24 DEGREE **FOREST**

KARINYA DOWNS WET SCLEROPHYLL FOREST AND RAINFOREST RESTORATION

Replanting Native Forest and Woodland Ecosystems Method

Project Plan

27 March 2026

Contents

1. Project Details

Project name	Karinya Downs Wet Sclerophyll Forest and Rainforest Restoration
NRM Project ID	NR001018
Date of project plan	27 March 2026
Project description	The Karinya Downs Wet Sclerophyll Forest and Rainforest Restoration project aims to restore wet sclerophyll forest and rainforest ecosystems on the steep slopes, riparian zones and gullies of Karinya Downs. Karinya Downs was established as a pastoral property following clearing between the late 1800's and the 1950's, starting with dairy operations and transitioned to beef cattle in the late 1980's. The project aims to extend and connect remnant vegetation by establishing dense (2,500 stems/ha) mixed-species native plantings that will improve habitat connectivity, biodiversity, fire resilience, microclimatic buffering, soil stability and water quality while maintaining the long-term productivity of the surrounding grazing enterprise.
Covenants and legal encumbrances	Water Access License – Title number WAL27369 Carbon Credits (Carbon Farming Initiative) (Reforestation by Environmental or Mallee Plantings-FullCAM) Methodology Determination 2024. ERF207666 - 24 Degree Forest – Rainforest rehabilitation on slopes and riparian zones Doon Doon Project Identification of covenants and other legal encumbrances were informed by: • search of the applicable land title register (copies or land titles were provided to the CER); • search of any applicable state or territory register relating to cultural heritage; and • search of the Register under the CFI Act 2011

Proponent Details

Name of project proponent(s)	24 Degree Forest Pty Ltd
If there are multiple proponents, the nominee for the project	NA

Project plan preparation

Name/s	Johann Theron
Contact details	Director – 24 Degree Forest Pty Ltd

Additional stakeholder details

Stakeholder Name	**Roles and responsibilities**
24 Degree Forest Pty Ltd	Project design, coordination, implementation oversight and compliance reporting.
Niche	Project design, Site Assessment Survey and Site Assessment Report, Project Plan input and associated registration documents.

Limitations and assumptions

The project assumes that native wet sclerophyll forest and subtropical rainforest species will establish under local climatic conditions, subject to seasonal variability, and that appropriate site preparation, planting density, infill and ongoing maintenance will support the development of a structurally diverse vegetation community over the 25-year monitoring period. The restoration approach recognises the mixed ecological character of the target system, including rainforest and wet sclerophyll forest canopy elements with a developing mesic understorey.

Key limitations include potential impacts from drought, flooding, bushfire, pest species, and future changes in land management practices or regulatory requirements. The project also assumes continued access to locally sourced seed and planting stock representative of the relevant rainforest and wet sclerophyll forest plant community types.

Adaptive management will be applied throughout the project to respond to environmental variability and establishment outcomes. This includes planned, staged infill planting to strengthen understorey, vine and ground layer representation in accordance with the restoration target, while remaining within the ecological planting constraints of the ACCU Scheme. Given the presence of adjacent remnant vegetation, the project anticipates a contribution from natural regeneration to enhance species diversity and structural complexity over time. This process will be supported through site management practices that facilitate recruitment and persistence of native species.

2. Indigenous Engagement

Indigenous engagement

The project proponent notified the Tweed River Bundjalung People's legal representative (Apix Law Group) of the proposed rainforest and wet sclerophyll forest restoration project and invited feedback regarding the design and implementation of the project. Correspondence notifying the

claimant group was issued on 19 November 2025 in relation to the ACCU project, and confirmation of receipt was provided by the claimant's legal representatives on 21 November 2025.

Additional engagement was sought on 23 April 2026 to engage in species selection and project design, specifically in relation to the Nature Repair Market registration. Acknowledgement of contact was made by the Tweed River Bundjalung People's legal representative on 23 April 2026.

3. Project outcome

The biodiversity outcome of this project is to enhance or protect biodiversity in native species by replanting native forest and woodland ecosystems in the project area on historically cleared land in modified landscapes. The project will improve the extent and condition of native vegetation and support ecological connectivity within the project area.

How the project outcome is intended to be achieved

The project aims to achieve the biodiversity outcome by meeting the nominated restoration targets for each ecosystem condition indicator within the 25-year project period. This will be achieved through a combination of environmental plantings, site preparation and adaptive land management practices designed to progressively improve the ecological condition of the activity areas.

The project outcome will be achieved through the following activities:

Establishment of native vegetation

- Native vegetation will be established using mixed-species environmental plantings designed to replicate the structure and species composition of the regional reference ecosystem.
- Species will be selected from plant communities occurring in the surrounding landscape, including remnant rainforest and wet sclerophyll forest within Nightcap National Park.
- Plantings will include species from the canopy, mid-storey and understorey strata to support the development of a multi-layered forest structure over time. Species that are sensitive to direct sun or exposed conditions will be incorporated through planned, staged infill planting as canopy cover develops, improving establishment success and facilitating progression toward the target vegetation structure.
- This planting design supports ecosystem condition indicators suitable to the restoration target including:
    - canopy height
    - canopy cover
    - mid-storey vegetation structure
    - ground cover
    - native species richness.
- Seedlings will be sourced from local or regional seed provenances where possible to maintain genetic integrity and support climate resilience.
- The planting program will introduce a diverse rainforest and wet sclerophyll forest community consisting of diverse locally occurring native species, supporting biodiversity restoration and long-term ecosystem stability. Further species, such as vines and understory, and threatened species will be introduced over time as the conditions are improved by the initial plantings. The total species richness after infill is expected to exceed 60 species towards the end of the 25-year project period.

Site preparation and planting

- Site preparation will be undertaken prior to planting to create suitable conditions for successful seedling establishment.
- Activities will include:
    - management of existing non-native vegetation
    - preparation of planting areas
    - installation of fencing to exclude livestock during the establishment phase.
- Planting and site preparation will be undertaken in a manner that:
    - improves water retention
    - reduces erosion
    - supports seedling establishment.
- Restoration activities will be sensitive to existing hydrological features, including creeks, riparian zones and drainage lines.

Management of key risks

The project proponent has identified several risks that could affect restoration outcomes and will actively manage these throughout the project period.

Key risks include:

- bushfire events
- drought conditions
- flooding in riparian zones
- disturbance from livestock or feral animals.

Management measures include:

- coordinated fire management planning with neighbouring landholders and the NSW Rural Fire Service
- maintenance of fire access tracks and fuel load management through surrounding grazing practices
- installation and maintenance of fencing to exclude livestock from planted areas
- drought mitigation measures during early seedling establishment
- regular monitoring and property inspections to identify and manage emerging risks.

