

HumeLink East



Biodiversity Management Sub-plan
HLE-AGJ-MGT-ALE-PLN-0000-00025 | Rev 02

I. APPROVALS

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The authorised use of this document shall only be once approved by way of presence of signatories under section above.

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02	15/09/2025	Nil		Issued for Use

GENERAL REQUIREMENTS

The Project Director is responsible for the distribution of this Management Plan. The controlled master version of this document is available for distribution as appropriate and maintained on RIB | CX. All circulated hard copies of this document are deemed to be uncontrolled. The implementation of this Management Plan is under the authority of AGJV and the Project Director. All personnel employed on the Project will perform their duties in accordance with the requirements of this Management Plan, supporting management plans, and related procedures.

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TERMS AND DEFINITIONS

Abbreviations	Definition
AGJV	Acciona Genus Joint Venture
AMM	Additional Mitigation Measures
BAM	Biodiversity Assessment Method 2020
BC Act	Biodiversity Conservation Act 2016
BCS	Biodiversity, Conservation and Science Directorate, now known as the Biodiversity and Conservation Division
BDAR	Biodiversity Development Assessment Report
BMP	Biodiversity Management Plan
BOS	Biodiversity Offset Strategy
CEEC	Critically Endangered Ecological Communities
CEMP	Construction Environmental Management Plan
CoA	Minister's Conditions of Approval
CSSI	The Critical State Significant Infrastructure, as described in Schedule 1, the carrying out of which is approved under the terms of the SSI-36656827 approval
Cth	Commonwealth
DAWE	Cth Department of Agriculture, Water and Environment, now known as Department of Climate Change, Energy, the Environment and Water
DECC	Former Department of Environment and Climate Change
DCCEEW	Department of Climate Change, Energy, the Environment and Water (Commonwealth) formerly known as the Biodiversity and Conservation Division of NSW Department of Planning and Environment
DPE	Department of Planning and Environment
DPHI	Department of Planning, Housing and Infrastructure, formerly known as the Planning Division of NSW Department of Planning and Environment
ECM	Environmental Control Map
EEC	Endangered Ecological Communities
EIS	Environmental Impact Statement
EPA	NSW Environment Protection Authority
EP&A Act	Environmental Planning and Assessment Act 1979
EPBC Act	Environmental Protection and Biodiversity Conservation Act 1999
EPL	Environment Protection Licence
EWMS	Environmental Work Method Statements
FCNSW	Forestry Corporation of NSW
FM Act	Fisheries Management Act 1994
GDE	Groundwater Dependent Ecosystem
GIS	Geographical Information System
GSM	Golden Sun Moth
Hold point	A verification point that prevents work from commencing prior to release from a specific criterion
IS	Infrastructure Sustainability
ISCA	Infrastructure Sustainability Council of Australia
KMGH	Key's Matchstick Grasshopper
LGA	Local government area
LLS	Local Land Services
Natural regeneration	Allowing or assisting the bush to grow back by itself (NSW Conservation Management Notes – Natural Regeneration (OEH, 2011))
NRAR	Natural Resources Access Regulator
NSW	New South Wales
NTG	Natural Temperate Grasslands

Abbreviations	Definition
PCT	Plant community type
Planning Secretary	Planning Secretary under the EP&A Act, or nominee
PMST	Protected Matters Search Tool
POEO Act	Protection of the Environment Operations Act 1997 (NSW)
Project, the	HumeLink East
Rehabilitation	The restoration of land disturbed by the development to a good condition, to ensure it is safe, stable and non-polluting (as per the Planning Approval)
Revegetation	Where planting or direct seeding is required for the purpose of regeneration (NSW Conservation Management Notes – Natural Regeneration (OEH, 2011))
Secretary	Secretary of the NSW Department of Climate Change, Energy, the Environment and Water or nominee, whether nominated before or after the date on which this approval was granted
SHNS	Supplementary Hollow and Nest Strategy
TEC	Threatened ecological community
UMM	Updated Mitigation Measures
WoNS	Weeds of National Significance

1. INTRODUCTION

1.1 CONTEXT

This Biodiversity Management Sub-plan (BMP or Sub-plan) forms part of the Construction Environmental Management Plan (CEMP) for the HumeLink East Project (the Project). Acciona Genus Joint Venture (AGJV) has been contracted to deliver the Project.

An Environmental Impact Statement (EIS) (Aurecon, 2023) for the overall HumeLink Project (SSI-36656827) assessed the biodiversity impacts in response to the Secretary's Environmental Assessment Requirements issued by the Department of Planning, Housing and Infrastructure (DPHI). A Submissions Report (Aurecon 2024) was prepared to respond to submissions received during exhibition of the EIS. An Amendment Report was also subsequently prepared (Aurecon 2024), which includes a Revised Biodiversity Development Assessment Report (Technical Report 1 of the Amendment Report).

A referral under the EPBC Act (EPBC 2021/9121) was prepared and lodged with the Commonwealth Department of Climate Change, Energy, the Environment and Water due to the Project's potential significant impact on nationally threatened species and ecological communities.

The Commonwealth determined the Project to be a controlled action on 13 April 2022 and thus, it was assessed using the bilateral assessment process. As such, the Project also required approval from the Australian Minister for the Environment under the EPBC Act. Approval for the Project under the EPBC Act was granted by the Australian Minister for the Environment on 18 December 2024.

The NSW Minister for Planning approved the SSI 36656827 on the 13 Nov 2024 under S5.19 of the EP&A Act. This Sub-plan has been prepared to address the requirements of the Minister's Conditions of Approval (CoA), the HumeLink EIS and Submissions Report, the HumeLink Amendment Report and the Updated Mitigation Measures (UMMs) and all applicable guidance and legislation.

1.2 BACKGROUND

The overall HumeLink Project includes the construction and operation of around 365 kilometres of new 500-kilovolt (kV) electricity transmission lines, substations, permanent and temporary access tracks and roads, and ancillary facilities. The Project is being delivered under two separate Contract Packages - HumeLink East and HumeLink West. HumeLink East and HumeLink West will join and integrate to form HumeLink, and enable the overall Project to operate safely, reliably, and efficiently as part of Transgrid's network and the National Electricity Market (NEM) as a whole.

Figure 1 shows an indicative high-level scope of each Contract Package.

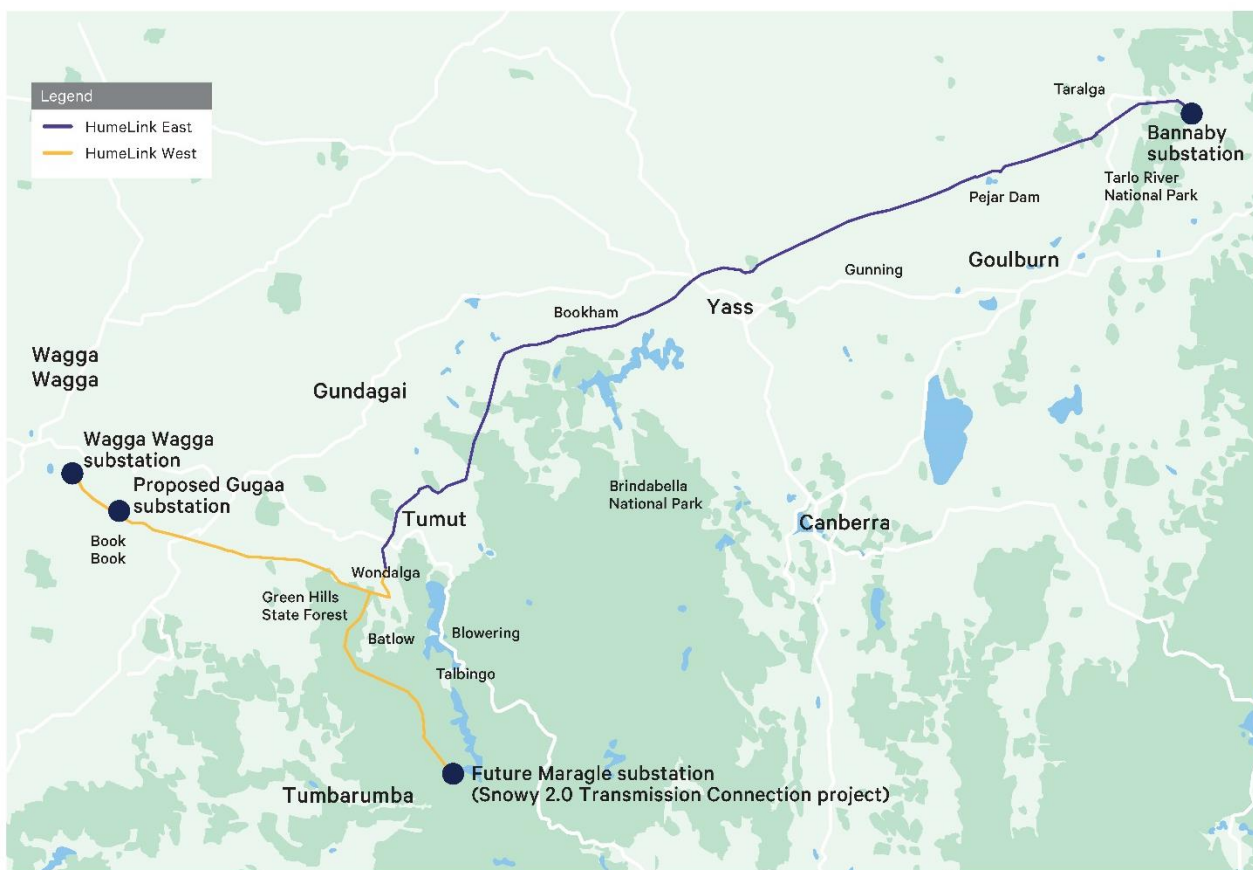


Figure 1: Indicative High-Level Scope of HumeLink East and HumeLink West

AGJV has been contracted to deliver the HumeLink East package (the Project). The Project includes the following key components:

- Augmenting the existing Bannaby 500 kV substation
- Delivering a new 500 kV double circuit transmission line connecting the augmented Bannaby 500 kV substation to the Interface Point where it will connect with HumeLink West
- Delivering the infrastructure required at the Interface Point to enable the connection of the HumeLink West and HumeLink East transmission line works – including the interface tower and associated infrastructure.

1.3 SCOPE

This Plan describes how AGJV will manage potential biodiversity impacts during construction of the Project, over the full duration of the construction program. A separate BMP is being developed for HumeLink West.

1.3.1 STAGING OF BMP

Operational biodiversity impacts, and operation measures and monitoring do not fall within the scope of this BMP and therefore are not included within the processes contained within this BMP. This plan addresses the Project construction works.

Remaining stages, including operation, upgrading and decommissioning, will be addressed in a separate document prepared by Transgrid prior to the commencement of the operational phase.

With reference to CoA B26, B27, B28 and B29, these conditions will be addressed by Transgrid per Table 3 and as detailed in this Plan. Refer to the Staging Report prepared by Transgrid for further detail on staging of requirements.

1.4 INTERFACE WITH OTHER PLANNING DOCUMENTS

This Sub-plan is a component of a suite of documents, prepared as part of the implementation of the Project's Environmental Management System. The Environmental Management System overview is described in Section 3.1 of the CEMP.

Management measures identified in this Sub-plan will be incorporated into relevant site-based documents including, but not limited to, site or activity-specific relevant work pack or Environmental Work Method Statements (EWMS), the geographical information system (GIS), environmental control maps (ECMs), and training and awareness material.

The key documents that interface with this Sub-plan are outlined in Table 1 below.

Table 1 Key interfaces with this document

Plan	Interface
Construction Environmental Management Plan, Environmental management documents (e.g. plans, protocols, strategies, reports, and programs).	- Provides details on overall Project staging, interactions between Sub-plans of the CEMP, and management of cumulative impacts - Provides a framework for how the construction works will be managed - Identifies procedures, processes and management systems that will apply in relation to construction activities - Provides environmental planning and controls for construction including environmental risk assessment, regulatory requirements, protection measures and sustainability requirements.
Soil and Water Management Plan (SWMP)	- Addresses controls to mitigate the risks of the migration of existing contamination to ecological receptors - Provides appropriate controls to mitigate the risk of new contamination during construction through appropriate handling and storage of contamination and response to spills - Addresses construction phase water quality monitoring including a trigger action response plan for water quality and levels.
Sustainability Management Plan	Addresses biodiversity-related sustainability requirements.

1.5 PREPARATION OF THIS PLAN

In accordance with CoA B30 of the Infrastructure Approval, this BMP has been prepared by a suitably qualified and experienced person. This BMP was prepared by:

- [REDACTED] BSc (Biology), Grad. Dip. (Bushfire Protection)
- [REDACTED] BSc (Zoology & Entomology), Hons (Zoology), PhD (Ecology).

[REDACTED] are Principal Ecologists for the project and accredited assessors under the Biodiversity Assessment Method 2020 (BAM).

2. PURPOSE AND OBJECTIVES

2.1 PURPOSE

The purpose of this BMP is to describe how the Project will manage and protect biodiversity during the construction of the Project.

2.2 OBJECTIVES

The key objectives of this BMP are to ensure all approval and contractual requirements relevant to biodiversity are described, scheduled, and assigned responsibility as outlined in:

- The Conditions of Approval (CoA) for the Project (Critical State Significant Infrastructure (CSSI) HumeLink Approval dated 13 November 2024 (Application no. SSI 36656827)
- Federal CoA for the Project (EPBC-2021/9121)
- The Environmental Impact Statement, Submissions Report and Amendment Report for the Project.

