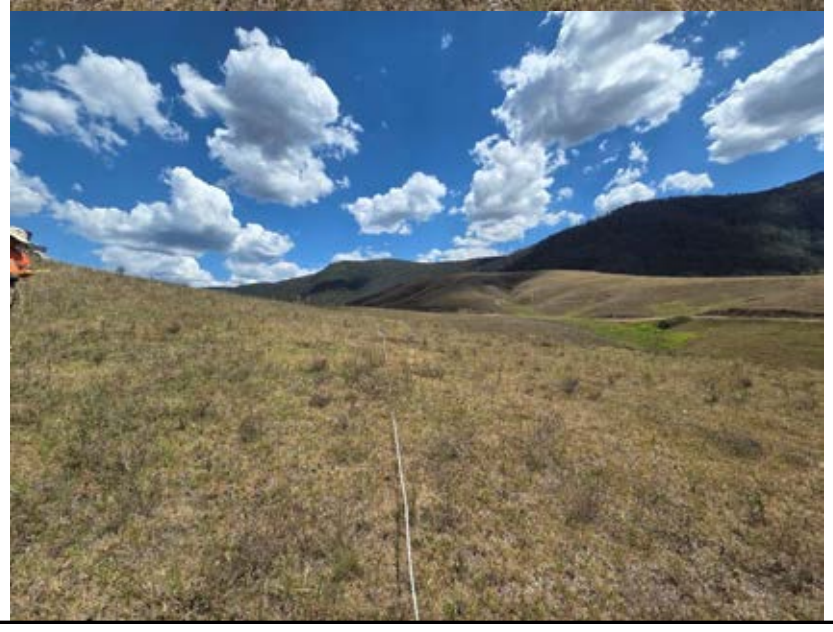
| Activity Area | Survey ID | | Starting point photos | End point photos |
|---|---|---|---|---|
| AA6 | 3329C_T11 | L | | |
| | | R | | |
| | | M | | |

| Activity Area | Survey ID | | Starting point photos | End point photos |
|---|---|---|---|---|
| AA6 | 3329C_T2 | L |  | |
| | | R | | |
| | | M | | |

| Activity Area | Survey ID | | Starting point photos | End point photos |
|---|---|---|---|---|
| AA6 | 3329C_T3 | L | | |
| | | R | | |
| | | M | | |

| Activity Area | Survey ID | | Starting point photos | End point photos |
|---|---|---|---|---|
| AA6 | 3329C_T4 | L | | |
| | | R | | |
| | | M | | |

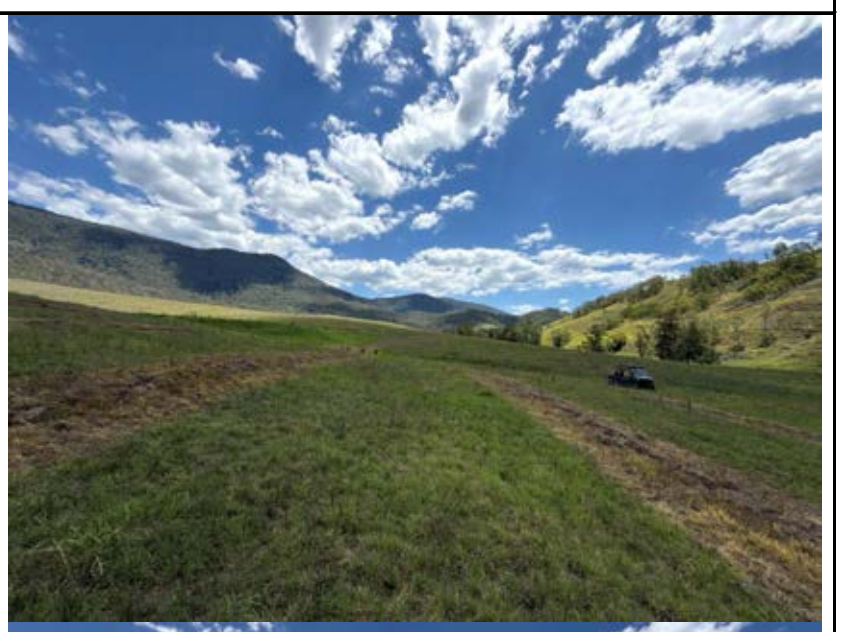
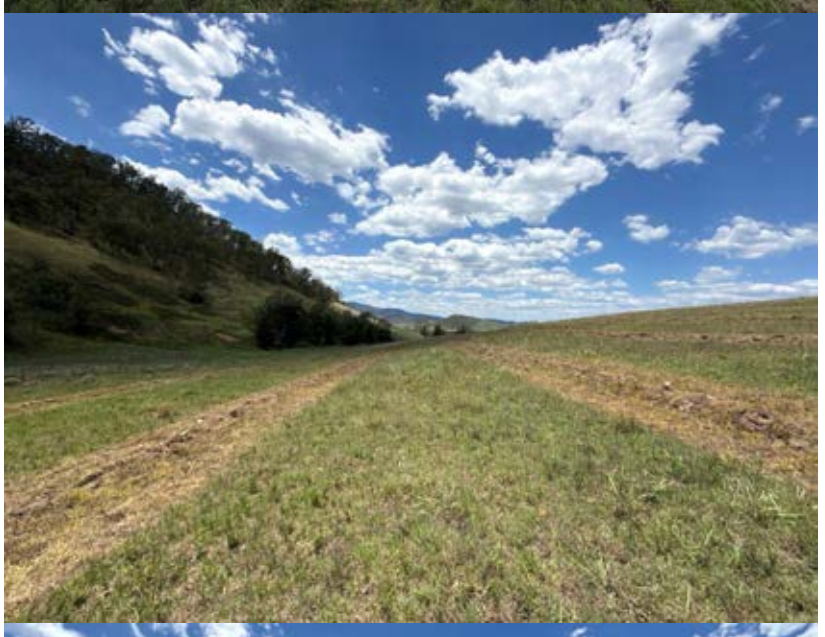
| Activity Area | Survey ID | | Starting point photos | End point photos |
|---|---|---|---|---|
| AA6 | 3329C_T7 | L |  | |
| | | R | | |
| | | M | | |