These measures form part of the long-term project risk management framework established for the restoration project.

Hydrological and landscape management

- Restoration activities will be implemented in a way that protects and improves the condition of hydrological features within the project area.
- Plantings will occur in areas including **riparian zones and gullies**, where soil moisture conditions support vegetation establishment.
- Flood resilience measures have been implemented within creek via high density plantings (> 2500 stems/ha) systems to:
    - slow peak water flows
    - reduce erosion
    - improve long-term stability of the landscape.

Monitoring and adaptive management

- Monitoring will be undertaken throughout the project period to assess progress toward the nominated ecosystem condition indicators and restoration targets.
- Monitoring outcomes will inform **adaptive management**, allowing the project proponent to:
    - address emerging risks
    - respond to environmental variability
    - ensure vegetation condition improves over time.
- Long-term management practices supporting restoration success include:
    - maintenance of fencing and grazing controls
    - regular property inspections
    - maintenance of fire management infrastructure.

Project capability and experience

- The project proponent and landholder have experience managing agricultural land and implementing rainforest and similar restoration activities in the Northern Rivers region.
- The project also benefits from collaboration with experienced planting contractors and ongoing engagement with local landholders and fire management authorities.

Restoration targets for the ecosystem condition

Table 1: Restoration target levels for each activity area

Activity area ID	Starting condition state	Target Level
AA1	Starting State C (STM 14)	2
AA2	Starting State C (STM 14)	3

4. Permanent sampling plots

This section provides the permanent sampling plot details and Figure 1 provides a visual of the location of the permanent sampling plots and the location of the respective centre lines.

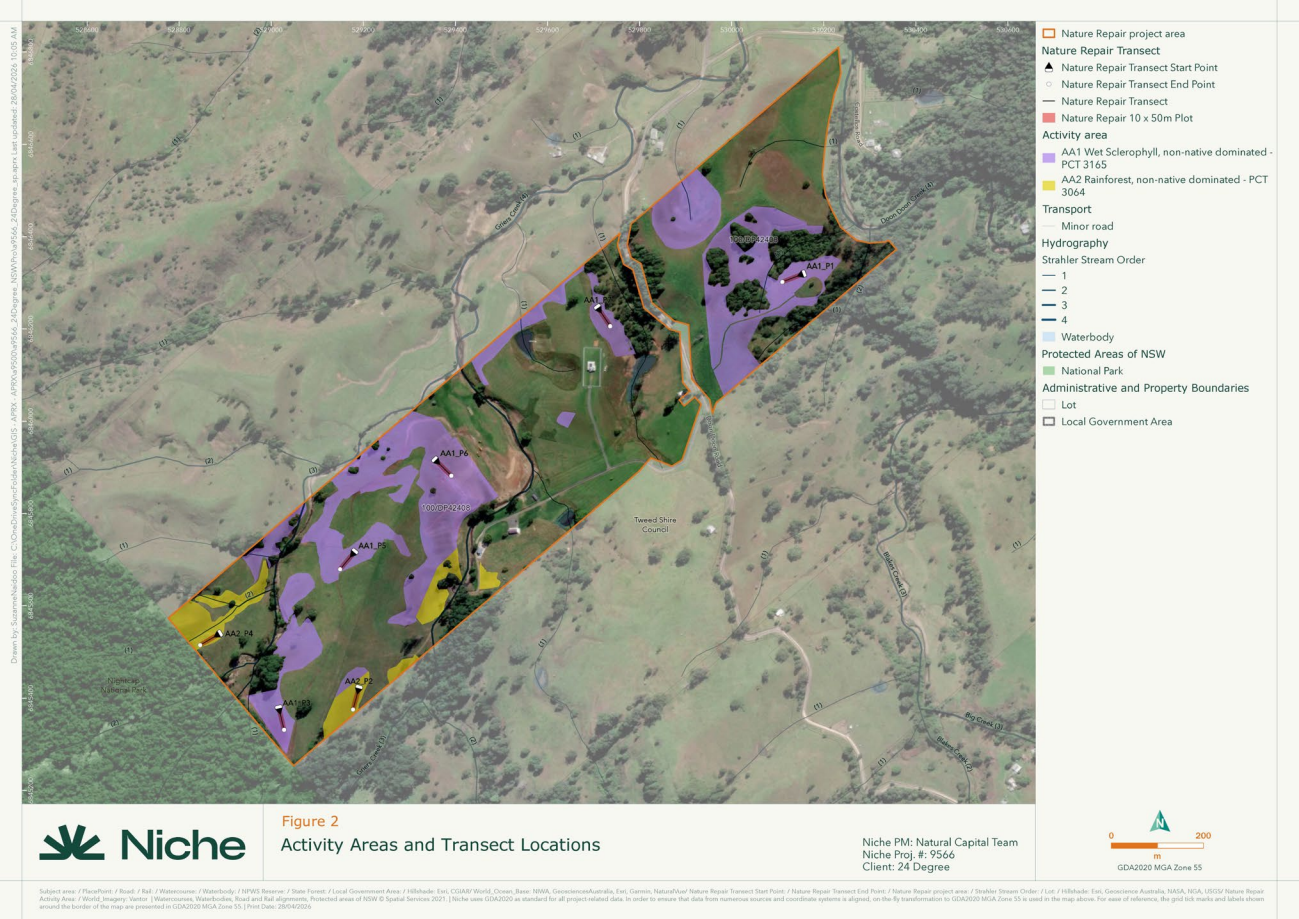

Figure 1: Map of Activity Areas and Sampling Plot Locations

Table 2: Permanent sampling plots for the activity area

Activity area ID	Sampling plot ID	Location of permanent markers of the plots (Centreline joins markers)	Representativeness
AA1	AA1_P1_start	Start: 530156.7137, 6846319.6921 End: 530110.1515, 6846301.5257	Sampling plot is representative of at least 90% of the activity area in which they are located, in terms of composition and condition, at the time of monitoring.
AA1	AA2_P2_start	Start: 529190.6169, 6845423.4277 End: 529177.5076, 6845375.197	
AA1	AA1_P3_start	Start: 529016.0269, 6845379.8849 End: 529027.91, 6845331.3376	
AA1	AA2_P4_start	Start: 528888.4862, 6845540.1244 End: 528845.4932, 6845514.6362	
AA1	AA1_P5_start	Start: 529181.3449, 6845717.7404 End: 529149.6966, 6845679.0566	
AA2	AA1_P6_start	Start: 529355.5392, 6845916.909 End: 529391.0752, 6845881.7629	
AA2	AA1_P7_start	Start: 529708.4503, 6846247.1926 End: 529736.1611, 6846205.5973	