To achieve compliance with the conditions and objectives of the Project documents above, the Project will undertake the following:

- Implement appropriate measures to address the requirements outlined in the CoA, EIS, Submissions Report, Amendment Report and Revised BDAR
- Ensure best management practice controls and procedures are documented, communicated, and implemented during construction activities to avoid or minimise biodiversity impacts
- Implement appropriate measures to comply with all relevant legislative requirements as described in Section 3.1 of this BMP.

As a means of assessing environmental performance, environmental objectives (performance measures), targets (criteria), performance indicators and records have been established for the Project and are provided in Table 5 of the CEMP.

Performance measures and indicators relevant to biodiversity management are summarised in Table 2 from across the BMP with further details provided in Table 36 and Appendix H: Flora and Fauna Monitoring Program.

Table 2. Environmental objectives, targets, and performance indicators relevant to biodiversity.

Objectives (performance measures)	Targets (criteria)	Performance Indicators	Report/Records
1. Minimise and manage the impacts of the project on biodiversity.	- No exceedance to clearing values of known biodiversity including flora and fauna species as specified in CoA B25(a) - Minimise the risk of injury and mortality of fauna - Additional requirements to be applied within recorded locations of threatened flora species - Artificial hollow installation to commence as early as practicable prior to clearing activities in a particular location - Artificial hollow performance indicators outlined in Appendix H: Flora and Fauna Monitoring Program - No clearing undertaken within Biodiversity Exclusion Zones - Impact assessment completed prior to blasting and/or crushing activities and provided to NSW DCCEEW Environment and Heritage - Pre-construction survey completed at CLASS 1 streams identified as supporting potential habitats for threatened species at the site of proposed new tracks or upgraded tracks - Prevent direct or indirect impacts to threatened frogs - Prevent the establishment and spread of weeds, pests and pathogens within the Project footprint - Threatened insect habitat restored per Appendix G: Threatened Insect Habitat Rehabilitation Plan and Appendix H: Flora and Fauna Monitoring Program - No uncertain indirect or prescribed impacts are caused through Project works	- Clearing limits to be within those set in CoA B25 and Appendix 2 of the Infrastructure Approval and Section 7.6 of this BMP. - Zero fauna injured as a result of procedures not being adhered to. - Clearing methodology per Appendix B: Vegetation Clearing Procedures - Artificial hollows to be installed as close to the cleared area as possible (subject to landowner agreement and suitable trees being present) as early as practicable prior to clearing activities - Artificial hollow performance indicators per Appendix H: Flora and Fauna Monitoring Program - No clearing in Biodiversity Exclusion Zones and compliance with the biodiversity exclusion zone requirements per Appendix B: Vegetation Clearing Procedures - Impact assessment for blasting and/or crushing activities completed and provided to DCCEEW (if required) - Pre-construction Aquatic Biodiversity surveys completed prior to construction commencement at identified CLASS 1 streams - Threatened frog monitoring per Appendix H: Flora and Fauna Monitoring Program - Weed, pests and pathogen performance indicators per Appendix D: Biosecurity Management Plan and Appendix H: Flora and Fauna Monitoring Program - Threatened Insect Habitat rehabilitation performance indicators per Appendix H: Flora and Fauna Monitoring Program	- Clearing and Land Disturbance Register - Clearing and Land Disturbance Permit - Fauna Handling Record Sheet - Fauna Strike, Injury or Mortality Register - Weekly Environmental Inspection Checklists - Environmental Control Maps - Pre-clearing Reports - Post-clearing Reports - Threatened Flora Monitoring Report (baseline and ongoing) - Artificial Hollow Installation Reports - Artificial Hollow Monitoring Report (baseline and ongoing) - Weekly Environmental Inspection Checklists - Blasting and/or Crushing Impact Assessment - Pre-construction Aquatic Biodiversity Survey Report - Threatened Frog Monitoring Report (baseline and ongoing) - Weed Monitoring Report (baseline and ongoing) - Rehabilitation Monitoring Report (baseline and ongoing)

Objectives (performance measures)	Targets (criteria)	Performance Indicators	Report/Records
		Uncertain indirect or prescribed impacts by Project works are minimised and avoided through BMP implementation and monitoring performance indicators in Appendix H: Flora and Fauna Monitoring Program	
2. Rehabilitate and restore disturbance areas to pre-existing condition at tower pads, laydowns and brake and winch sites	- All temporary infrastructure is removed - Topsoil reinstated - Disturbed surfaces are adequately prepared, as per the Blue Book, to encourage and facilitate natural regeneration - All rubbish and waste materials are removed	- Temporary infrastructure removed - Topsoil has been reinstated in the previously disturbed areas - Disturbed surfaces are confirmed as stable and non-polluting (CPESC to confirm) - No visible rubbish or waste	- Erosion and Sediment Controls Plans - Environmental Controls Maps - Environmental Work Method Statements - Weekly Environmental Inspection Checklists
3. Rehabilitate and restore disturbance areas to pre-existing condition at access tracks and access points	- Operational requirements for access and consultation with the landowner confirm final land use - Where access track/point is restored, all infrastructure required to be removed has been removed - Where access track/point is restored, topsoil is reinstated	- Transgrid and/or landowner confirmation of final land use of the access track/point - Where access track/point is restored, infrastructure is removed - Where access track/point is restored, topsoil has been reinstated	- Erosion and Sediment Control Maps - Environmental Controls Maps - Environmental Work Method Statements - Weekly Environmental Inspection Checklists - Threatened Insect Habitat Rehabilitation Plan (where applicable)
4. Rehabilitate the ancillary facilities, accommodation camps and the earthworks material site in accordance with the following objectives: a. Ancillary facilities: i. safe, stable, and non-polluting ii. progressively rehabilitate the site as soon as possible following disturbance iii. to be decommissioned and removed, unless the Planning Secretary agrees otherwise b. Land use: i. restore land capability to preexisting use c. Community: i. ensure public safety at all times.	- Progressive erosion and sediment control plans prepared and implemented - Topsoil reinstated - Disturbed surfaces are adequately prepared, as per the Blue Book, to encourage and facilitate natural regeneration - No significant erosion is present that would compromise the establishment of vegetation - Commence decommissioning and/or rehabilitation within 1-2 months of completion of use of the site unless the Planning Secretary agrees otherwise - Redundant services including power are disconnected - Temporary construction fencing removed	- Erosion controls have been implemented. No further sediment controls are required as appropriate cover has been achieved - Topsoil has been reinstated in the previously disturbed areas - Disturbed surfaces are confirmed as stable and non-polluting (CPESC to confirm) - Controls that relate to rehabilitation are implemented in accordance with the Progressive Erosion and Sediment Control Plans (PESCPs) - Services are no longer connected - Temporary infrastructure removed. Agreement is to be obtained from the Planning Secretary if removal is not proposed - Temporary construction fencing removed	- Erosion and Sediment Controls Plans - Environmental Controls Maps - Environmental Work Method Statements - Weekly Environmental Inspection Checklists

Objectives (performance measures)	Targets (criteria)	Performance Indicators	Report/Records
	- For access tracks/ points and operational requirements for access, consultation with landowners to confirm final land use - All temporary infrastructure is removed including accommodation facilities and temporary buildings - Temporary construction fencing removed - Final land use agreed with landowners - Implementation of safety requirements during all decommissioning and rehabilitation works	- Transgrid and/or landowner confirmation of final land use of the access track/point - Landowner confirmation of final land use of the access track/point - Public access to the site is not provided until it is considered safe to do so	

2.3 SMART PRINCIPLES

This Sub-plan has been developed with consideration of SMART principles. This is achieved as follows:

- **Specific:** The measures listed in Section 7 of this Plan are specific to biodiversity management during construction. They include the development and implementation of plans and procedures tailored to address flora and fauna impacts, identification, and management of specific issues like unexpected finds of threatened species and threatened ecological communities, biosecurity, supplementary habitat, crossings and connectivity and weed and pathogen control.
- **Measurable:** This Sub-plan provides specific measures, requirements, and references that enable the evaluation and measurement of the effectiveness of each control measure. Monitoring programs and reporting requirements are outlined in Section 8.3, Section 8.7 and Appendix H: Flora and Fauna Monitoring Program, allowing for the assessment of impacts to biodiversity.
- **Achievable:** The control measures outlined in the Sub-plan are practical and achievable within the construction context. They involve the implementation of plans, investigations, and management strategies that can be feasibly executed during the construction phase.
- **Relevant:** The measures are directly relevant to biodiversity management during construction. They address potential impacts, such as those associated with vegetation clearing, fauna encounters and impacts to aquatic habitats. These measures are designed to mitigate or prevent these impacts on biodiversity.
- **Time-bound:** The Sub-plan specifies when each measure should be implemented, such as prior to and during construction. It also assigns responsibilities to specific roles, indicating the timeline and accountability associated with each measure.

3. ENVIRONMENTAL REQUIREMENTS

3.1 LEGISLATION

The following legislation and regulations are relevant to biodiversity management on the Project:

- *Environment Protection Biodiversity Conservation Act 1999* (EPBC Act) (Commonwealth)
- *Environmental Planning and Assessment Act 1979* (EP&A Act) (NSW)
- *Biodiversity Conservation Act 2016* (BC Act) (NSW)
- *Biosecurity Act 2015* (NSW)
- *Fisheries Management Act 1994* (FM Act) (NSW)
- *Protection of the Environment Operations Act 1997* (NSW)
- *National Parks and Wildlife Act 1974* (NSW)
- *Local Land Services Act 2013* (NSW)

Relevant provisions of the above legislation are detailed within the register of legal and other requirements included in Section 3.4.3 of the CEMP.

3.2 EPBC AND MINISTER'S CONDITIONS OF APPROVAL

The CoA relevant to this BMP are listed in Table 3. A cross-reference is also included to indicate where and how the conditions are addressed in this BMP or other Project management documents.

Table 3. CoA relevant to the Biodiversity Management Sub-plan.

CoA No.	Condition Requirements	Document Reference	How Addressed
Environmental Management Plan			
A8	Where conditions of this approval require consultation with an identified party, the Proponent must: (a) consult with the relevant party prior to submitting the subject document to the Planning Secretary for approval; and (b) provide details of the consultation undertaken including: (i) the outcome of that consultation, matters resolved and unresolved; and (ii) details of any disagreement remaining between the party consulted and the Proponent and how the Proponent has addressed the matters not resolved.	Section 4	Evidence of consultation with the parties listed in CoA B1 will be submitted to the Planning Secretary with this document.
Biodiversity - restriction of clearing and habitat			
B25	Unless otherwise agreed with the Planning Secretary, the Proponent must: (a) ensure that the vegetation and habitat clearing limits specified in Table 2-1, Table 2-2 and Table 2-3 of Appendix 2 are not exceeded; and	Section 7.6 Appendix B: Vegetation Clearing Procedures	Clearing will be managed in accordance with Appendix B: Vegetation Clearing Procedure. Progressive monitoring of the clearing quantities will occur to ensure that harm will not exceed the limits prescribed in CoA B25 per Section 7.6.
	(b) minimise: (i) the impacts of the development on hollow-bearing trees; (ii) the impacts of the development on threatened species; and (iii) the clearing of native vegetation and key habitat; and	Section 7.15 Appendix E: Supplementary Hollow and Nest Strategy Appendix H: Flora and Fauna Monitoring Program Appendix B: Vegetation Clearing Procedures	The mitigation measures identified within Section 7.15 will be implemented to ensure that clearing for the development minimises impacts to hollow-bearing trees, threatened flora and fauna populations, and the clearing of native vegetation and key habitats. Minimising impacts on hollow-bearing trees is detailed in Appendix E: Supplementary Hollow and Nest Strategy. Monitoring, inspections and auditing described in Section 7.15 and Appendix H: Flora and Fauna Monitoring Program of this BMP. Minimising impacts on the clearing of native vegetation and key habitat is detailed in Appendix B: Vegetation Clearing Procedures. Operational phase measures will be described in a separate document prepared by Transgrid for approval prior to the commencement of the operational phase.
	c) not undertake any works that result in ground disturbance within a minimum setback distance of 50 metres from PCT 637 – <i>Alpine and sub-alpine peatlands, damp herbfields and fens, South Eastern Highlands Bioregion and Australian</i>	-	This condition does not apply to the HumeLink East works.