| Activity Area | Survey ID | | Starting point photos | End point photos |
|---|---|---|---|---|
| AA6 | 3329C_T8 | L |  | |
| | | R | | |
| | | M |  | |

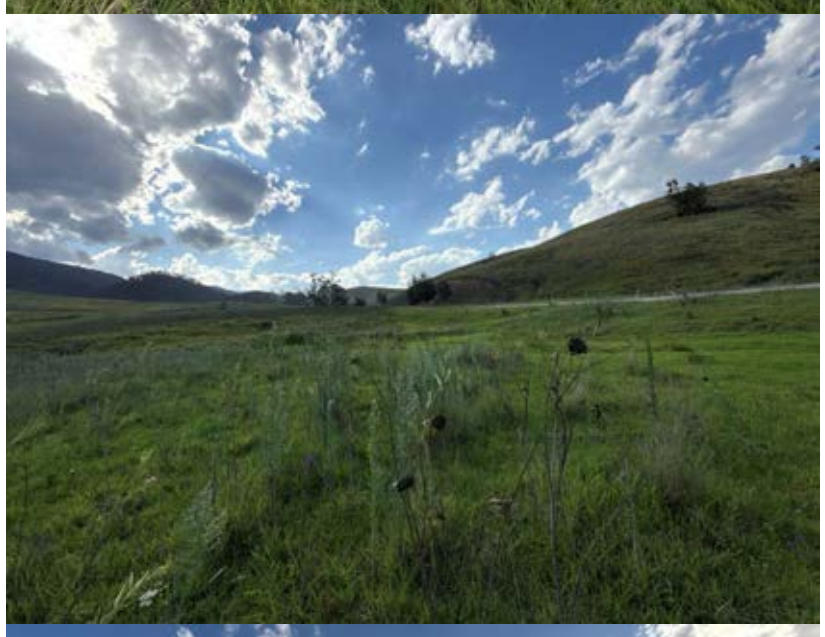
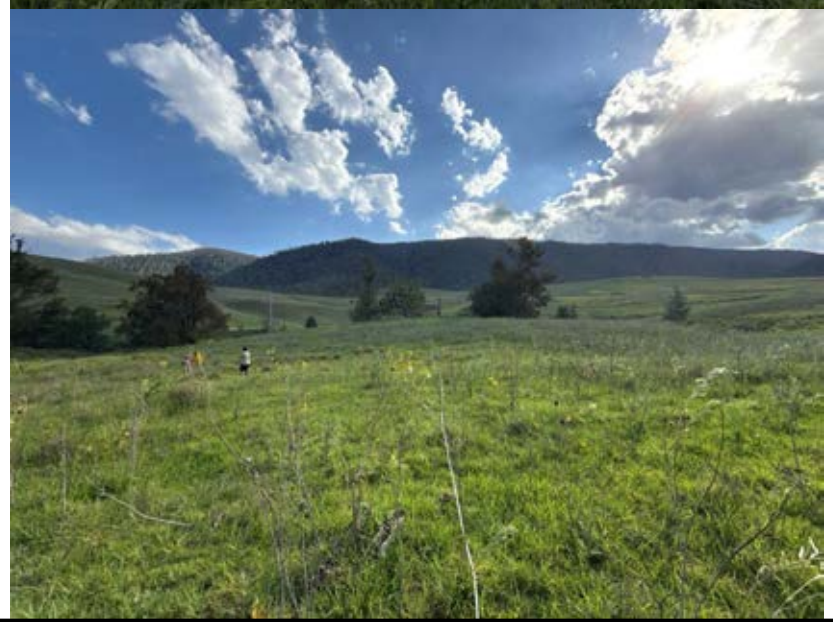
| Activity Area | Survey ID | | Starting point photos | End point photos |
|---|---|---|---|---|
| AA7 | 4079B_T46 | L | | |
| | | R | | |
| | | M | | |