5. Reference ecosystems

Table 3: Description of reference ecosystem for each activity area

Activity area or sub- area ID	Description of reference ecosystem
AA1	**Reference Ecosystem:** PCT 3165 - Northern Brush Box Subtropical Wet Forest **IUCN GET:** T2.5Temperate pyric humid forests **NVIS:** MVG 2 (Eucalypt tall open forests), MVS 3 (Eucalyptus (+/- tall) open forest with a dense broad-leaved and/or tree-fern understorey (wet sclerophyll)) **PCT 3165 - Northern Brush Box Subtropical Wet Forest:** Eucalyptus (+/- tall) open forest with a dense broad-leaved and/or tree-fern understorey (wet sclerophyll). Very tall to extremely tall, sclerophyll open to closed forest with mid-dense to dense mesic small tree layer, or rarely rainforest with eucalypt emergents. The canopy commonly includes *Lophostemon confertus*, accompanied by *Eucalyptus grandis* and rarely *Eucalyptus microcorys* and *Syncarpia glomulifera*. *Archontophoenix cunninghamiana* is very frequent. The mid-stratum very frequently includes trees *Wilkiea huegeliana, Sarcopteryx stipata* and *Cryptocarya glaucescens, vines Gynochthodes jasminoides* and *Cissus hypoglauca* and the tree fern *Cyathea leichhardtiana*. The ground layer very frequently includes the fern *Blechnum cartilagineum*. This PCT occurs on sheltered or lower slopes or in gullies, in moderately warm, very wet locations receiving 1480-1890 mm mean annual rainfall.
AA2	**Reference Ecosystem:** PCT 3064 - Far North Hoop Pine Dry Rainforest **IUCN GET:** T1.1 Tropical/Subtropical lowland rainforests **NVIS:** MVG 1 (Rainforests and vine thickets), MVS 62 (Dry rainforest or vine thickets) **PCT 3064 - Far North Hoop Pine Dry Rainforest:** A mid-high to very tall, rarely extremely tall, mid-dense to dense rainforest, which occurs mainly on the lower slopes of the Tweed Range. *Araucaria cunninghamii* is very frequently present as a very tall to extremely tall canopy tree or emergent and commonly has a high foliage cover. Other tree species almost always present include *Arytera distylis, Scolopia braunii, Mallotus philippinensis* and *Cryptocarya triplinervis*, and commonly *Argyrodendron trifoliolatum*. The climbing palm Calamus muelleri and vine *Uvaria leichhardtii* are almost always present. This PCT occurs on basalt and fertile, clay-rich sedimentary slopes below the basalt escarpment of the Tweed Range. It occurs mainly in warm, very wet locations receiving 1520-1710 mm mean annual rainfall.

6. Starting ecosystem condition

Table 4: Starting state and ecosystem condition details for each activity area

Activity area ID	Ecosystem condition state	No. of A1, A2 and A3 plant species	Ground cover provided A1, A2 and A3 plant species	No. of regenerated native plant species*	Cover provided by non-native species**
AA1	State C	A1- 7 A2- 7 A3- 0	A1 – 3.82% A2 – 1.72% A3 - 0%	13	94.46%
AA2	State C	A1- 1 A2- 4 A3- 0	A1 – 0.65% A2 – 0.6% A3 - 0%	0	98.75%

** the cover provided by non-native plant species in the activity, by life form such as trees, shrubs, vines and grass.

7. Starting values for ecosystem condition indicators

Table 5: Starting values of each indicator for its ecosystem condition for the activity area.

Indicators/sub-indicators	Starting value	
	AA1	**AA2**
canopy height of native vegetation (in metres)	0	0
crown cover from native plants in the canopy layer (as a percentage)	0	0
crown cover from native plants in the mid-storey layer (as a percentage)	0	0
crown cover from plants in the canopy layer provided by non-native plants (as a percentage)	0	0
crown cover from plants in the mid-storey layer provided by non-native plants (as a percentage)	0	0
ground cover from sub-category A1, A2 and A3 plants as a proportion of total ground cover from category A plants	5.54%	1.25%
ground cover from sub-category A4 and A5 plants as a proportion of total ground cover from category A plants	94.46%	98.75%
native species richness index by life form (sub-indicators) (native tree, shrub, vine, grass and herbaceous vascular plant species other than grasses)	2.8	2.5

8. Benchmark values for ecosystem condition indicators

Table 6: Benchmark values for each indicator and sub-indicator for the activity area.

Activity Area ID: AA1 Benchmarks for North Coast Wet Sclerophyll Forests in NSW North Coast IBRA	
Indicators	**Benchmark values**
	PCT 3165
Canopy height of native vegetation (in metres)	35.0m
Crown cover from native plants in the canopy layer (as a percentage)	55%
Crown cover from native plants in the mid-storey layer (as a percentage)	52.5%
Crown cover from plants in the canopy layer provided by non-native plants (as a percentage)	0%
Crown cover from plants in the mid-storey layer provided by non-native plants (as a percentage)	0%
Ground cover from sub-category A1, A2 and A3 plants as a proportion of total ground cover from category A plants	100%
Ground cover from sub-category A4 and A5 plants as a proportion of total ground cover from category A plants	0%
Native species richness index by life form (sub-indicator)	
Native tree	13
Shrub	14
Vine (incorporated in 'other' species under BAM benchmarking)	10
Grass (and grass like)	5
Herbaceous vascular plant species other than grasses	15
Total species richness	57

Table 7: Benchmark values for each indicator and sub-indicator for the activity area.

Activity area ID: AA2 Benchmarks for Dry Rainforests in NSW North Coast IBRA	
Indicators	**Benchmark values**
	PCT 3064
Canopy height of native vegetation (in metres)	20.5m
Crown cover from native plants in the canopy layer (as a percentage)	60%
Crown cover from native plants in the mid-storey layer (as a percentage)	40%
Crown cover from plants in the canopy layer provided by non-native plants (as a percentage)	0%
Crown cover from plants in the mid-storey layer provided by non-native plants (as a percentage)	0%
Ground cover from sub-category A1, A2 and A3 plants as a proportion of total ground cover from category A plants	100%
Ground cover from sub-category A4 and A5 plants as a proportion of total ground cover from category A plants	0%
Native species richness index by life form (sub-indicator)	
Native tree	11
Shrub	12
Vine	9
Grass	4
herbaceous vascular plant species other than grasses	11
Total species richness	46

9. Threshold values for ecosystem condition indicators

Table 8: Threshold values for each indicator and sub-indicator for the activity area.