CoA No.	Condition Requirements	Document Reference	How Addressed
	<i>Alps Bioregion</i> and 30 metres from known locations of <i>Prasophyllum bagoensis</i> , <i>Prasophyllum keltonni</i> and <i>Pterostylis oreophila</i> as mapped in the BDAR.		
Biodiversity Offset Package			
B26	Prior to carrying out any development that would impact on biodiversity values requiring offset or within 3 months of the date of the Project Approval whichever is sooner, the Proponent must update the Biodiversity Offset Package (Package) that is consistent with the EIS, in consultation with BCS and BCT and to the satisfaction of the Planning Secretary in writing. The Package must include, but not necessarily be limited to:	Section 7.1 Biodiversity Offset Package	Transgrid has prepared a Biodiversity Offset Package in consultation with BCS and to the satisfaction of the Planning Secretary. Information relating to the offset package is provided in Section 7.1.
	(a) details of the specific biodiversity offset measures to be implemented and delivered in accordance with the EIS;	Section 7.1 Biodiversity Offset Package	The Biodiversity Offset Package will include specific offset measures which are to be implemented.
	(b) the cost for each specific biodiversity offset measure, as determined in accordance with a BCF Charge Statement indexed on a monthly basis in accordance with the Biodiversity Offsets Payment Calculator Order 2022;	Section 7.1 Biodiversity Offset Package	The Biodiversity Offset Package will include the cost for each specific measure which will be required to be paid if the measure is not implemented.
	(c) the timing and responsibilities for the implementation and delivery of the measures required in the Package;	Section 7.1 Biodiversity Offset Package	The timing and responsibilities for implementation of the measures will be included in the Biodiversity Offset Package.
	(d) a report to be provided every 6 months from the approval of the Package to the Department, BCS and the BCT setting out the progress towards delivering each specific biodiversity offset measure; and	Section 7.1 Biodiversity Offset Package	Reporting responsibilities and timing will be included in the Biodiversity Offset Package.
	(e) confirmation that the biodiversity offset measures will have been implemented and delivered no later than 13 November 2026, unless otherwise agreed with the Planning Secretary.	Section 7.1 Biodiversity Offset Package	The Biodiversity Offset Package will confirm the measures that have been implemented and those that will be delivered no later than 13 November 2026.
B27	Prior to carrying out any development that could impact the biodiversity values requiring offset, the Proponent must lodge bank guarantee(s) with a total value of \$502,332,107, in accordance with the Deed of Agreement with the Planning Secretary (or delegate) executed on 10 October 2024. The Proponent must comply with the terms of the Deed.	Section 7.1 Biodiversity Offset Package	Bank guarantees will be provided for the full amount to meet the requirements of this condition.
Supplementary Biodiversity Strategy			
B28	Prior to carrying out any development that would impact on the relevant biodiversity values (excluding Enabling Works, if the relevant requirements of this condition are adequately addressed in the Enabling Works Management Plan of condition B64), the Proponent must prepare a Supplementary Biodiversity Strategy as committed to in the EIS, in consultation with BCS and to the satisfaction of the Planning Secretary. Unless otherwise agreed by the Planning Secretary, the Strategy must:	Section 7.2 Supplementary Biodiversity Strategy	Transgrid will prepare a Supplementary Biodiversity Strategy in consultation with BCS and to the satisfaction of the Planning Secretary. Information relating to the Supplementary Biodiversity Strategy is provided in Section 7.2.

CoA No.	Condition Requirements	Document Reference	How Addressed
	(a) be peer-reviewed by a suitably qualified, experienced and independent biodiversity consultant with Biodiversity Assessment Method (2020) (BAM) Accreditation whose appointment has been endorsed by the Planning Secretary;	Section 7.2 Supplementary Biodiversity Strategy	The Supplementary Biodiversity Strategy will be peer-reviewed by a suitably qualified, experienced and independent BAM-accredited biodiversity consultant endorsed by the Planning Secretary. Information relating to the Supplementary Biodiversity Strategy is provided in Section 7.2.
	(b) detail survey methods for all entities to be targeted by the Strategy, in accordance with the Biodiversity Assessment Method (2020) and any other guidance document that is relevant and applicable at the time surveys were undertaken or the BDAR was prepared, including but not limited to: (i) surveys within unsurveyed areas of the development area identified in the EIS where a reduction in credit liability for the relevant biodiversity value assumed present is being sought; (ii) surveys for the following serious and irreversible impact (SAII) entities: • <i>Prasophyllum bagoense</i> • <i>Pterostylis oreophila</i> • <i>Caladenia concolor</i> • <i>Genoplesium superburn</i> • <i>Pomaderris delicata</i> • <i>Litoria castanea</i> • <i>Prasophyllum innubum</i> • <i>Solanum armourense</i> • <i>Calotis glandulosa</i> • <i>Pseudomy fumeus</i> • <i>Pimelea bracteata</i> • <i>Grevillea iaspicula</i> • <i>Pomaderris pallida</i> • <i>Mixophyes balbus</i> • <i>Prasophyllum keltonii</i> • <i>Bossiae fragrans</i> • <i>Eucalyptus robertsonii subsp. hemisphaerica</i> • <i>Grevillea wilkinsonii</i> • <i>Chalinolobus dwyeri</i> • <i>Tyto tenebricosa</i>	Section 7.2 Supplementary Biodiversity Strategy	The Supplementary Biodiversity Strategy will detail survey methods for all entities to be targeted by the Strategy including, but not limited to, surveys within unsurveyed areas of the development area identified in the EIS where a reduction in credit liability for the relevant biodiversity value assumed present is being sought and surveys for the listed SAI entities. Information relating to the Supplementary Biodiversity Strategy is provided in Section 7.2.
Biodiversity Assessment Verification Report			
B29	Unless otherwise agreed by the Planning Secretary, prior to carrying out any development that would impact on the relevant biodiversity values subject to survey in the Supplementary Biodiversity Strategy in condition B28 (excluding Enabling Works, if the relevant requirements of this condition are adequately addressed in the Enabling Works Management Plan of condition B64), the Proponent must prepare a Biodiversity Assessment Verification Report in consultation with BCS and to the satisfaction of the Planning Secretary. The Report must:	Section 7.3. Biodiversity Assessment Verification Report	Transgrid will prepare a Biodiversity Assessment Verification Report in consultation with BCS and to the satisfaction of the Planning Secretary. Information relating to the Biodiversity Assessment Verification Report is provided in Section 7.3.
	(a) be prepared by a suitably qualified, experienced and independent biodiversity consultant with Biodiversity Assessment Method (2020) (BAM)	Section 7.3.	The Biodiversity Assessment Verification Report will be prepared by a suitably qualified, experienced and

CoA No.	Condition Requirements	Document Reference	How Addressed
	Accreditation whose appointment has been endorsed by the Planning Secretary;	Biodiversity Assessment Verification Report	independent BAM-accredited biodiversity consultant endorsed by the Planning Secretary. Information relating to the Biodiversity Assessment Verification Report is provided in Section 7.3.
	(b) be prepared in accordance with the Biodiversity Assessment Method (2020) and any other guidance document that is relevant and applicable at the time surveys were undertaken or the BDAR was prepared;	Section 7.3. Biodiversity Assessment Verification Report	The Biodiversity Assessment Verification Report will be prepared with reference to the BAM and any other applicable and relevant guidance documentation. Information relating to the Biodiversity Assessment Verification Report is provided in Section 7.3.
	(c) be prepared with regard to the final layout plans for the development required under condition C8, including the location of final access routes within each clearing zone and stockpile locations;	Section 7.3. Biodiversity Assessment Verification Report	The Biodiversity Assessment Verification Report will be prepared with regard to the final layout plans for the development. Information relating to Biodiversity Assessment Verification Report is provided in Section 7.3.
	(d) include: (i) detail of the outcomes of surveys undertaken in accordance with condition B28; (ii) where species are found to be present following the surveys undertaken under condition B28 or that are assumed to be present, identify measures to avoid and/or mitigate the impact to those entities for inclusion in a revised version of the Biodiversity Management Plan required under condition B30;	Biodiversity Assessment Verification Report	The Biodiversity Assessment Verification Report will detail of the outcomes of surveys and identify any measures to avoid and/or mitigate the impact to any species found to be present or assumed present for inclusion in a revised version of this BMP. Information relating to the Biodiversity Assessment Verification Report is provided in Section 7.3.
	(e) provide findings and recommendations relating to the matters in (d), including, but not limited to, reducing the relevant credit obligations and calculating credit obligations for unexpected finds.	Section 7.3. Biodiversity Assessment Verification Report	The Biodiversity Assessment Verification Report will provide findings and recommendations including those relating to reducing credit obligations and calculating credit obligations for unexpected finds. Information relating to the Biodiversity Assessment Verification Report is provided in Section 7.3.
	Any required changes to biodiversity offset or mitigation measures arising from the Biodiversity Assessment Verification Report must be incorporated into an updated version of the Biodiversity Offset Package under condition B26 in consultation with BCS and BCT and addressed in a revised version of the Biodiversity Management Plan required under condition B30, in consultation with BCS and FCNSW, to the satisfaction of the Planning Secretary.	Section 7.3. Biodiversity Assessment Verification Report	The Biodiversity Offset Package will be revised to incorporate any required changes to biodiversity offset obligations arising from the Biodiversity Assessment Verification Report in consultation with BCS, to the satisfaction of the Planning Secretary. This BMP will be revised to address any required changes to mitigation measures arising from the Biodiversity Assessment Verification Report, including in relation to Solanum armourense, in consultation with BCS, to the satisfaction of the Planning Secretary and provide to CPHR. The BMP will be updated within 3 months of the Planning

CoA No.	Condition Requirements	Document Reference	How Addressed
			Secretary's approval of the BAVR. Information relating to the Biodiversity Assessment Verification Report is provided in Section 7.3.
Biodiversity Management Plan			
B30	Prior to carrying out any development (excluding Enabling Works, if the relevant requirements of this condition are adequately addressed in the Enabling Works Management Plan of condition B64) that could impact biodiversity values that require offsetting, the Proponent must prepare a Biodiversity Management Plan for the development to the satisfaction of the Planning Secretary. This plan must:	This BMP	This BMP has been prepared for the construction phase of the project and will be submitted for the approval of the Planning Secretary. The relevant requirements of this condition have been addressed in the Enabling Works Management Plan for enabling works. No development (other than Enabling Works) that could impact on biodiversity values requiring offsetting will be undertaken prior to the approval of this BMP. Operational phase management will be described in a separate document prepared by Transgrid for approval prior to the commencement of the operational phase.
	(a) be prepared by a suitably qualified and experienced biodiversity expert/s;	Section 1.5	This BMP has been prepared by suitably qualified and experienced biodiversity experts as detailed in Section 1.5.
	(b) be prepared in consultation with BCS and FCNSW;	Section 4	This BMP has been prepared in consultation with BCS and FCNSW as detailed in Section 4.
	(c) be prepared generally in accordance with the <i>Revised Biodiversity Development Assessment Report</i> (Revision 0, dated 21 June 2024);	Section 5.1	This BMP has been prepared generally in accordance with the Revised Biodiversity Development Assessment Report (Revision 0, dated 21 June 2024) as detailed in Section 5.1.
	(d) include a description of the measures that would be implemented for: (i) meeting the biodiversity mitigation requirements in condition B25 and as required by condition B29;	Section 7 Section 7.6. Appendix B: Vegetation Clearing Procedures	This BMP includes measures that would be implemented within Section 7, Section 7.15 and the Appendices. Clearing will be managed in accordance with Appendix B: Vegetation Clearing Procedures. Progressive monitoring of the clearing quantities will occur to ensure that harm will not exceed the limits prescribed in CoA B25(a) per Section 7.6.

CoA No.	Condition Requirements	Document Reference	How Addressed
			This BMP will be revised to address any required changes to mitigation measures arising from the Biodiversity Assessment Verification Report in consultation with BCS and to the satisfaction of the Planning Secretary. Operational phase measures will be described in a separate document prepared by Transgrid for approval prior to the commencement of the operational phase.
	(ii) minimising the amount of vegetation clearing on site;	Section 7.7 Appendix B: Vegetation Clearing Procedures	Vegetation clearing will be minimised through ongoing reviews of detailed design, construction methodologies and construction impacts to determine opportunities to minimise clearing.
	the loss of key fauna habitat (including tree hollows);	Section 7.7 Appendix B: Vegetation Clearing Procedures Appendix E: Supplementary Hollow and Nest Strategy Appendix G: Threatened Insect Habitat Rehabilitation Plan	Impacts to key fauna habitat and tree hollows will be minimised where possible through reviews of detailed design and temporary design (i.e. access tracks and laydown locations) and implementation of the vegetation clearing procedures.
	the impacts of fauna on site, including undertaking pre-clearance surveys; and	Section 7.7 Appendix B: Vegetation Clearing Procedures Appendix C: Fauna Handling and Rescue Procedures	Pre-clearing surveys will include inspections for fauna prior to clearing. Identified fauna will be relocated into adjacent suitable habitat. This process is identified within Appendix B: Vegetation Clearing Procedures and Appendix C: Fauna Handling and Rescue Procedures.
	potential indirect impacts on threatened flora and fauna species;	Section 6.3 Appendix B: Vegetation Clearing Procedures	Indirect impacts to threatened fauna and flora species may include, for example, soil and water runoff impacting the adjoining threatened ecological communities. Measures have been incorporated in Section 6.3 in relation to erosion and sedimentation management. Operational phase measures will be described in a separate document prepared by Transgrid for approval prior to the commencement of the operational phase.
	(iii) ensuring the development does not adversely affect the native vegetation and habitat outside the disturbance footprint;	Appendix B: Vegetation Clearing Procedures Appendix D: Biosecurity Management Plan	Construction clearing will be undertaken in accordance with Appendix B: Vegetation Clearing Procedures.