| Activity Area | Survey ID | | Starting point photos | End point photos |
|---|---|---|---|---|
| AA7 | 4079C_T38 | L | | |
| | | R | | |
| | | M | | |

| Activity Area | Survey ID | | Starting point photos | End point photos |
|---|---|---|---|---|
| AA8 | 4079C_T20 | L | | |
| | | R | | |
| | | M | | |

| Activity Area | Survey ID | | Starting point photos | End point photos |
|---|---|---|---|---|
| AA8 | 4079C_T32 | L | |  |
| | | R | |  |
| | | M | | |

| Activity Area | Survey ID | | Starting point photos | End point photos |
|---|---|---|---|---|
| AA8 | 4079C_T33 | L | | |
| | | R | | |
| | | M | | |

| Activity Area | Survey ID | | Starting point photos | End point photos |
|---|---|---|---|---|
| AA8 | 4079C_T34 | L | | |
| | | R |  | |
| | | M |  | |

| Activity Area | Survey ID | | Starting point photos | End point photos |
|---|---|---|---|---|
| AA8 | 4079C_T37 | L | | |
| | | R | | |
| | | M | | |

# Appendix G: Historic Satellite Imagery

**Cooplacurripa Biodiversity Project No. 2**

**Imagery Date Stamp: 30-01-2011**

NRM Project Area Boundary (North)

SILVA CAPITAL

Date Published: 7/1/2026 2:16 PM | Scale: A4 :1:27,000

Spatial Reference: GDA2020 MGA Zone 56 | Basemap: Esri, Geoscience Australia, NASA, NGA, USGS, Vantor, Airbus, USGS, NGA, NASA, CGIAR, NCEAS, NLS, OS, NMA, Geodatastyrelsen, GSA, GSI and the GIS User Community

**Cooplacurripa Biodiversity Project No. 2**

Date Published: 7/1/2026 2:16 PM | Scale: A4 :1:22,000

**Imagery Date Stamp: 30-01-2011**

NRM Project Area Boundary (South)

SILVA CAPITAL

Spatial Reference: GDA2020 MGA Zone 56 | Basemap: Esri, Geoscience Australia, NASA, NGA, USGS, Vantor, Airbus, USGS, NGA, NASA, CGIAR, NCEAS, NLS, OS, NMA, Geodatastyrelsen, GSA, GSI and the GIS User Community