Indicator	Threshold value	
	AA1 Target level 2	**AA2 Target level 3**
canopy height of native vegetation (in metres)	5m	5m
crown cover from native plants in the canopy layer (as a percentage)	18.3%	20%
crown cover from native plants in the mid-storey layer (as a percentage)	17.5%	13.3%
crown cover from plants in the canopy layer provided by non-native plants (as a percentage)	No more than 10%	No more than 7.5%
crown cover from plants in the mid-storey layer provided by non-native plants (as a percentage)	No more than 10%	No more than 7.5%
ground cover from sub-category A1, A2 and A3 plants as a proportion of total ground cover from category A plants	6.9%	1.9%
ground cover from sub-category A4 and A5 plants as a proportion of total ground cover from category A plants	No more than 70.8%	No more than 49.4%
native species richness index by life form (native tree, shrub, vine, grass and herbaceous vascular plant species other than grasses)	14.25	27.6

10. Proposed plantings

The Doon Doon planting species list was developed by the project proponent in collaboration with their restoration partner based on detailed on-ground assessment of species occurring within the project area and immediately adjacent landscapes, including Nightcap National Park. Given the relatively small geographic footprint of the property, local species composition is highly representative of the surrounding ecological communities. In addition, the species selection was cross-referenced against the pre-1750 vegetation layer from SEED NSW to confirm alignment with the Plant Community Types (PCTs) historically mapped across the site. The species selection was undertaken prior to the formal ecological assessment and confirmation of PCT mapping (ecologist-confirmed PCTs as part of the Starting State Assessment surveys) for Nature Repair Market registration, in order to meet practical project delivery requirements, including the procurement of approximately 40,000 tube stock for planting from late March 2026. As such, the species list was informed by site-based observations, regional ecological knowledge, and cross-referenced against pre-1750 PCT SEED NSW mapping across all PCTs across the property to ensure suitability to local conditions.

The selected species demonstrate a high degree of alignment with the six PCTs from SEED NSW across the property (3011, 3064, 3165, 3139, 3172, 3148), with the majority of species occurring across multiple PCTs and many present in all six demonstrating a high degree of cross-PCT

representativeness and ecological suitability across the project area. The species assemblage strongly reflects the dominant validated PCTs (3165 and 3064), while also incorporating species characteristic of the broader PCT mosaic present on site. Importantly, all selected species are known to occur within at least one of the SEED NSW PCTs, and no non-characteristic species have been introduced. Given the substantial floristic overlap and structural similarity between these PCTs, exact one-to-one replication of individual PCT benchmark species lists at a fine spatial scale is neither ecologically necessary nor operationally practical. Instead, species will be preferentially allocated to activity areas to reflect the confirmed (ecologist-validated) PCT distribution as far as practicable, noting that the species list has been reviewed against the confirmed PCT mapping and is appropriate given the high degree of floristic overlap between PCTs. This approach is consistent with restoration ecology principles and supports the achievement of target condition outcomes under the Nature Repair Method. Infill planting will be used to further strengthen alignment with ecologists-confirmed PCT characteristics.

In addition, the species selection has been designed to promote long-term ecosystem resilience, including the development of rainforest and wet sclerophyll forest characteristics that contribute to reduced fire risk through maintenance of a moist, shaded microclimate. The inclusion of species with known capacity to support closed-canopy formation and suppress flammable understorey aligns with the project's objective of establishing self-sustaining, climate-resilient vegetation communities. This functional approach complements the compositional alignment with mapped PCTs and strengthens the overall ecological integrity and durability of the restoration outcome.

Table 9: Details of the proposed planting schedule and method for the activity area.

Activity area ID:	AA1
Species (common name (*Scientific name*))	**28 Species:** Sally Wattle (Acacia melanoxylon), Red Ash (Alphitonia excelsa), Flame Tree (Brachychiton acerifolius), Brown Kurrajong (Commersonia bartramia), Small Leave fig (Ficus obliqua), Teak (Flindersia australis), Cudgerie (Flindersia schottiana), Cheese Tree (Glochidion ferdinandi), Silky Oak (Grevillea robusta), Brush Box (Lophostemon confertus), Firewheel Tree (Stenocarpus sinuatus), Riberry (Syzygium luehmannii), Red Cedar (Toona ciliata), Bleeding Heart (Homalanthus populifolius), Native Frangipani (Hymenosporum flavum), Sweet Pittosporum (Pittosporum undulatum), White Ash (Alphitonia petriei), White Fig (Ficus virens var. sublanceolata), Yellowwood (Flindersia xanthoxyla), Swamp Mahagony (Lophostemon suaveolens), Macaranga (Macaranga tanarius), Plum Pine (Podocarpus elatus), Hoop Pine (Araucaria cunninghamii), Red Kamala (Mallotus philippensis), Black Bean (Castanospermum australe), Foambark Tree (Jagera pseudorhus var. pseudorhus), Koda (Ehretia acuminata var. acuminata), Blue Quandong (Elaeocarpus grandis)
Target density (stems per ha)	2500 stems per ha

Site preparation	• GPS confirmation/tracking of activity areas • Aerial drone spraying of activity areas with label dosage of NuFarm Crucial 600. • Mulching of activity areas (given steep terrain using a combination of tractor, excavator and remote controlled forestry mulching equipment). The equipment is set at an appropriate height to avoid soil disruption. Weather conditions are monitored closely to minimise soil disruption from machinery working on wet soil as far as possible.
Planting method	Planting tube stock, using a team of 10 to 12 people with handheld augers. This project does not use tractor or mechanical ripping.

Activity area ID:	AA2
Species (common name (*Scientific name*))	**24 Species:** Sally Wattle (Acacia melanoxylon), Red Ash (Alphitonia excelsa), Flame Tree (Brachychiton acerifolius), Brown Kurrajong (Commersonia bartramia), Small Leave fig (Ficus obliqua), Teak (Flindersia australis), Cudgerie (Flindersia schottiana), Cheese Tree (Glochidion ferdinandi), Silky Oak (Grevillea robusta), Brush Box (Lophostemon confertus), Firewheel Tree (Stenocarpus sinuatus), Riberry (Syzygium luehmannii), Red Cedar (Toona ciliata), Bleeding Heart (Homalanthus populifolius), Native Frangipani (Hymenosporum flavum), Sweet Pittosporum (Pittosporum undulatum), Hoop Pine (Araucaria cunninghamii), Red Kamala (Mallotus philippensis), Foambark Tree (Jagera pseudorhus var. pseudorhus), Koda (Ehretia acuminata var. acuminata), White Cedar (Melia azedarach), Common Acronychia (Acronychia oblongifolia), Hairy Pittosporum (Pittosporum revolutum), Strangler Fig (Ficus watkinsiana).
Target density (stems per ha)	2500 stems per ha
Site preparation	• GPS confirmation/tracking of activity areas • Aerial drone spraying of activity areas with label dosage of NuFarm Crucial 600. • Mulching of activity areas (given steep terrain using a combination of tractor, excavator and remote controlled forestry mulching equipment). The equipment is set at an appropriate height to avoid soil disruption. Weather conditions are monitored closely to minimise soil disruption from machinery working on wet soil as far as possible.