CoA No.	Condition Requirements	Document Reference	How Addressed
			Appendix D: Biosecurity Management Plan includes measures to control the spread of weeds and feral pest management. Operational phase measures will be described in a separate document prepared by Transgrid for approval prior to the commencement of the operational phase.
	(iv) protocols for unexpected finds of threatened species and threatened ecological communities within the disturbance footprint including the requirements for: • all work in the associated location to stop to prevent further impact, and • notification to the Planning Secretary and BCS (and AG DCCEEW where relevant) in writing on any additional mitigation measures to be implemented; and • relevant agencies to be consulted and the Planning Secretary to endorse recommencement of work;	Appendix A: Unexpected Species Finds Protocol	An unexpected finds protocol for threatened species and threatened ecological communities is provided in Appendix A: Unexpected Species Finds Protocol
	(v) connectivity strategy for the potentially impacted species identified in the <i>Revised Biodiversity Development Assessment Report</i> (Revision 0, dated 21 June 2024) and a Supplementary Hollow and Nest Strategy;	Appendix F: Connectivity Strategy Appendix E: Supplementary Hollow and Nest Strategy	Connectivity corridors will be provided adjacent to towers at select locations along the easement. A Connectivity Strategy is provided within Appendix F: Connectivity Strategy and a Supplementary Hollow and Nest Strategy is provided within Appendix E: Supplementary Hollow and Nest Strategy. Operational phase measures/monitoring will be described in a separate document prepared by Transgrid for approval prior to the commencement of the operational phase.
	(vi) protecting the conservation values of McPhersons Plain and avoiding impacts to <i>Prasophyllum bagoensis</i> , <i>Prasophyllum kelttoni</i> and <i>Pterostylis oreophila</i> ;	-	This condition does not apply to the HumeLink East works.
	(vii) rehabilitating temporary disturbance areas to facilitate natural regeneration of suitable native species;	Section 7.12 Appendix G: Threatened Insect Habitat Rehabilitation Plan Appendix H: Flora and Fauna Monitoring Program Soil and Water Management Plan	Rehabilitation of temporary disturbance areas such as the ancillary facilities, accommodation camps and earthwork material sites would be carried out in accordance with progressive erosion and sediment control plans (to provide safe, stable and non-polluting areas). Monitoring and associated reporting is detailed in Appendix H: Flora and Fauna Monitoring Program

CoA No.	Condition Requirements	Document Reference	How Addressed
	(viii) progressively monitoring the areas of partial clearance following the commencement of construction and provision of a verification report every three months during construction to confirm the assumptions made in the BDAR regarding partial clearance within the Easement Clearing Zone and whether any changes are required to this plan;	Section 7.6 Appendix H: Flora and Fauna Monitoring Program Appendix B: Vegetation Clearing Procedures	Areas subject to partial clearance will be progressively monitored from the commencement of construction per Appendix H: Flora and Fauna Monitoring Program. A partial clearance verification report will be provided every three months during construction to confirm the assumptions made in the BDAR regarding partial clearance within the Easement Clearing Zone and whether any changes are required to the Appendix B: Vegetation Clearing Procedures. Construction clearing will be undertaken in accordance with Appendix B: Vegetation Clearing Procedures.
	(ix) maximising the salvage of resources within the approved disturbance area – including vegetative and soil resources – for beneficial reuse (such as fauna habitat enhancement) during the rehabilitation and revegetation of the site;	Section 7.12 Appendix E: Supplementary Hollow and Nest Strategy	The salvage of resources for beneficial reuse is included in Appendix E: Supplementary Hollow and Nest Strategy.
	(x) collecting and propagating seed (where relevant);	Appendix B: Vegetation Clearing Procedures	Seed collection and propagation from Rice Flower (<i>Pimelea bracteata</i>) per 'AAM - HumeLink's SAIL - letter to BCD - September 2024_FINAL_v1' will be undertaken in accordance with Appendix B: Vegetation Clearing Procedures.
	(xi) controlling erosion, weeds and feral pests;	Soil and Water Management Plan Appendix D: Biosecurity Management Plan	Section 8.3 includes measures for controlling erosion. The Soil and Water Management Plan has also been prepared to manage and minimise erosion and sedimentation impacts. Appendix D: Biosecurity Management Plan includes measures for feral pest management and to control the spread of weeds.
	(xii) bushfire management	Section 6.2.3 Section 7.10 Bushfire and Emergency Management and Evacuation Plan (HLE-AUR-ENV-ALE-PLN-0000-00001)	Bushfire risk and management are detailed in Section 6.2.3 and Section 7.10. Risk of increased bushfire will be managed by the Bushfire and Emergency Management and Evacuation Plan (HLE-AUR-ENV-ALE-PLN-0000-00001) prepared to prevent and mitigate the potential for fires, including bushfires. Detailed design specifications will be adopted to ensure conductor clearance heights adhere to recommended levels to minimise any risk of arcing or potential fire events as detailed in Section 6.2.3 Operational aspects will be managed by Transgrid.

CoA No.	Condition Requirements	Document Reference	How Addressed
	(xiii) minimising impacts on entities at risk of a serious and irreversible impact (SAIL), including for Box Gum Woodland, Rice Flower (<i>Pimelea bracteata</i>) and Sooty Owl (<i>Tyto tenebricosa</i>) and other entities that are identified as requiring mitigation measures in the Biodiversity Assessment Verification Report required by condition B29 and the additional mitigation measures outlined in the additional information (Transgrid proposal dated 2 September 2024) within three years of the date of the Project Approval (over and above the relevant credit obligations); and	Section 7.3 Section 7.6 Transgrid proposal dated 2 September 2024 'AAM - HumeLink's SAIL - letter to BCD - September 2024_FINAL_v1'.	Serious and irreversible impacts will be avoided and minimised through the mitigation measures outlined in this BMP including through the implementation of the Biodiversity Constraints hierarchy detailed in Section 7.6 and the Biodiversity Verification Assessment Report to be undertaken by Transgrid as detailed in Section 7.3. This BMP will be revised to address any required changes to mitigation measures arising from the BVAR. Operational phase measures will be described in a separate document prepared by Transgrid for approval prior to the commencement of the operational phase.
	(e) include a program to monitor, evaluate and publicly report on the effectiveness of these measures.	Section 7.15 Table 36 Appendix H: Flora and Fauna Monitoring Program	Monitoring and reporting on the effectiveness of these measures will be undertaken in accordance with Section 7.15, Table 36 and Appendix H: Flora and Fauna Monitoring Program. This will include pre-clearing inspections, clearing inspections, weekly inspections, auditing, monitoring and reporting. Operational phase measures will be described in a separate document prepared by Transgrid for approval prior to the commencement of the operational phase.
	Following the Planning Secretary's approval, the Proponent must implement the Biodiversity Management Plan.	This Plan	This Plan will be implemented following the Planning Secretary's approval.
Riparian Areas			
B22	The Proponent must ensure all activities on waterfront land are constructed in accordance with the <i>Guidelines for Controlled Activities on Waterfront Land</i> (DPE 2022), <i>Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings</i> (NSW Fisheries 2003) and the <i>Policy and Guidelines for Fish Habitat and Conservation and Management</i> (NSW Fisheries, 2013), unless Water Group and DPIRD Fisheries agrees otherwise.	Section 7	The mitigation measures identified in Section 7 will be implemented to ensure that all activities on waterfront land are constructed in accordance with the guidelines specified in CoA B22.
Rehabilitation			
B62	Unless the Planning Secretary agrees otherwise, within 12 months of commencing operation of the project, the Proponent must decommission and rehabilitate the accommodation camps to the satisfaction of the Planning Secretary. This rehabilitation must comply with the objectives in Table 3. Table 3: Rehabilitation Objectives	Section 7.12 Table 36 Appendix H: Flora and Fauna Monitoring Program	Rehabilitation of the Project will be carried out in accordance with Section 7.12 and Table 36 Rehabilitation monitoring will be undertaken in accordance with Appendix H: Flora and Fauna Monitoring Program and

CoA No.	Condition Requirements	Document Reference	How Addressed								
	<table><tr><th>Feature</th><th>Objective</th></tr><tr><td>Accommodation camp</td><td> - Safe, stable and non-polluting - All infrastructure including above and below ground to be decommissioned and removed to a depth of 500 mm, unless the Planning Secretary agrees otherwise - Restoring land capability to pre-existing productive capacity - Ensure public safety at all times </td></tr></table>	Feature	Objective	Accommodation camp	- Safe, stable and non-polluting - All infrastructure including above and below ground to be decommissioned and removed to a depth of 500 mm, unless the Planning Secretary agrees otherwise - Restoring land capability to pre-existing productive capacity - Ensure public safety at all times						
Feature	Objective										
Accommodation camp	- Safe, stable and non-polluting - All infrastructure including above and below ground to be decommissioned and removed to a depth of 500 mm, unless the Planning Secretary agrees otherwise - Restoring land capability to pre-existing productive capacity - Ensure public safety at all times										
B63	Unless the Planning Secretary agrees otherwise, within 6 months of the completion of construction, upgrading or decommissioning, the Proponent must rehabilitate the areas where ancillary facilities and earthwork material sites are located. This rehabilitation must comply with the objectives in Table 4. Table 4: Rehabilitation Objectives <table><tr><th>Feature</th><th>Objective</th></tr><tr><td>Ancillary facilities</td><td> - Safe, stable and non-polluting - Progressively rehabilitate the site as soon as possible following disturbance. - To be decommissioned and removed, unless the Planning Secretary agrees otherwise </td></tr><tr><td>Land use</td><td>Restore or maintain land capability to pre-existing use</td></tr><tr><td>Community</td><td>Ensure public safety</td></tr></table>	Feature	Objective	Ancillary facilities	- Safe, stable and non-polluting - Progressively rehabilitate the site as soon as possible following disturbance. - To be decommissioned and removed, unless the Planning Secretary agrees otherwise	Land use	Restore or maintain land capability to pre-existing use	Community	Ensure public safety	Section 7.12 Appendix H: Flora and Fauna Monitoring Program	Rehabilitation of the Project will be carried out in accordance with Section 7.12. Rehabilitation monitoring will be undertaken in accordance with Appendix H: Flora and Fauna Monitoring Program
Feature	Objective										
Ancillary facilities	- Safe, stable and non-polluting - Progressively rehabilitate the site as soon as possible following disturbance. - To be decommissioned and removed, unless the Planning Secretary agrees otherwise										
Land use	Restore or maintain land capability to pre-existing use										
Community	Ensure public safety										
Independent Environmental Audit											
C13	Independent Audits of the development must be conducted and carried out in accordance with the Independent Audit Post Approval Requirements (2020) or as updated from time to time and published on the Department’s website.	Section 8.5	Section 8.5 details that independent audits will be carried out in accordance with the Independent Audit Post Approval Requirements (2020) unless otherwise agreed or directed by the Planning Secretary								
Access to Information											
C15	The Proponent must: (a) make the following information and documents publicly available on its website as relevant to the stage of the development: (i) the EIS; (ii) the final layout plans for the development;	Section 4.2	Section 4.2 states that the information required by CoA C15 will be made publicly available on the Project website.								

CoA No.	Condition Requirements	Document Reference	How Addressed
	(iii) current statutory approvals for the development; (iv) approved strategies, plans or programs required under the conditions of this approval; (v) the proposed staging plans for the development if the construction, operation and/or decommissioning of the development is to be staged; (vi) a comprehensive summary of the monitoring results of the development, which have been reported in accordance with the various plans and programs approved under the conditions of this approval; (vii) how complaints about the development can be made; (viii) a record of complaints, which is to be updated on a monthly basis; (ix) any independent environmental audit, and the Proponent's response to the recommendations in any audit; and (x) any other matter required by the Planning Secretary; and (b) keep this information up to date.		
EPBC Conditions of Approval			
1	The approval holder must undertake clearing and construction activities in accordance with conditions A2(c) and A2(d) of the NSW approval to the extent that they relate to protected matters.	Section 7.6 Appendix B: Vegetation Clearing Procedure	Clearing will be managed in accordance with Appendix B: Vegetation Clearing Procedure. Progressive monitoring of the clearing quantities will occur to ensure that harm will not exceed the limits prescribed in CoA B25.
2	To avoid and mitigate harm to protected matters, the approval holder must comply with condition B25 of the NSW approval to the extent that it relates to protected matters.	Section 7.15 Appendix H: Flora and Fauna Monitoring Program	The mitigation measures identified within Section 7.15 will be implemented to ensure that clearing for the development minimises impacts to hollow-bearing trees, threatened flora and fauna populations, and the clearing of native vegetation and key habitats. Monitoring, inspections and auditing described in Section 7.15 and Appendix H: Flora and Fauna Monitoring Program of this BMP will check the implementation and effectiveness of the management measures identified in Section 7.15
3	Prior to carrying out any activity that could harm Habitat for Bago Leek-orchid, Habitat for Brandy Marys Leek Orchid, Habitat for Kelton's Leek-orchid and Habitat for Blue-tongued Orchid, the approval holder must submit an Orchid Management Plan to the department for the Minister's approval.	-	This condition does not apply to the HumeLink East works.
4	The approval holder must not harm any Habitat for Bago Leek-orchid, Habitat for Brandy Marys Leek Orchid, Habitat for Kelton's Leek-orchid and Habitat for Blue-tongued Orchid unless the Minister has approved the Orchid Management	-	This condition does not apply to the HumeLink East works.