**Cooplacurripa Biodiversity Project No. 2**

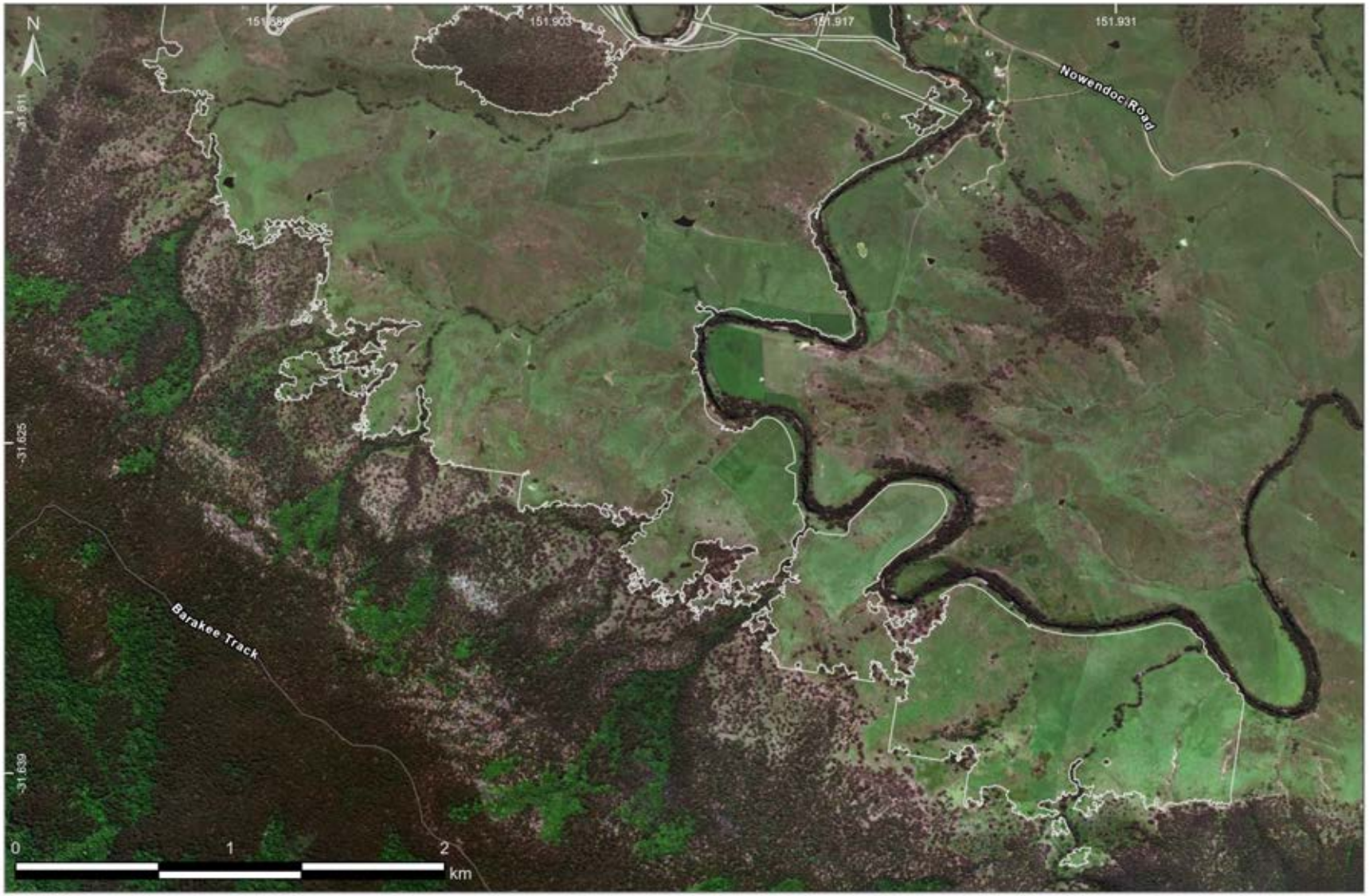
Date Published: 7/1/2026 2:16 PM | Scale: A4 :1:27,000

**Imagery Date Stamp: 10-01-2016**

NRM Project Area Boundary (North)

SILVA CAPITAL

Spatial Reference: GDA2020 MGA Zone 56 | Basemap: Esri, Geoscience Australia, NASA, NGA, USGS, Vantor, Airbus, USGS, NGA, NASA, CGIAR, NCEAS, NLS, OS, NMA, Geodatastyrelsen, GSA, GSI and the GIS User Community




**Cooplacurripa Biodiversity Project No. 2**

**Imagery Date Stamp: 10-01-2016**

NRM Project Area Boundary (South)

SILVA CAPITAL

Date Published: 7/1/2026 2:16 PM | Scale: A4 1:22,000

Spatial Reference: GDA2020 MGA Zone 56 | Basemap: Esri, Geoscience Australia, NASA, NGA, USGS, Vantor, Airbus, USGS, NGA, NASA, CGIAR, NCEAS, NLS, OS, NMA, Geodatastyrelsen, GSA, GSI and the GIS User Community