Planting method	Planting tube stock, using a team of 10 to 12 people with handheld augers. This project does not use tractor or mechanical ripping.

Staggered plantings

Staggered and infill plantings form a planned component of the restoration approach by the project proponent, enabling the progressive development of vegetation structure and species diversity. Initial plantings focus on establishing canopy and mid-stratum species to provide early site stabilisation and shade. Subsequent infill plantings will introduce additional understorey, vine and ground-layer species as site conditions become more suitable for their establishment.

The tables below set out the indicative timing and species composition of staggered and infill plantings. Species selection may vary depending on seasonal conditions, plant availability, establishment outcomes and other project factors, while remaining as aligned as possible with the target plant community types and restoration objectives.

Table 10: Staggered plantings within each activity area.

Activity area ID	Details
AA1	Approximately 7 to 10 years after the initial planting, selective infill of the following species will occur to enrich the biodiversity and more closely reflect the reference ecosystem. Some earlier infill planting may occur as required. Syncarpia glomulifera, Archontophoenix cunninghamiana, Wilkiea huegeliana, Sarcopteryx stipata and Cryptocarya glaucescens, Gynochthodes jasminoides and Cissus hypoglauca, Cyathea leichhardtiana, Blechnum cartilagineum, Cissus hypoglauca, Geitonoplesium cymosum, Pandorea pandorana, Smilax australis, Oplismenus aemulus, Entolasia stricta, Lomandra longifolia, Commelina cyanea, Dianella caerulea, Viola hederacea, Pseuderanthemum variabile, Elatostema reticulatum.
AA2	Approximately 7 to 10 years after the initial planting, selective infill of the following species will occur to enrich the biodiversity and more closely reflect the reference ecosystem. Some earlier infill planting may occur as required. Archontophoenix cunninghamiana, Arytera distylis, Scolopia braunii, Mallotus philippinensis, Cryptocarya triplinervis, Calamus muelleri, Uvaria leichhardtii, Cissus antarctica, Cissus hypoglauca, Geitonoplesium cymosum, Pandorea pandorana, Smilax australis, Oplismenus aemulus, Oplismenus imbecillis, Microlaena stipoides, Lomandra longifolia, Commelina cyanea, Dianella caerulea, Dianella tasmanica, Viola hederacea, Pseuderanthemum variabile, Aneilema acuminatum, Pollia crispata, Elatostema reticulatum

11. Natural regeneration

Please refer the Natural Regeneration section of the Site Assessment Report.

Table 11: Natural regeneration relied on within each activity area.

Activity area ID	Species names, location and number of species	Evidence that natural regeneration will not be damaged in the implementation of the proposed plantings
AA1	Natural regeneration was rare and limited to scattered individuals of species and seedlings of Acacia *maidenii*, *Toona siliata*, *Acacia concurrens* and Lophostemon *confertus*. No area of native regeneration for these species was removed from the activity area as it did not meet the stems per 10mx10m threshold. A cluster of soil seeded Acacia concurrens and Lophostemon confertus all with stems over 5cm and over 2 years old were located in an area of AA1 between the house and the main road. This area of native regeneration was mapped and removed as it met the stems per 10mx10m threshold.	Weed control has been, and will continue to be, undertaken using manual methods or targeted spot spraying to avoid impacts on existing native regeneration. Site preparation and planting activities will be carried out selectively and manually in proximity to natural regeneration to ensure that established individuals are not damaged during project implementation.

12. Other features

Culturally sensitive areas

The project proponent confirmed there was no culturally sensitive areas on the property at the time of registration.

Significant hydrological features

See the Significant Hydrological Features section of the site assessment report for details of the significant hydrological features.

Threatened species and ecological communities

Please refer the Threatened species and ecological communities section of the Site Assessment Report for further information. In summary, two critically endangered species or ecological communities were identified (refer Table 12 below.

Measures to promote or conserve the recovery of threatened species and ecological communities:

The project will focus on restoring native vegetation consistent with the structure and species composition of the Lowland Rainforest of Subtropical Australia ecological community within Activity Area AA2 where alignment with this Critically Endangered community has been observed. Restoration activities are set to achieve restoration target level 3 under the relevant NRM method and will prioritise the use of locally indigenous species, with planting design informed by adjacent ecosystems such as Nightcap National Park. By establishing this vegetation,

the project effectively extends the ecological footprint and buffering of the Gondwana Rainforests of Australia World Heritage Area, enhancing the long-term resilience of these remnants and protecting them against edge effects.

Specific measures will also support the recovery of Scrub Turpentine (Rhodamnia rubescens), which has been recorded within proximity to the Activity Areas. This will include avoiding disturbance during project activities and its incorporation into revegetation where appropriate and feasible. As R. rubescens is extremely susceptible to Myrtle Rust (Austropuccinia psidii), which causes severe crown dieback and is projected to lead to a 96–99% population decline over three generations (NSW TSSC 2019; Carnegie et al. 2016), the project will focus on identifying, monitoring, and protecting healthy individuals as potential sources of resistant provenance for research and recovery where feasible.

Key management actions include intensive weed control and the permanent exclusion of grazing to facilitate natural regeneration from rich remnant ecological communities in the adjacent Nightcap National Park.

The project will enhance habitat connectivity by linking existing remnants and regrowth with activity areas, from Nightcap National Park on the west through to the east of the project area, providing interlocking connectivity where possible. This high-value project delivers rich structural complexity across the site, creating vital habitat and "stepping stones" for threatened fauna identified within the Site Assessment Report, as per the EPBC Act Protected Matters Search Tool.

Table 12: Threatened species and ecological communities by activity area.

Activity area ID	Description
AA2	Was observed to align with the **Critically Endangered** ecological community Lowland Rainforest of Subtropical Australia.
All Activity Areas	Scrub Turpentine (Rhodamnia rubescens) was recorded on site in two locations within 50m of Activity Areas and is listed as **Critically Endangered** under the EBPC Act.

14. Management Activities

Management history and historic drivers

Please refer the History of Clearing and Historic Drivers of change sections of the Site Assessment Report.

Threats to the activity area

Please refer the Threats to the Project Area section of the Site Assessment Report.

Managing threats to the project outcome

Several risks have been identified by the project proponent that could affect the successful establishment and long-term persistence of native vegetation within the project area.