CoA No.	Condition Requirements	Document Reference	How Addressed
	Plan in writing. The approval holder must implement the Orchid Management Plan approved by the Minister during construction and operation until the expiry of this approval.		
5	The Orchid Management Plan must be prepared by a suitably qualified orchid specialist. All commitments, including environmental outcomes, management measures, corrective measures, trigger values and performance indicators in the Orchid Management Plan must be SMART and based on referenced or included evidence of effectiveness. The Orchid Management Plan must be consistent with the Environmental Management Plan Guidelines, and must include: a) clear environmental outcomes for the implementation of the plan, b) details of the Bago Leek-orchid, Brandy Marys Leek Orchid, Kelton's Leek-orchid and the Blue-tongued Orchid and a reference to the EPBC Act approval conditions to which the plan refers, c) a table of commitments made in the plan to achieve the environmental outcomes, and a reference to exactly where these commitments are detailed in the plan, d) commitments capable of ensuring that the environmental outcomes are achieved, e) reporting and review mechanisms to demonstrate compliance with the commitments made in the plan, f) an assessment of risks relating to achieving the environmental outcomes and risk management strategies and/or mitigation measures that will be applied to address identified risks, g) impact avoidance, mitigation and/or repair/compensation measures, and the timing of those measures, h) a monitoring program, which must include: i) performance indicators, ii) trigger values for corrective measures, iii) the timing and frequency of monitoring, ensuring monitoring is capable of detecting trigger values and changes in the performance indicators, and iv) proposed corrective measures if trigger values are reached, i) links to other relevant plans or conditions of approval (including state or territory approval conditions), j) consistency with species specific guidelines/conservation advices for the Bago Leek-orchid, Brandy Marys Leek Orchid, Kelton's Leek-orchid and the Blue-tongued Orchid.	-	This condition does not apply to the HumeLink East works.

CoA No.	Condition Requirements	Document Reference	How Addressed
6	The approval holder must provide to the department the Supplementary Biodiversity Strategy and Biodiversity Assessment Verification Report required under conditions B28 and B29 of the NSW approval.	Section 7.2 Section 7.3 Supplementary Biodiversity Strategy Biodiversity Assessment Verification Report	Transgrid will prepare a Supplementary Biodiversity Strategy in consultation with BCS and to the satisfaction of the Planning Secretary. Information relating to the Supplementary Biodiversity Strategy is provided in Section 7.2. Transgrid will prepare a Biodiversity Assessment Verification Report in consultation with BCS and to the satisfaction of the Planning Secretary. Information relating to the Biodiversity Assessment Verification Report is provided in Section 7.3.
7	The approval holder must comply with condition B30 (Biodiversity Management Plan) of the NSW Approval. The Biodiversity Management Plan must be prepared in accordance with the Environmental Management Plan Guidelines and condition B30 of the NSW Approval.	This BMP	This BMP has been prepared in accordance with condition B30 (Biodiversity Management Plan) of the NSW Approval.
8	To compensate for the residual significant impacts of the Action on protected matters, the approval holder must submit to the department a Biodiversity Offset Package 10 business days prior to obtaining approval of the Biodiversity Offset Package from the NSW Planning Secretary. The Biodiversity Offset Package must be prepared in accordance with condition B26 of the NSW approval.	Section 7.3. Biodiversity Assessment Verification Report	The Biodiversity Offset Package will be revised to incorporate any required changes to biodiversity offset obligations arising from the Biodiversity Assessment Verification Report in consultation with BCS, to the satisfaction of the Planning Secretary. This BMP will be revised to address any required changes to mitigation measures arising from the Biodiversity Assessment Verification Report in consultation with BCS, to the satisfaction of the Planning Secretary. Information relating to the Biodiversity Assessment Verification Report is provided in Section 7.3.
9	The approval holder must provide a report in writing to the department confirming that the biodiversity offset measures in the Biodiversity Offset Package for the protected matters that have required offsets under this approval have been implemented and delivered by 13 November 2026 or timing otherwise agreed by the NSW Planning Secretary.	Section 7.3. Biodiversity Assessment Verification Report	The Biodiversity Offset Package will be revised to incorporate any required changes to biodiversity offset obligations arising from the Biodiversity Assessment Verification Report in consultation with BCS, to the satisfaction of the Planning Secretary. This BMP will be revised to address any required changes to mitigation measures arising from the Biodiversity Assessment Verification Report in consultation with BCS, to the satisfaction of the Planning Secretary. Information relating to the Biodiversity Assessment Verification Report is provided in Section 7.3.

3.3 UPDATED MITIGATION MEASURES

Relevant Updated Mitigation Measures (UMMs), as identified in Appendix B.1 of the Amendment Report, are listed in Table 4 below. A cross-reference is also included to indicate where and how the conditions are addressed in this BMP or other Project management documents.

Table 4 UMMs relevant to the Biodiversity Management Sub-plan

Aspect	Ref UM M #	Commitment	How Addressed	Location	Threatened Species Applicable	Timing (Project Phase)	Responsibility	Performance Indicator	Monitoring Method	Monitoring Timing and Frequency	Reporting (to who and when)	Trigger for action	Response & adaptive management (corrective action)	Document Reference
Biodiversity conservation significance	B1	Impacts to matters of biodiversity conservation significance will be avoided to the greatest extent practicable during finalisation of the design and construction methodology for the Project. Biodiversity constraints mapping will be used to guide prioritisation of areas of high biodiversity conservation significance (particularly serious and irreversible impacts (SAls), and critically endangered ecological communities (CEECs)) to avoid, where practicable. Spatial data, threatened species locations and constraints mapping will be provided to the design and construction teams and considered in detailed design. Associated mapping will be included on sensitive area plans and provided to the construction workforce. Micro-siting of the transmission line infrastructure and associated work sites and other areas of disturbance (e.g. controlled blasting and rock crushing sites) will occur to avoid or minimise impacts wherever practicable. Site features with the highest biodiversity conservation significance, in particular recorded threatened species, and their habitat, will be given the highest priority for impact avoidance. This will also include micro-siting to avoid or minimise prescribed impacts (as described in Technical Report 1 – Revised Biodiversity Development Assessment Report (the BDAR)) where possible (i.e. avoiding impact to rocky habitats or caves and waterways). Micro-siting of infrastructure requiring sub-surface work, such as transmission line structure footings, will be undertaken as part of the detailed design stage of the Project, to minimise prescribed impacts where possible (i.e. avoiding impact to breeding habitat features,	During detailed design, opportunities to site items in locations where impacts to matters of biodiversity conservation significance are avoided and reduced will occur. Mapping of spatial data, buffered threatened species locations and constraints mapping would be included in the geographical information system (GIS). Vegetation clearing procedures, including measures to protect retained vegetation and minimise impacts to biodiversity, in line with the HumeLink Vegetation Clearing Method and Management Memorandum (Nov 2023), are included in Appendix B: Vegetation Clearing Procedures. Management and mitigation measures addressing the UMMs relevant to the Project are summarised in Section 7.15	Disturbance footprint	All species	Detailed Design Pre construction Construction	Design Manager Environment and Sustainability Manager Ecologist Construction Manager Supervisor	Impacts to matters of biodiversity conservation significance are avoided and minimised through detailed design (Micrositing, biodiversity constraints mapping) Vegetation clearing undertaken per with App B VCP Threatened flora pre-clearing and clearing undertaken per App B VCP	Review detailed design iterations to evidence avoidance and minimisation measures Pre-clearing and clearing surveys Clearing and Land Disturbance Permit Clearing and Land Disturbance Register Audits in line with CEMP Spatial datasets	At completion of DDR Throughout clearing and at completion of clearing works Throughout construction Audit timing per CEMP	Environment and Sustainability Manager at completion of DDR and throughout construction	Design iterations do not show avoidance and minimisation measures DDR does not show biodiversity constraints mapping DDR does not show retention of shrub and groundcover vegetation within the ECZ, HCZ and HTZ Vegetation clearing not undertaken per App B VCP Spatial datasets incomplete or missing information	Update design prior to progressing to AFC Surveyors to undertake additional mapping Design revisions will be kept in a register outlining revision number, dates and description of revisions made. Non-compliances managed per CEMP	Section 7.6 Appendix B: Vegetation Clearing Procedures Section 3.4.5 of the CEMP – Environmental control maps

Aspect	Ref UM #	Commitment	How Addressed	Location	Threatened Species Applicable	Timing (Project Phase)	Responsibility	Performance Indicator	Monitoring Method	Monitoring Timing and Frequency	Reporting (to who and when)	Trigger for action	Response & adaptive management (corrective action)	Document Reference
		groundwater dependent ecosystems (GDEs), aquatic habitats and supporting aquifers). Clearing will be undertaken in accordance with the Vegetation Clearing Memo and where practicable will conserve mid and ground story vegetation in the ECZ and HTZ. Vegetation clearing methods in areas of threatened groundcovers (e.g. orchids) may require a bespoke approach.												
Protected areas and conservation lands	B2	Design and micro-siting of Project infrastructure including transmission line structure benches and access tracks will avoid and/or minimise impacts within protected areas (i.e. nature refuges) and conservation lands (i.e. established BioBank and Biodiversity Stewardship sites and Conservation Agreement sites) occurring within the project footprint.	During detailed design, opportunities to site items in locations where impacts to matters of biodiversity conservation significance are avoided and reduced will occur. Management and mitigation measures addressing the UMMs relevant to the Project are summarised in Section 7.15 Measures to minimise impacts to biodiversity are detailed in Appendix B: Vegetation Clearing Procedures.	Disturbance footprint	All species	Detailed Design	Design Manager Environment and Sustainability Manager	Project infrastructure and access tracks have been routed in consideration of protected areas and conservation lands.	Review detailed design iterations to evidence access routes have avoided/minimised protected areas and conservation lands	At completion of DDR	Environment and Sustainability Manager at completion of DDR	Design iterations do not show avoidance and minimisation No reductions in clearing area (ha) in protected areas and conservation lands	Update design prior to progressing to AFC Design revisions will be kept in a register outlining revision number, dates and description of revisions made.	Appendix B: Vegetation Clearing Procedures
Biodiversity Management Plan	B3	A Biodiversity Management Plan (BMP) will be prepared in consultation with NSW DCCEEW Environment and Heritage and approved by DPHI prior to construction. The BMP will be prepared by a qualified ecologist and include a plan for implementing, evaluating and reporting on the effectiveness of all mitigation measures outlined in Technical Report 1 – Revised Biodiversity Development Assessment Report (the BDAR), including: Measures to minimise impacts to biodiversity,	This BMP has been prepared by a qualified ecologist and consultation with BCS and approval by DPHI will occur prior to construction. Management and mitigation measures addressing the UMMs relevant to the Project are summarised in Section 7.15	All of Project	All species	Preconstruction Construction	Environment and Sustainability Manager Construction Manager Supervisor Engineer Site Environmental Advisor	Approved BMP available prior to works commencing Approved BMP being implemented with detailed mitigation actions for the project for all biodiversity. Procedure detailed in BMP and appendices P occurring per BMP	Weekly Environmental Inspections BMP Internal and External Audits BMP Monitoring Program	Weekly Audit timing per CEMP Monitoring per Appendix H: Flora and Fauna Monitoring Program	Environment and Sustainability Manager Audit results and reporting per CEMP Monitoring reports to Transgrid per Appendix H: Flora and Fauna Monitoring Program Throughout pre-construction and construction	Measures identified in BMP are not being implemented Noncompliance identified in audits undertaken Triggers per Appendix H: Flora and Fauna Monitoring Program	Implement inspection and audit corrective actions Corrective actions per BMP Monitoring Program	This BMP Appendix A: Unexpected Species Finds Protocol Appendix B: Vegetation Clearing Procedures Appendix C: Fauna Handling and Rescue Procedures Appendix D: Biosecurity Management Plan

Aspect	Ref UM M #	Commitment	How Addressed	Location	Threatened Species Applicable	Timing (Project Phase)	Responsibilit y	Performance Indicator	Monitoring Method	Monitoring Timing and Frequency	Reporting (to who and when)	Trigger for action	Response & adaptive managemen t (corrective action)	Document Reference
		including measures to reduce disturbance to sensitive flora and fauna procedures for clearing of vegetation, including pre-clearing inspections and procedures for the relocation of flora and fauna. - Preparation of a fauna handling and rescue procedure to be implemented during construction and operation for the ethical handling of injured or displaced fauna. Further, the fauna handling and rescue procedure would include an incident reporting protocol for fauna relocations, rescue and rehabilitation, euthanasia and/or fatality. - Procedures for the demarcation and protection of retained vegetation, including vegetation adjacent to construction areas and during weed management. - Vegetation clearing procedures for a two staged habitat removal process required for removal of key habitat features (hollow-bearing trees, habitat trees, and bush rock) identified in the Technical Report 1 – Revised Biodiversity Development Assessment Report (the BDAR) and/or pre-clearing inspection. Including procedures to record the effort and outcomes of the habitat removal process. - Retention of habitat features such as rocky outcrops, surface rock, dead wood, logs, wherever practicable. - Proposed rehabilitation of temporary disturbance areas including management and maintenance measures. - Unexpected species finds protocol to be implemented if threatened ecological communities, flora and fauna species, not	A fauna handling, rescue and relocation procedure including nest management is included in Appendix C: Fauna Handling and Rescue Procedures. Vegetation clearing procedures, including a two-staged habitat removal process, procedures for the demarcation and protection of retained vegetation and measures to minimise impacts to biodiversity are included in Appendix B: Vegetation Clearing Procedures. Habitat salvage, retention and reuse measures are provided in Appendix E: Supplementary Hollow and Nest Strategy. An unexpected finds protocol is provided in Appendix A: Unexpected Species Finds Protocol Biosecurity protocols are provided in Appendix D: Biosecurity Management Plan. Rehabilitation of temporary disturbance is detailed in Section 7.12. Compliance management											Appendix E: Supplementary Hollow and Nest Strategy Appendix H: Flora and Fauna Monitoring Program