**Cooplacurripa Biodiversity Project No. 2**

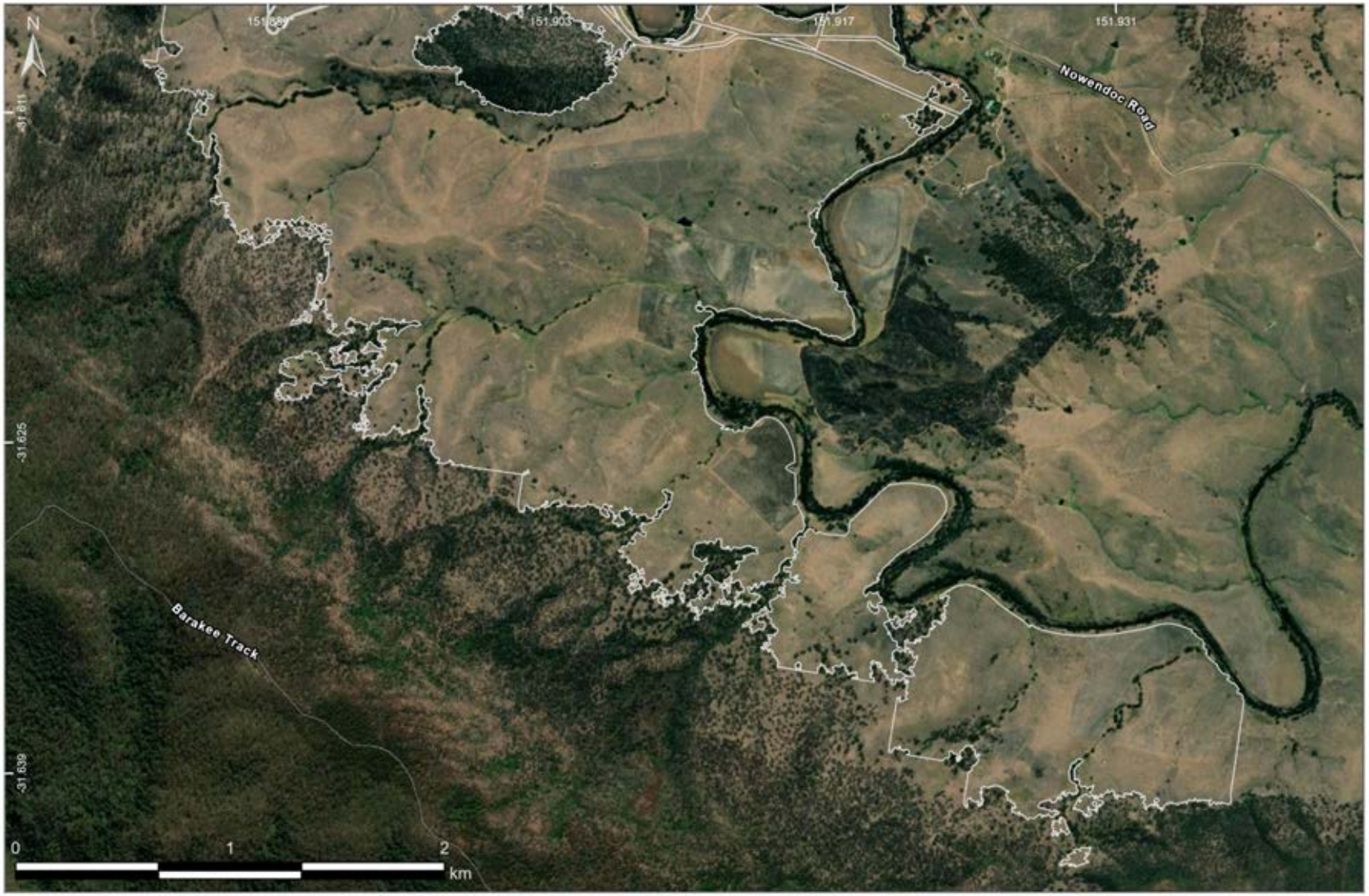
Date Published: 7/1/2026 2:16 PM | Scale: A4 :1:27,000

**Imagery Date Stamp: 10-10-2023**

NRM Project Area Boundary (North)

SILVA CAPITAL

Spatial Reference: GDA2020 MGA Zone 56 | Basemap: Esri, Geoscience Australia, NASA, NGA, USGS, Vantor, Airbus, USGS, NGA, NASA, CGIAR, NCEAS, NLS, OS, NMA, Geodatastyrelsen, GSA, GSI and the GIS User Community




**Cooplacurripa Biodiversity Project No. 2**

**Imagery Date Stamp: 10-10-2023**

NRM Project Area Boundary (South)

SILVA CAPITAL

Date Published: 7/1/2026 2:16 PM | Scale: A4 :1:22,000

Spatial Reference: GDA2020 MGA Zone 56 | Basemap: Esri, Geoscience Australia, NASA, NGA, USGS, Vantor, Airbus, USGS, NGA, NASA, CGIAR, NCEAS, NLS, OS, NMA, Geodatastyrelsen, GSA, GSI and the GIS User Community