Management activities will be implemented to minimise these risks and ensure restoration targets can be achieved.

Weed and invasive species management

- Regular inspections will be undertaken to identify invasive plant species within the activity areas and surrounding buffer zones.
- Where invasive species are detected, appropriate control measures will be implemented, including manual removal, targeted herbicide application, or other permitted control methods.
- Weed management will prioritise early detection and rapid response to prevent invasive species from establishing dominance over native vegetation.
- Weed management and maintenance will be undertaken in a way that does not harm any of the plantings in the project areas and compliance will be monitored regularly.

Bushfire risk management

Bushfire risk will be managed through a combination of property-level mitigation measures and coordination with neighbouring landholders and local fire authorities.

Management measures include:

- maintaining access tracks and fire trails to enable emergency access
- monitoring fuel loads in surrounding areas and managing grass fuels through grazing where appropriate
- maintaining water storage infrastructure and equipment that can assist with emergency response
- ongoing engagement with neighbouring landholders and the NSW Rural Fire Service to support coordinated fire response planning.

Where fire management activities such as fuel reduction or hazard reduction burns are undertaken, they will be conducted in accordance with section 14 of the method and applicable fire management regulations. These activities will be designed to maintain or improve the condition of the replanting areas and avoid damage to established vegetation.

Drought management

Drought conditions may affect seedling survival during the early establishment period.

To mitigate this risk:

- species selected for planting include native rainforest and wet sclerophyll forest species adapted to local climatic conditions
- soil moisture retention will be supported through mulching and appropriate site preparation
- water-retention products such as soil moisture crystals and initial watering will be used at planting
- emergency watering may be undertaken during extended dry periods where necessary.

These measures are designed to support seedling establishment and improve survival during early growth stages.

Flooding and hydrological risks

Some plantings will occur within riparian areas where temporary flooding may occur during peak rainfall events.

Management measures include:

- planting species suited to riparian environments
- planting high density (>2,500 stems/ha)
- maintaining natural drainage patterns to prevent waterlogging
- implementing erosion control and flood resilience measures within creek systems.

These measures are intended to reduce erosion, improve water quality and minimise vegetation loss during high rainfall events.

Grazing and livestock management

Livestock access to the planted areas may damage establishing vegetation.

To manage this risk:

- temporary fencing will be installed around planting areas during the establishment phase and beyond
- livestock movements will be monitored during routine property inspections. At the time of writing inspections occur 4 times per week.
- any breaches of livestock into planting areas will be rectified promptly.

These measures will ensure grazing pressure does not compromise vegetation establishment.

Management Duration of the permanence period

The project proponent will implement adaptive management practices throughout the permanence period to ensure that the restored vegetation continues to develop toward the reference ecosystem condition and that the project outcome is maintained.

Key management activities will include:

Ongoing monitoring and adaptive management

- periodic monitoring of vegetation condition to assess progress toward ecosystem condition indicators
- monitoring of canopy development, vegetation structure and native species richness
- review of monitoring results to inform adaptive management decisions where necessary.

Monitoring may be undertaken using field inspections and, where appropriate, aerial or remote sensing imagery.

Long-term weed and pest management

- ongoing management of invasive plant species to prevent competition with native vegetation
- management of browsing pressure from feral animals where necessary
- use of targeted control measures that minimise disturbance to native vegetation.

Fire management

- maintenance of fire access tracks and water infrastructure
- management of surrounding grass fuel loads where appropriate
- continued engagement with neighbouring landholders and local fire authorities.

Where fire-related activities such as hazard reduction burns are undertaken, they will be implemented in accordance with section 14 of the method, ensuring that these activities maintain or improve the ecological condition of the replanting areas. Given the ecological communities being planted are highly sensitive to fire, there are no planned burning in activity areas, indefinitely.

Grazing management

- grazing will be managed in surrounding agricultural areas to maintain appropriate fuel loads and reduce fire risk. The project design is specifically tailored to allow grazing directly adjacent to the activity areas.
- livestock will be excluded from restoration areas during establishment and managed appropriately thereafter to avoid damage to vegetation.

Infrastructure and access management

- maintenance of fencing, access tracks and water infrastructure
- continued property inspections to ensure risks to vegetation establishment are identified and addressed early.

Review and continuous improvement

- the project proponent will maintain a project risk management framework that identifies potential risks to vegetation permanence
- management practices will be periodically reviewed and updated to ensure the project continues to meet restoration targets and biodiversity outcomes.

15. Climate change considerations

Please refer to the Climate Change section of the Site Assessment Report. Additionally, the project proponent recognises that climate change may influence vegetation establishment and ecosystem recovery through increased temperatures, altered rainfall patterns, drought intensity and potential changes to fire behaviour. The project has therefore been designed to maximise the resilience of the restored rainforest and wet sclerophyll forest ecosystem under future climatic conditions.

Establishment of canopy

The primary strategy for improving ecosystem resilience is the establishment of canopy structure through dense mixed-species environmental plantings. Achieving canopy closure as quickly as possible creates the microclimatic conditions characteristic of target ecosystems and significantly improves the ability of vegetation to withstand climatic stress.

Scientific research demonstrates that forest canopy cover substantially moderates local temperatures relative to open landscapes. Global analyses indicate that forest understories are on average approximately 1.7 °C cooler than open conditions, with reductions in maximum

temperatures of approximately 4.1 °C and slightly higher minimum temperatures, resulting in reduced temperature variability (De Frenne et al., 2019). The cooling of mean and maximum temperatures is strongest in tropical forests (De Frenne et al., 2019, p. 745), indicating that buffering in subtropical systems is likely toward the upper range of observed values.