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		assessed in Technical Report 1 – Revised Biodiversity Development Assessment Report (the BDAR), are encountered during pre-clearing inspections. • A description of biosecurity protocols for plant and equipment movement between sites, including species specific measures. • Education of construction teams regarding the presence of native fauna and risks of vehicle collision, particularly early in the morning and late in the afternoon/at night; implementation of speed limits on sealed and unsealed tracks and roads. • Outline monitoring and compliance management requirements. • Approach to relocation of nests by suitably qualified ecologist where found within construction work sites (i.e. nests found in hazardous areas will be translocated to nearby safe areas, direct handling of eggs and chicks will be avoided where possible). This could include potentially new poles/nest platforms. • Details on the pre-clearing and clearing supervision process. • Procedures for consultation with DPI Fisheries and pre-construction survey (where required) for threatened aquatic species should be established (and Commonwealth DCCEEW for Riek's Crayfish, as required), along with processes for reporting and consideration of recommendations into design and construction methods, as relevant. • Procedures for reporting the outcomes of pre-	including a monitoring program and adaptive management measures are detailed in Appendix H: Flora and Fauna Monitoring Program.. Procedures for pre-construction aquatic biodiversity surveys are included in Section 7.6. Vehicle Collision risk training included in Section 8.2											

Aspect	Ref UM M #	Commitment	How Addressed	Location	Threatened Species Applicable	Timing (Project Phase)	Responsibilit y	Performance Indicator	Monitoring Method	Monitoring Timing and Frequency	Reporting (to who and when)	Trigger for action	Response & adaptive managemen t (corrective action)	Document Reference
		construction aquatic biodiversity surveys (where required under mitigation measure B33) at CLASS 1 crossing locations (new and upgraded tracks) potentially supporting threatened aquatic species and any management measures to be implemented (e.g. timing construction outside of breeding seasons, crossing type, micro siting). - Procedures for the stockpiling and supply of felled trees for KFH rehabilitation or improvement works, including procedures for consultation with DPI Fisheries. The BMP will include adaptive management measures for uncertain/ indirect/ prescribed impacts and a biodiversity monitoring program. The adaptive management measures would detail procedures for uncertain impacts, risk associated with potential failure of mitigation, circumstances where avoidance may not be achievable and prescribed impacts. The adaptive management measures would be underpinned by monitoring programs, to provide early warning of ineffective measures and/or uncertain impacts occurring. The adaptive management measures would include: - Performance criteria to guide monitoring - Measurable thresholds to identify when remedial action is triggered - Adaptive management response/actions - A trigger for additional credit obligations and/or conservation measures for uncertain, indirect or prescribed impacts, where these impacts cannot be adaptively managed - Reporting requirements. The adaptive management measures and monitoring												

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		program will be developed to target specific species considered to be most at risk of significant impacts, as determined during the detailed design phase. The BMP will stipulate objectives for monitoring, reporting and evaluation, and how baseline data will be captured and represented.												
Supplementary biodiversity survey	B4	Where construction activities are required in areas of native vegetation that have not been previously subject to biodiversity survey, supplementary biodiversity survey will, where possible, be carried out prior to disturbance to inform detailed design and micro-siting opportunities, adherence to clearing limits and biodiversity offsetting requirements. Areas subject to additional survey may include but are not limited to previously inaccessible lands, tracks to access isolated clearing areas and any areas requiring direct impacts outside the existing project footprint. The surveys will be carried out by a suitably qualified person and would incorporate the following at a minimum: - Survey of the area of vegetation to be cleared to determine clearing extent - Vegetation surveys to determine PCTs/TECs and Vegetation Integrity of the areas to be impacted - Survey and map habitat constraints for candidate threatened species to inform presence/absence - Additional targeted surveys to confirm presence/absence of candidate flora and fauna species conservatively assumed present. - Adaptive management measures in the BMP will outline appropriate response actions to be implemented in the event that additional	Should changes to the Project's design or construction methodology or additional field surveys result in changed impacts to biodiversity that have not been included in the Revised BDAR, these would be assessed in accordance with the requirements of the BAM by an accredited assessor. Details in relation to changed impacts that would be assessed in accordance with the requirements of the BAM are provided in Section 7.4. Requirements for supplementary biodiversity survey are detailed in Section 7.2 Management and mitigation measures addressing the UMM relevant to the Project are summarised in Section 7.15	Outside project disturbance footprint	All species	Pre-construction Construction	Design Manager Environment and Sustainability Manager Construction Manager Transgrid	Works undertaken outside the disturbance footprint are approved via Consistency Assessment and BAM Assessment	Consistency Assessment BAM Assessment Supplementary Biodiversity Strategy (SBS) (Transgrid) Biodiversity Verification Assessment Report (BVAR) (Transgrid)	As required	Environment and Sustainability Manager Transgrid Throughout pre-construction and construction	Works conducted outside the Project footprint and biodiversity impacted without CA and BAM Assessment SBS and BVAR not undertaken	Implement corrective actions in consultation with Transgrid	Section 7.2 Section 7.4

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		biodiversity constraints are identified. An assessment of the likelihood of additional indirect and prescribed impacts as a result of additional clearing and disturbance to be undertaken prior to clearing. Future survey requirements and processes for reporting and consideration of recommendations into design and construction methods, as relevant, will be included in the BMP (mitigation measure B3).												
Supplementary Biodiversity Assessment Strategy	B5	A Supplementary Biodiversity Assessment Strategy (SBAS) will be prepared and implemented by Transgrid with the primary purpose of credit liability reduction. The SBAS will be prepared in consultation with NSW DCCEEW Environment and Heritage and will include but is not limited to: - Target species, approach and timing of post Technical Report 1 – Revised Biodiversity Development Assessment Report biodiversity surveys. Results will be used for design and construction avoidance (where possible) plus validation of assumed presence where a credit liability reduction is proposed. - Method for validation of PCTs/TECs assumed present on previously inaccessible land where surrogate, duplicate or benchmark plots were used and low confidence of PCT allocation or condition. - Monitoring, and periodic reporting of final areas of impact and application for credit liability reduction. - Approach for any newly identified PCTs/candidate species. - A trigger for additional credit obligations and/or conservation measures for uncertain, indirect or prescribed impacts, where these impacts	Requirements for the development of a Supplementary Biodiversity Assessment Strategy (SBAS) are detailed in Section 7.2	All of Project	All species	Preconstruction Construction	Transgrid	SBS undertaken per Section 7.2	SBS Submission per Section 7.2	Monitoring per Section 7.2	Reporting per Section 7.2	SBS not undertaken	SBS to be undertaken Corrective actions to be managed by Transgrid	Section 7.2 Transgrid Supplementary Biodiversity Assessment Strategy

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		cannot be adaptively managed.												
SAIs	B6	The design and construction methodology for the project must identify additional avoidance and minimisation measures to further reduce impacts to entities which are likely to have a serious and irreversible impact to the greatest extent practicable. Opportunities for intact and/or higher condition remnants should be prioritised for avoidance incorporating consideration of connectivity between retained remnants within and adjacent to the project footprint must be considered in the connectivity strategy.	During detailed design and construction, opportunities to minimise and avoid impacts to Serious and Irreversible Impacts (SAIs) will occur. Management and mitigation measures addressing the UMMs relevant to the Project are summarised in Section 7.15 Measures to minimise impacts to SAI are included in Appendix B: Vegetation Clearing Procedures. Measures to prioritise intact and/or higher condition remnants with consideration to connectivity are addressed in Appendix F: Connectivity Strategy	Disturbance footprint	All species	Detailed Design Pre construction Construction	Design Manager Environment and Sustainability Manager Ecologist Construction Manager	Impacts to SAI are avoided and minimised through detailed design (Micrositing, biodiversity constraints mapping) Vegetation clearing undertaken per with App B VCP Connectivity considered in detailed design	Review detailed design iterations to evidence avoidance and minimisation measures for SAI and connectivity measures Pre-clearing and clearing surveys Pre-clearing Reports Post-clearing Reports Audits in line with CEMP	At completion of DDR Throughout clearing and at completion of clearing works Audit timing per CEMP	Environment and Sustainability Manager Transgrid At completion of DDR and throughout construction	Design iterations do not show avoidance and minimisation or measures to retain connectivity DDR does not show biodiversity constraints mapping DDR does not show retention of connectivity corridors DDR does not show habitat tree exclusion zones. Vegetation clearing not undertaken per App B VCP	Update design prior to progressing to AFC Design revisions will be kept in a register outlining revision number, dates and description of revisions made. Non-compliances managed per CEMP	Section 7.15 Appendix B: Vegetation Clearing Procedures. Appendix F: Connectivity Strategy
SAIs	B7	Additional and Appropriate Measures (compensatory measures) are to be implemented by Transgrid where impacts to likely SAIs cannot be further reduced and/ or where likely SAI risks remain. Compensatory measures will be developed and delivered in consultation with the NSW DCCEEW Environment and Heritage and incorporate and/or support the long-term augmentation, enhancement and protection of native vegetation and/or habitat of the target entity within landscapes local to the impact.	During detailed design and construction, opportunities to minimise and avoid impacts to SAIs in mapped locations where SAI candidate species are considered likely to result in SAI will occur. Management and mitigation measures addressing the UMMs relevant to the Project are summarised in Section 7.15	Disturbance footprint	All species	Detailed Design Pre construction Construction	Design Manager Environment and Sustainability Manager Ecologist Construction Manager	Impacts to SAI are avoided and minimised evidenced through detailed design (Micrositing, biodiversity constraints mapping) Vegetation clearing undertaken per with App B VCP	Review detailed design iterations to evidence avoidance and minimisation measures and connectivity measures Pre-clearing and clearing surveys Pre-clearing Survey Reports Post-clearing Reports Clearing and Land Disturbance Permit Clearing and Land Disturbance Register Audits in line with CEMP	At completion of DDR Throughout clearing and at completion of clearing works Audit timing per CEMP	Environment and Sustainability Manager Transgrid At completion of DDR and throughout construction	Design iterations do not show avoidance and minimisation measures to SAI DDR does not show biodiversity constraints mapping Vegetation clearing not undertaken per App B VCP	Update design prior to progressing to AFC Design revisions will be kept in a register outlining revision number, dates and description of revisions made. Non-compliances managed per CEMP	Section 7.15 Appendix B: Vegetation Clearing Procedures. Section 7,4

Aspect	Ref UM M #	Commitment	How Addressed	Location	Threatened Species Applicable	Timing (Project Phase)	Responsibilit y	Performance Indicator	Monitoring Method	Monitoring Timing and Frequency	Reporting (to who and when)	Trigger for action	Response & adaptive managemen t (corrective action)	Document Reference
			Measures to minimise impacts to SAIL are included in Appendix B: Vegetation Clearing Procedures. Any additional and appropriate measures identified in 'AAM - HumeLink's SAIL - letter to BCD - September 2024_FINAL_v 1' and consultation required will be addressed and implemented by Transgrid.											
Threatened frogs: Booroolong Frog, Sloane's Froglet, Stuttering Frog and Yellow-spotted Tree Frog	B8	Where threatened frog (including Booroolong Frog) habitats have been identified the following avoidance measures will be implemented, where practicable: - Avoid installing waterway crossings. - Avoid disturbance within 50 m of the top of bank of the waterway (including riparian vegetation). Where avoidance is not possible: - Waterway crossing designs should avoid instream structures to minimise the potential for hydrological change, erosion and sedimentation impacts of downstream environments. - Location of waterway crossings will be determined in consultation with a suitably qualified Ecologist to avoid or minimise impacts to potential habitats or ecological features. - Develop site specific erosion and sedimentation control plans to ensure the potential for erosion and sedimentation impacts are minimized as far as	Avoidance measures will be implemented where practicable for threatened frog habitats. Detailed design will consider the location and crossing design to minimise and avoid impacts where possible. Management and mitigation measures addressing the UMM relevant to the Project are summarised in Section 7.15 Threatened frog monitoring per Appendix H: Flora and Fauna Monitoring Program Measures for clearing procedures in identified threatened frog habitats are included in Appendix B:	Disturbance footprint	Threatened frog species	Detailed Design Pre construction Construction (until site stabilisation is achieved)	Design Manager Environment and Sustainability Manager Ecologist Construction Manager	Impacts to threatened frog habitats avoided and minimised through detailed design (Micrositing, biodiversity constraints mapping) Threatened frog monitoring undertaken Vegetation clearing undertaken per Appendix B: Vegetation Clearing Procedures Mitigation measures identified in the SWMP are implemented Runoff and sediment transfer from the project area during construction is controlled Protection of aquatic habitat Biosecurity management measures implemented	Review detailed design iterations to evidence avoidance and minimisation measures and connectivity measures Threatened Frog Monitoring per Appendix H: Flora and Fauna Monitoring Program Pre and Post Rainfall Inspection Checklists Environmental Audits Weekly Inspections Pre-clearing and clearing supervision Pre-clearing and post clearing survey reports Clearing and Land Disturbance Permit Clearing and Land Disturbance Register	At completion of DDR Throughout construction Monitoring per Appendix H: Flora and Fauna Monitoring Program	Environment and Sustainability Manager Transgrid At completion of DDR and throughout construction	Design iterations do not show avoidance and minimisation measures threatened frog habitats DDR does not show avoidance and minimisation measures for waterway crossings Vegetation clearing managed per Appendix B: Vegetation Clearing Procedures Triggers detailed in Appendix D: Biosecurity Management Plan Controls identified in the SWMP / Erosion and Sediment Control Plans not installed/ not functioning Signs of visible erosion Evidence of notable erosion	Update design prior to progressing to AFC Design revisions will be kept in a register outlining revision number, dates and description of revisions made. Non-compliances managed per CEMP Review the SWMP updated as required Corrective actions identified from Incident investigation process Corrective actions per Appendix D: Biosecurity Management Plan Corrective actions per Appendix H: Flora and	Section 7.15 Section 8.3 Appendix B: Vegetation Clearing Procedures Appendix D: Biosecurity Management Plan Appendix H: Flora and Fauna Monitoring Program SWMP