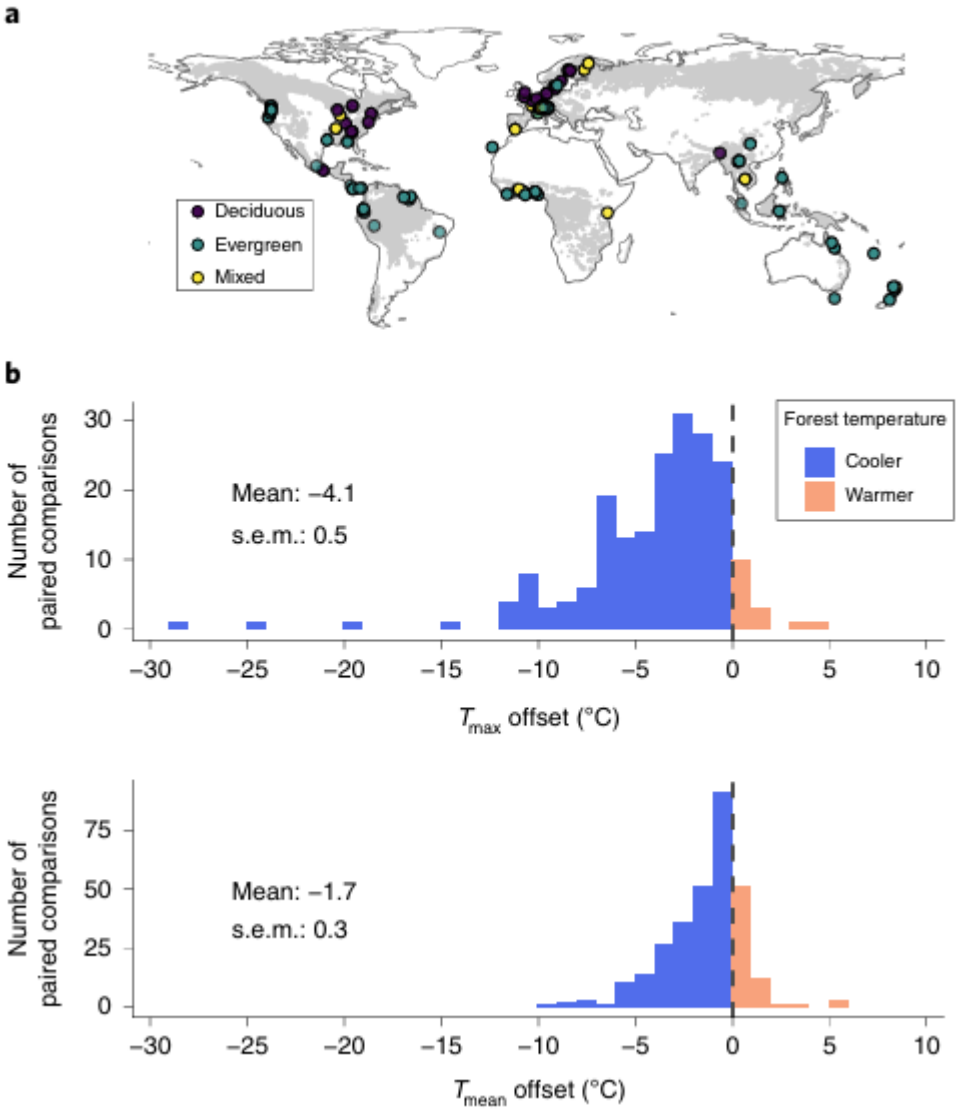

Figure 2: Forests buffer temperatures under canopies globally. a, Distribution of the 98 study sites and their vegetation types. b, Histograms display the 714 paired temperature offset values for maximum (Tmax) and mean (Tmean) (Source: De Frenne et al. (2019)

Research from temperate Australia shows that forest structure strongly influences microclimate buffering. Compared with open sites, closed forests with >70% canopy cover reduced mean daily maximum temperature by 1.8 to 4.1°C, whereas open forests with 30–70% canopy cover reduced mean daily maximum temperature by only 0.2 to 0.4°C. Buffering increased with canopy closure, leaf area index and stem density, indicating that dense, closed-canopy systems provide substantially greater temperature moderation than more open forest structures (Mwamulima et al., 2025).

Figure 1 illustrates the distribution of temperature offsets across study sites, demonstrating variability around the mean and indicating that stronger buffering effects can occur under specific environmental and structural conditions. Further research is required to understand the

specific environmental and structural conditions associated with the highest observed buffering effects, including whether tropical and subtropical systems consistently outperform other forest types.

These findings highlight that forests act as a thermal buffer relative to open environments, resulting in lower rates of warming within forest understories compared to surrounding non-forested areas. The magnitude of this buffering can exceed the scale of global average warming observed over the past century, demonstrating the important role of forest canopy in moderating local climate conditions (De Frenne et al., 2019, p. 745).

During extreme heat events, this buffering effect becomes more pronounced. For example, during the 2021 Pacific Northwest heat dome, forest understories were approximately 3 °C cooler than adjacent clear-cut areas and up to 4 °C cooler than regional temperatures (John et al., 2024).

Forest canopy also increases relative humidity and reduces wind exposure, which improves soil moisture retention and reduces evaporative drying. Forest microclimates therefore buffer organisms from temperature extremes and reduce water stress compared with open landscapes (De Frenne et al., 2021).

These studies demonstrate that establishing dense forest canopy is one of the most effective mechanisms for reducing local temperature extremes and maintaining soil and fuel moisture, which are key determinants of drought resilience and wildfire behaviour.

In contrast, open pasture or sparsely wooded landscapes provide little microclimate buffering, leading to higher surface temperatures, lower humidity and faster drying of fuels. These conditions significantly increase wildfire risk and reduce ecological resilience.

Implications for fire risk

Rainforest ecosystems typically exhibit lower wildfire susceptibility than open landscapes or eucalypt woodland because canopy structure maintains higher fuel moisture and suppresses flammable grasses.

Dense rainforest canopy:

- reduces solar radiation reaching the ground
- maintains higher humidity and soil moisture
- suppresses growth of flammable grass fuels
- limits wind penetration within the vegetation.

Fuel moisture is widely recognised as one of the strongest constraints on wildfire ignition and spread. Live and dead fuel moisture content strongly influence vegetation flammability, including ignitability, combustibility and the ability of fire to propagate through vegetation fuels (Anderson 1970; Rossa & Fernandes 2018).

Rainforest ecosystems typically maintain higher fuel moisture than adjacent open vegetation types, which can significantly reduce wildfire spread. Research in south-eastern Australia has shown that high fuel moisture is a key factor explaining the resistance of rainforest vegetation to wildfire compared with surrounding forest types. This can limit wildfire spread and contribute to their persistence as fire refugia within fire-prone landscapes (Cawson et al. 2013; Bowman et al. 2014).

The Bowman et al. (2014) study highlights that maintaining long fire-free periods is critical for the persistence of these forest ecosystems and that altered fire regimes pose a major risk to their long-term stability. Increased fire frequency can cause transitions to more fire-tolerant vegetation types, resulting in the loss of mature forest ecosystems and associated biodiversity (Bowman et al., 2014).

For this reason, restoring dense rainforest canopy across previously cleared areas can contribute to lower fire risk and improved landscape resilience compared with maintaining open pasture or sparse woodland conditions.

There is strong evidence that increased fire frequency and intensity can drive transitions from closed, mesic forest systems toward more open, fire-tolerant vegetation states. In eastern Australia, this process has been associated with contraction of rainforest and expansion of more fire-prone vegetation under altered disturbance regimes.