Aspect	Ref UM M #	Commitment	How Addressed	Location	Threatened Species Applicable	Timing (Project Phase)	Responsibilit y	Performance Indicator	Monitoring Method	Monitoring Timing and Frequency	Reporting (to who and when)	Trigger for action	Response & adaptive managemen t (corrective action)	Document Reference
		practicable, including monitoring the success of erosion and sediment control measures. Develop and implement site-specific hygiene protocols (e.g. cleaning of plant machinery), to minimise the spread of pathogens and exotic weeds during and post-construction (in line with Hygiene protocols for the control of diseases in Australian frogs [DCCEEW, 2011]). A suitably qualified ecologist will be engaged to undertake site specific monitoring surveys for the species at the proposed creek crossing sites within and adjacent to the species habitat as well as downstream receiving environments that may be subject to potential indirect impacts. The BMP (refer to mitigation measure B3) will incorporate a monitoring program for threatened frogs to be implemented during construction.	Vegetation Clearing Procedures. Site-specific hygiene protocols for construction are provided in Appendix D: Biosecurity Management Plan. Soil and water quality management measures will be implemented in accordance with the Soil and Water Management Plan to minimise erosion during clearing. An Erosion and Sediment Control Strategy has been provided in Appendix D of the Soil and Water Management Plan.									or sedimentation, particularly beyond the project boundary or into sensitive areas Raise Environmental Incident Triggers per Appendix H: Flora and Fauna Monitoring Program	Fauna Monitoring Program	
Threatened insects: Golden Sun Moth and Key's Matchstick Grasshopper	B9	The detailed design will consider opportunities to avoid and minimise impacts to Golden Sun Moth and Key's Matchstick Grasshopper within transmission line easements to be implemented during construction. As a part of the BMP (refer to mitigation measure B3), a rehabilitation plan would be developed for threatened insect habitat temporarily disturbed during construction. Planting specifications and requirements for post-care, including weed control, are to be outlined in the plan and would be subject to agreement of the relevant landowner.	Detailed design and construction opportunities to minimise and avoid impacts to Golden Sun Moth and Key's Matchstick Grasshopper within transmission lines will be implemented. Management and mitigation measures addressing the UMM relevant to the Project are summarised in Section 7.15 A rehabilitation plan for threatened insect habitat temporarily disturbed during	Disturbance footprint	Golden Sun Moth and Key's Matchstick Grasshopper	Detailed Design Pre construction Construction	Design Manager Environment and Sustainability Manager Ecologist Construction Manager Supervisor	Impacts to threatened insect habitat are avoided and minimised through detailed design within transmission line easements Rehabilitation undertaken in accordance with Appendix G: Threatened Insect Habitat Rehabilitation Plan Performance indicators per Appendix H: Flora and Fauna Monitoring Program	Review detailed design iterations to evidence avoidance and minimisation measures Rehabilitation Monitoring per Appendix H: Flora and Fauna Monitoring Program	At completion of DDR Throughout clearing and at completion of clearing works Monitoring per Appendix H: Flora and Fauna Monitoring Program	Environment and Sustainability Manager at completion of DDR and throughout construction Transgrid Throughout pre-construction and construction	Design iterations do not show avoidance and minimisation Rehabilitation not undertaken per Appendix G: Threatened Insect Habitat Rehabilitation Plan Triggers for rehabilitation per Appendix H: Flora and Fauna Monitoring Program	Update design prior to progressing to AFC Design revisions will be kept in a register outlining revision number, dates and description of revisions made. Corrective actions per Appendix H: Flora and Fauna Monitoring Program	Section 7.15 Appendix G: Threatened Insect Habitat Rehabilitation Plan Appendix H: Flora and Fauna Monitoring Program

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			construction is provided as Appendix G: Threatened Insect Habitat Rehabilitation Plan. Monitoring will be undertaken per Appendix H: Flora and Fauna Monitoring Program											
Connectivity strategy	B10	As a part of the BMP (refer to mitigation measure B3), a Connectivity Strategy will be developed in consultation with NSW DCCEEW Environment and Heritage. The core objectives of the strategy will be to outline the final locations of the proposed mitigation measures identified within Technical Report 1 – Revised Biodiversity Development Assessment Report. The Connectivity Strategy will be implemented to maintain connectivity in areas identified as facilitating fauna movement. Consideration of connectivity corridors will occur as a minimum at: - Key riparian crossings. - Areas of the transmission line joining proposed biodiversity stewardship sites (i.e. Donna Valley Biodiversity Stewardship Site) and or conservation reserve estate (i.e. Tarlo River National Park, Bango Nature Reserve, Mudjarn Nature Reserve and Minjary National Park). - Transmission line structure locations that occur in woodland vegetation at strategic locations (i.e. vegetation corridors with moderate to high landscape connectivity, and with moderate to high levels of fauna activity/ movement). The final locations of connectivity corridors and minimum width requirements will be identified. Access tracks will avoid connectivity corridors and favour existing	Appendix F: Connectivity Strategy identifies a series of connectivity corridors that would be established at key locations and consideration of connectivity measures. Management and mitigation measures addressing the UMM relevant to the Project are summarised in Section 7.15 Glider pol monitoring will be undertaken in accordance with Appendix H: Flora and Fauna Monitoring Program	All Project	All fauna species	Detailed Design Pre construction Construction	Design Manager Environment and Sustainability Manager Ecologist Construction Manager	Connectivity corridors considered in detailed design Access tracks considered connectivity in detailed design and construction works Performance indicators per Appendix H: Flora and Fauna Monitoring Program	Review detailed design iterations to evidence connectivity measures Connectivity Corridor Validation Report Glider Pole Monitoring per Appendix H: Flora and Fauna Monitoring Program	At completion of DDR Connectivity Corridor Validation Report per Appendix F: Connectivity Strategy Monitoring per Appendix H: Flora and Fauna Monitoring Program	Environment and Sustainability Manager at completion of DDR and throughout construction Transgrid	Design iterations do not show connectivity corridor consideration and retention Connectivity measures not implemented during construction Triggers per Appendix H: Flora and Fauna Monitoring Program	Update design prior to progressing to AFC Design revisions will be kept in a register outlining revision number, dates and description of revisions made. Non-compliances managed per CEMP Corrective actions per Appendix H: Flora and Fauna Monitoring Program	Appendix F: Connectivity Strategy Appendix H: Flora and Fauna Monitoring Program Section 7.15

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		access wherever possible. Construction will avoid and minimise any disturbance of connectivity corridors, where practicable. Connectivity measures such as fauna sensitive structures (i.e. under transmission glider poles), vegetation stepping stones, or reduced clearing will be considered. Glider connectivity opportunities will be considered in at least six locations within the project footprint that align with glider corridors and opportunities identified in the glider memo (Niche, 2023).												
Collision risk and Bird-strike	B11	Conductor line-marking techniques will be considered at specific locations identified in Technical Report 1 – Revised Biodiversity Development Assessment Report during design refinement to minimise bird strikes. Use of fauna deterrent devices, most likely consisting of the “flapper” variety, will be considered. Positioning and exact diverter model will also be considered during detailed design and will be developed as part of the project design. At a minimum, these will be used at sites recommended for specific corridors (refer to <i>Technical Report 1 – Revised Biodiversity Development Assessment Report</i> , Attachment 24) where flapper devices are considered warranted based on distribution, and nature of avifauna records, and nearby suitable waterbird habitat (within 1 km). Fauna deterrent methods proposed are outlined in the Connectivity Strategy.	Location, positioning and diverter model for conductor line-marking has been developed to minimise bird strikes detailed in Section 7.13 Management and mitigation measures addressing the UMM relevant to the Project are summarised in Section 7.15	All Project	Bird and Bat species	Detailed Design Preconstruction Construction	Design Manager Environment and Sustainability Manager Ecologist Construction Manager	Detailed design includes positioning and exact fauna diverter model at required sites	Review detailed design iterations to evidence bird deterrent measures	At completion of DDR	Environment and Sustainability Manager at completion of DDR and throughout construction	Bird deterrent devices not considered in detailed design	Update design prior to progressing to AFC Design revisions will be kept in a register outlining revision number, dates and description of revisions made. Non-compliances managed per CEMP	Section 7.13 Section 7.15
Supplementary Hollow and Nest Strategy	B12	Develop and implement a Supplementary Hollow and Nest Strategy to provide alternative roosting and/or nesting habitat for threatened fauna displaced during clearing. The strategy should address measures such as nest boxes, hollow re-use/creation, re-use of timber/logs as habitat within the transmission line easement where practicable. The strategy would be captured in the BMP (as per	Alternative roosting/nesting habitat measures including installation, maintenance and monitoring are detailed in Appendix E: Supplementary Hollow and Nest Strategy. Any alternative roosting and/or	Disturbance footprint	Hollow and nest dependent species	Preconstruction Construction	Environment and Sustainability Manager Ecologist Construction Manager	Presence of tree hollow habitat within the disturbance area identified per Appendix B: Vegetation Clearing Procedures Installation of artificial hollows per Appendix E: Supplementary	Preclearing and clearing supervision Preclearing and post clearing Reports Clearing and Land Disturbance Permit Clearing and Land Disturbance Register	Before clearing commencement During and post clearing works Post-installation of artificial hollows Monitoring per Appendix H: Flora and	Environment and Sustainability Manager Transgrid Throughout pre-construction and construction Reporting per Appendix H: Flora and Fauna Monitoring Program	No preclearance checks undertaken. Stage clearing procedure not followed. Injured native fauna/ hollow dependent fauna form clearing process.	Review the vegetation clearing plan, updated as required Corrective actions from Incident investigation process Corrective actions and maintenance per Appendix	Section 7.15 Appendix E: Supplementary Hollow and Nest Strategy Appendix B: Vegetation Clearing Procedures). Appendix H: Flora and Fauna Monitoring Program

Aspect	Ref UM M #	Commitment	How Addressed	Location	Threatened Species Applicable	Timing (Project Phase)	Responsibilit y	Performance Indicator	Monitoring Method	Monitoring Timing and Frequency	Reporting (to who and when)	Trigger for action	Response & adaptive managemen t (corrective action)	Document Reference
		mitigation measure B3) and will address the following requirements: - Nest boxes and other supplementary measures (such as hollow hogs) to be installed as close to the cleared area as possible (subject to landowner agreement and suitable trees being present) - Survey of tree hollows and nests within the proposed clearing extents. - Identify the target species, size, type, number and suitable location of nest boxes/hollows required based on the results of the ecological surveys and active hollow resources in adjacent areas. - The installation of appropriate nest boxes or hollow replacements will be undertaken as early as practicable prior to clearing activities to prevent the use of the nest boxes or hollow replacements by invasive or non-targeted species. - Nest boxes can also include the re-use of existing hollows salvaged prior to or during clearing where practicable. - Record the type, height, orientation and location of nest boxes installed and provide as spatial data to Transgrid. - An annual monitoring program to assess the efficacy of supplementary habitat measures throughout the construction phase. - Post construction monitoring and replacement of damaged nest boxes will form part of discussions with individual landowners.	nesting habitat required will be installed as close to the cleared area as possible, subject to access and landowner agreement, and as early as practicable prior to clearing activities. Management and mitigation measures addressing the UMM relevant to the Project are summarised in Section 7.15 The presence of tree hollow habitat within the disturbance area will be confirmed during pre-clearing surveys as detailed in Appendix B: Vegetation Clearing Procedures. Monitoring and maintenance of artificial hollows is detailed in Appendix H: Flora and Fauna Monitoring Program					Hollow and Nest Strategy Performance indicators per Appendix H: Flora and Fauna Monitoring Program	Incidents managed per CEMP	Fauna Monitoring Program		Lack of Environmental Incident notification where required Triggers per Appendix H: Flora and Fauna Monitoring Program	H: Flora and Fauna Monitoring Program	
Biodiversity exclusion zones	B13	Biodiversity exclusion zones for retained vegetation and threatened species habitats will be confirmed by a suitably qualified ecologist and identified as 'No	Biodiversity exclusion zone identification and management measures are detailed in	Disturbance footprint	All species	Pre-construction Construction	Surveyor Environment and Sustainability Manager	Project boundary and exclusion zones are accurately installed	ECMs display exclusion zones and clearing limits	Iteratively, throughout detailed design and, pre-construction	Environment and Sustainability Manager Transgrid	Boundary demarcated identified as incorrect Over clearing incident	Corrective actions identified per incident process	Section 7.15 Appendix B: Vegetation Clearing Procedures