Within wet sclerophyll–rainforest mosaics, these dynamics can result in a shift away from closed-canopy forest structure where fire frequency exceeds ecological thresholds. This represents a key risk to long-term ecosystem resilience, particularly under projected climate change scenarios.

While rainforest ecosystems demonstrate resilience to low-intensity and infrequent fire, research indicates that increased fire frequency, severity and interaction with drought conditions can exceed recovery thresholds, leading to transition toward more fire-prone, fire-tolerant vegetation and reduced biodiversity (Bowman et al., 2014; Hoffmann et al., 2012; Queensland Fire and Biodiversity Consortium, 2023).

Loss of canopy cover following disturbance can create a positive feedback loop, whereby increased light penetration and drying promote the establishment of flammable grasses and fire-prone, fire-tolerant vegetation. This increases the likelihood and severity of subsequent fires and, where fire frequency is elevated, can result in a transition from rainforest to more fire-prone, fire-tolerant grassland or sclerophyll vegetation types (D'Antonio & Vitousek, 1992; Queensland Fire and Biodiversity Consortium, 2023).

Evidence from local regional rainforest restoration

Regional experience also supports the resilience of rainforest ecosystems once canopy structure has developed.

The Peter Finn Conservation Area at Afterlee near Kyogle, owned and managed by Don Durrant, provides a regional example of long-term rainforest restoration and conservation. The property protects areas of remnant and restored rainforest vegetation and supports habitat for multiple threatened species within the critically endangered Lowland Rainforest of Subtropical Australia ecological community.

According to the NSW Biodiversity Conservation Trust, observations at the site during recent drought conditions showed that although drought temporarily stressed vegetation, the rainforest ecosystem recovered following rainfall and regeneration processes continued (NSW Biodiversity Conservation Trust, 2023).

This regional example illustrates the capacity of established rainforest ecosystems in the Northern Rivers region to maintain ecological function and recover from climatic stress once canopy structure and ecological processes have developed.

Project design

Consistent with this evidence, the project will establish dense mixed-species plantings that include canopy, mid-storey and understorey species drawn from the regional reference ecosystem. The project's focus on rapid canopy closure is expected to place it toward the upper range of observed microclimate buffering effects.

The species selection drawn from within the reference ecosystem is expected to improve resilience to drought, heat and wildfire risk while supporting long-term biodiversity recovery within the landscape. The project's focus on species that support canopy closure and development of a structurally complex forest is expected to position it toward the upper range of observed microclimate buffering effects.

Early successional species such as *Acacia spp.* will be included to accelerate canopy establishment, stabilise soils and improve nitrogen availability during the early stages of restoration. The reference ecosystems contain many excellent pioneer species for this purpose. Rapid canopy development will assist with creating the microclimatic conditions associated with mature target ecosystems.

The project design aims to accelerate canopy closure and maintain continuous vegetation cover to minimise the period during which the site is vulnerable to repeated fire events (De Frenne et al., 2021; Queensland Fire and Biodiversity Consortium, 2023).

The highest climate-related risk occurs during the early establishment phase prior to canopy closure, when vegetation is more exposed to heat, drought and fire (De Frenne et al., 2021; Bowman et al., 2014; Queensland Fire and Biodiversity Consortium, 2023).

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17. Suitably Qualified Person(s)

By signing below, the suitably qualified person or persons declares:

- the information provided is true and not misleading and
- that the implementation of this project plan is likely achieve the project outcome and result in a biodiversity certificate being issued in respect of the project in accordance with section 36 of the method.

Full name of suitably qualified person	Dmitri Medvedko			
Contact details	info@niche-eh.com			
The suitably qualified person was responsible for	Preparing the project plan	☐	Certifying the project plan	☒
Relevant qualifications and experience	*See Appendix 1*			
Signature				
Signature date	*27/3/2026*			

Appendix 1: Relevant qualifications and experience of suitable qualified person

Dmitri Medvedko CV

BSc.

Senior Associate – Ecology and Natural Capital

- 10 years of experience in Australia and 3 years of experience in California as an environmental scientist and ecologist
- Strong knowledge of environmental legislation and development approval pathways in Queensland and New South Wales
- Accredited BAM Assessor (BAAS22009) under the *Biodiversity Conservation Act 2016* (NSW)
- Proficient in environmental construction management.

> "I seek to create positive interactions between the built and natural environment."

Career overview

Dmitri's career experience includes over ten years in ecological and environmental consulting. Dmitri has worked in numerous ecosystems, predominantly based in South East Queensland but extending as far north as Hervey Bay, as far south as Newcastle, and as far west as Broken Hill. Dmitri's experience includes a broad range of projects from linear infrastructure, large residential subdivisions and airport infrastructure to bespoke environmental management and habitat restoration. Dmitri is proficient in flora and fauna surveys, navigating environmental approvals and managing environmental aspects of construction.

Experience in most stages of a development on a diverse range of projects provided Dmitri with well-rounded skills in survey, data analysis, reporting and stakeholder liaison.

Skills

- BioCondition Assessment (QLD)
- Protected Plant Surveys (QLD)
- Applying the Biodiversity Assessment Method (NSW)
- Vegetation mapping (QLD and NSW)
- Targeted threatened species surveys (flora and fauna)

Flagship projects

APA Pty Ltd Bulloo Interlink Pipeline Biodiversity Approvals and Offsets Strategy (2025 – present)

Top Yarraman Partnership Pty Ltd Top Yarraman Biodiversity Stewardship Site Establishment (2024 – 2026)

Boral Resources Pty Ltd Johns River Quarry Extension Biodiversity Development Assessment Report (2024 – 2025)

Andres Property Group Bushland Drive, Taree Industrial Subdivision Biodiversity Development Assessment Report (2021 – 2022)

NSW Health Infrastructure Tweed Valley Hospital Habitat Restoration and Monitoring (2019 – 2023)

Pelican Waters Golf Pelican Waters Golf Environmental Management Plan (2022 – 2023)

SEE Civil Flagstone and Covella Residential Subdivisions (2019 – 2022)

Various clients Cobaki Residential Estate (2015 – 2023), Altitude Aspire Residential Subdivision (2015 – 2019), Fraser Cove Residential Subdivision (2015 – 2020), Hundred Hills Residential Subdivision (2015 - 2016), RivaVue Residential Subdivision (2016 – 2021), Tanglewood Emerald Mountain Residential Subdivision (2022 – 2023)

Employment history

- 2025 – present: Senior Associate, Niche Environment and Heritage
- 2023– 2025: Associate, Niche Environment and Heritage
- 2015 – 2023: Environmental Scientist, Boyds Bay Group
- 2014 – 2015: Environmental Compliance Coordinator, Seaport Refining
- 2012 – 2014: Ecologist, Sierra Nevada Research Institute