Aspect	Ref UMM #	Commitment	How Addressed	Location	Threatened Species Applicable	Timing (Project Phase)	Responsibility	Performance Indicator	Monitoring Method	Monitoring Timing and Frequency	Reporting (to who and when)	Trigger for action	Response & adaptive management (corrective action)	Document Reference
		disturbance' zones prior to the commencement of clearing or any site activity that could damage the vegetation within the exclusion zone. These areas will be identified as a no-go zone within approved plans and on-site demarcation will be required. High visibility protection fencing will be erected on site including signage clearly identifying these areas as no-go zones. Requirements for the protection and management of no-go zones will be addressed as a part of the site induction. Biodiversity exclusion zones will be physically marked and demarcated and included on sensitive area maps and project GIS/GPS systems, prior to clearing.	Appendix B: Vegetation Clearing Procedures. Management and mitigation measures addressing the UMM relevant to the Project are summarised in Section 7.15				Construction Manager Supervisor	No over clearing incidents	Pre-clearance surveys and Reports Post-clearing Reports Surveyors to capture "as-built" data for all cleared areas	and construction	Throughout pre-construction and construction	Incidents managed per CEMP	Re-survey exclusion zones and project boundary Reinstall exclusion zone fencing/flagging and signage Retrain staff as necessary	
Biodiversity management training	B14	All relevant project personnel involved in vegetation clearance, including relevant sub-contractors, will be trained on biodiversity management protocols and the requirements for the project, through inductions, toolbox talks and targeted training, and provided with sensitive area maps (showing clearing boundaries and exclusion zones) and updates as required.	Training will be carried out by the site inductions, toolbox training and targeted training. Section 8.2 provide information in relation to the training and awareness that will be provided to all site personnel. Sensitive areas (i.e. spatial locations that contain any protected biodiversity matters identified in the Revised BDAR) for the relevant works locations will be covered in the training, with GIS or environmental control plans provided to relevant personnel within the construction workforce Vegetation clearing	All Project	All species	Preconstruction Construction	Environment and Sustainability Manager HSEQ Manager	100% staff trained through Project Induction 100% Site-specific training undertaken for specific works	Training Records ECMS developed iteratively and updated throughout works	Consistently throughout preconstruction and construction	Environment and Sustainability Manager HSEQ Manager Project Manager Throughout pre-construction and construction	Training not undertaken for Project Staff as identified in Project Records Incidents occur on site	Environmental awareness training and incorporate into toolbox talks. Additional training undertaken for Project Staff	Section 8.2 Section 3.6 of the CEMP Appendix B: Vegetation Clearing Procedures

Aspect	Ref UMM #	Commitment	How Addressed	Location	Threatened Species Applicable	Timing (Project Phase)	Responsibility	Performance Indicator	Monitoring Method	Monitoring Timing and Frequency	Reporting (to who and when)	Trigger for action	Response & adaptive management (corrective action)	Document Reference
			procedures including training requirements are detailed in Appendix B: Vegetation Clearing Procedures.											
Features of high biodiversity conservation significance	B15	Features of high biodiversity conservation significance within the operational easement, including biodiversity exclusion zones identified during construction and retained habitat for threatened species, will be recorded in Transgrid's GIS. The GIS information will be reviewed during the planning of all maintenance or other future activities that could cause disturbance.	All GIS data of high biodiversity significance will be provided to Transgrid to inform operational phase management and future activities. Management and mitigation measures addressing the UMM relevant to the Project are summarised in Section 7.15 The operational phase of the Project is not addressed by this BMP. Transgrid will prepare a separate Biodiversity EMP Sub-plan that addresses the operational phase of the Project.	All Project	All Species	Preconstruction Construction	Environment and Sustainability Manager	100% GIS spatial data provided to Transgrid to inform operational phase management and future activities.	Surveyors to capture "as-built" data Project Ecologist to capture spatial data as part of works	Throughout pre construction and construction	Environment and Sustainability Manager Transgrid Throughout pre-construction and construction	Spatial datasets not complete Gaps identified in spatial data	Re-survey exclusion zones, clearing zones and project boundary	Section 7.15 Transgrid GIS Platform
Vegetation clearing and maintenance	B16	Update and implement existing procedures and guidelines for operation and maintenance of the project that address the following: - Vegetation clearing and maintenance commitments in Technical Report 1 – Revised Biodiversity Development Assessment Report (the BDAR) and EIS. - Avoiding access and disturbance in biodiversity exclusion zones identified during the construction. - Avoiding access and disturbance in areas of high biodiversity	The operational phase of the Project is not addressed by this BMP. Transgrid will prepare a separate Biodiversity EMP Sub-plan and/or procedures that address the operational phase of the Project. Management and mitigation measures addressing the	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Section 7.15 Transgrid operational Biodiversity EMP Sub-plan

Aspect	Ref UM M #	Commitment	How Addressed	Location	Threatened Species Applicable	Timing (Project Phase)	Responsibilit y	Performance Indicator	Monitoring Method	Monitoring Timing and Frequency	Reporting (to who and when)	Trigger for action	Response & adaptive managemen t (corrective action)	Document Reference
		conservation significance. Avoiding maintenance of vegetation that does not need to be maintained during operation. Provide training to relevant Transgrid operational workers and vegetation maintenance contractors regarding the operational and maintenance guidelines and procedures.	UMM relevant to the Project are summarised in Section 7.15											
Vegetation clearing	B17	Works for clearing and construction of access tracks will be carried out in such a manner that the least practicable disturbance to actual ground cover and contours is caused. Trees will be removed as close as possible to ground level and root balls will be left in situ wherever practicable. Areas of particular focus for minimising ground disturbance include the following: - Steep or Highly Erodible lands where slopes are in excess of 18 degrees from the horizontal. - Protected Riparian Land (PRL) defined as land within 20 m of the bed or bank of a prescribed stream. Generally, named watercourses are classed as protected riparian land; however, some unnamed watercourses may be classed as protected riparian land. - Waterfront land (40 m from the top of bank). - In areas where large rock outcrops are prevalent on the easement. Hazard trees identified from the LiDAR assessment will be flagged for removal, and any adjacent and important habitat trees and features identified for retention will be clearly marked and included in maps within the CEMP to avoid disturbance during the felling activities.	Shrub or ground stratum native vegetation within areas as defined by UMM B17 would be retained to the greatest extent practicable. Vegetation clearing will be limited to the tree stratum only where possible, with trunk bases also being retained in-situ where feasible as detailed in Appendix B: Vegetation Clearing Procedures. Management and mitigation measures addressing the UMMs relevant to the Project are summarised in Section 7.15	Disturbance footprint	All species	Preconstruction Construction	Environment and Sustainability Manager Construction Manager Supervisor	Vegetation clearing undertaken per Appendix B: Vegetation Clearing Procedures	Pre-clearing Reports Post-clearing Reports Project Ecologist clearing supervision Weekly Inspections Clearing and Land Disturbance Permit Clearing and Land Disturbance Register	Before clearing commences During clearing Post clearing	Environment and Sustainability Manager Transgrid Throughout pre-construction and construction	Clearing not in accordance with Appendix B: Vegetation Clearing Procedures Incidents managed per CEMP	Re-survey exclusion zones, clearing zones and project boundary Corrective actions identified through Incident	Section 7.15 Appendix B: Vegetation Clearing Procedures
Revegetation of disturbed areas	B18	All disturbed lands/areas must be managed throughout the construction work (in	Rehabilitation of temporary disturbance is	Disturbance footprint	All species	Construction	Construction Manager	Rehabilitation undertaken per Section 7.12	Erosion and Sediment Control inspections	Throughout construction	Environment and Sustainability Manager	ESC measures ineffective	Review and update	Section 7.15 Section 7.12

Aspect	Ref UM M #	Commitment	How Addressed	Location	Threatened Species Applicable	Timing (Project Phase)	Responsibilit y	Performance Indicator	Monitoring Method	Monitoring Timing and Frequency	Reporting (to who and when)	Trigger for action	Response & adaptive managemen t (corrective action)	Document Reference
		accordance with the relevant Managing Urban Stormwater (Landcom, 2004) (Blue Book) or comparable best practice guidelines, including: - Vegetation removal, restoration, and management. - Stockpiling, erosion and sediment management. - Stabilisation / rehabilitation of disturbed lands/areas must be undertaken within suitable timeframes. - Temporary erosion and sediment controls must be maintained (and not removed) until rehabilitation measures are providing effective stabilisation of disturbed lands/areas. Disturbed areas (including areas not required for operation) will be stabilised/rehabilitated to a standard either: - As agreed with the landowner. - In accordance with the relevant Managing Urban Stormwater (Blue Book) or comparable best practice guidelines.	detailed in Section 7.12. Monitoring of rehabilitation is detailed in Appendix H: Flora and Fauna Monitoring Program Management and mitigation measures addressing the UMM relevant to the Project are summarised in Section 7.15 Soil and water quality management measures will be implemented in accordance with the Soil and Water Management Plan to minimise erosion during clearing. An Erosion and Sediment Control Strategy has been provided in Appendix D of the Soil and Water Management Plan.				Supervisor Environment and Sustainability Manager	ESC measures in place as per ESCP No visible at-risk areas of erosion or sedimentation No visible turbid water discharge offsite or into sensitive areas Rehabilitation performance indicators per Appendix H: Flora and Fauna Monitoring Program	Weekly Inspections Rehabilitation Monitoring	Weekly Timing and frequency per Appendix H: Flora and Fauna Monitoring Program	Transgrid Throughout construction	Notable erosion or sedimentation Over-capacity or damaged ESC devices Sediment loss Environmental Incident notification Rehabilitation triggers per Appendix H: Flora and Fauna Monitoring Program	ESCPs as needed Environmental awareness training and incorporate into toolbox talks Corrective Actions identified by the incident investigation process Repair, maintain, desilt or upgrade ESC device(s) Corrective actions per Appendix H: Flora and Fauna Monitoring Program	SWMP Appendix H: Flora and Fauna Monitoring Program
Re-use of felled timber	B19	Logs and tree hollows that could provide fauna habitat (the total length of wood at least 10 cm in diameter and at least 0.5 m long) will be relocated to adjacent and/or suitable woodland locations where available/feasible. Opportunities to retain felled trees as habitat on-easement will be considered in select areas (i.e. connectivity corridors and riparian lands). The opportunity to stockpile and supply felled trees for KFH rehabilitation or improvement work will be discussed with DPI Fisheries. Trees within the boundaries of State forests, Crown Lands, Travelling Stock Reserves, public roads or within 40 m of the bank of	Salvage and reuse of microhabitats such as logs, tree hollows, felled trees and root balls is included within Appendix E: Supplementary Hollow and Nest Strategy. Pre-clearing surveys undertaken per Appendix B: Vegetation Clearing Procedures Management and mitigation measures addressing the	Disturbance footprint	All species	Preconstruction Construction	Environment and Sustainability Manager Project Ecologist Construction Manager	Vegetation clearing undertaken per Appendix B: Vegetation Clearing Procedures Habitat salvage and re-use per Appendix E: Supplementary Hollow and Nest Strategy	Pre-clearing Survey Reports Pre-clearing and cleaning supervision Post clearing Survey Reports Weekly inspections	Before clearing commences During clearing works Ongoing (weekly inspections) Rehabilitation works Incidents and non-compliances manager per CEMP	Environmental Sustainability Manager Throughout pre-construction and construction	No preclearance checks undertaken. Stage clearing procedure not followed. Habitat not identified during pre-clearing Habitat features not stored or stored inappropriately Discussions not held with DPI Fisheries	Review the vegetation clearing plan, updated as required Corrective actions from Incident investigation process:	Appendix E: Supplementary Hollow and Nest Strategy Section 7.15

Aspect	Ref UMM #	Commitment	How Addressed	Location	Threatened Species Applicable	Timing (Project Phase)	Responsibility	Performance Indicator	Monitoring Method	Monitoring Timing and Frequency	Reporting (to who and when)	Trigger for action	Response & adaptive management (corrective action)	Document Reference
		any river will be disposed of strictly in accordance with the requirements of the appropriate authorities. These requirements will be determined by the contractors before carrying out such work.	UMM relevant to the Project are summarised in Section 7.15											
Pre-clearing survey	B20	Pre-clearing surveys will be completed prior to clearing at each location by a suitability qualified and experienced ecologist. The proposed clearing extents will be marked out on site prior to the pre-clearing surveys. During the surveys, the ecologist will: - Survey the proposed clearing extent. - Identify any fauna habitat and fauna that will require relocation prior to clearing; document location of any fauna release sites off easement. - Confirm the location and mark out the extents of any biodiversity exclusion zones including locations of unexpected finds (threatened species or threatened species habitat) - Confirm presence of karst roosting habitat for bats within areas identified as high potential karst habitats and develop adaptive safeguards to mitigate indirect impacts to roosting individuals - Confirm that hollow-bearing trees to be retained within and adjacent to the clearing extents are prominently marked/tagged. - Confirm that nest boxes are in place (where required) in suitable locations - Survey and confirm the presence of raptor nests within and adjacent to the clearing extents.	Pre-clearing surveys will be undertaken by an ecologist in accordance with Appendix B: Vegetation Clearing Procedures. Management and mitigation measures addressing the UMM relevant to the Project are summarised in Section 7.15	Disturbance footprint	All species	Pre-construction Construction	Construction Manager Site Supervisor Environment Manager Site Environmental Advisor Project Ecologist	Vegetation clearing undertaken per Appendix B: Vegetation Clearing Procedures	Pre-clearing Survey Reports Pre-clearing and cleaning supervision Post clearing Survey Reports Weekly inspections	Before clearing commences During clearing works Ongoing (weekly inspections) Incidents and non-compliances managed per CEMP	Environment Sustainability Manager Transgrid Throughout pre-construction and construction	No preclearance checks undertaken. Stage clearing procedure not followed. Injured native fauna/ hollow dependent fauna form clearing process. Lack of Environmental Incident notification where required	Review the vegetation clearing plan, updated as required Corrective actions from Incident investigation process Re-survey exclusion zones and project boundary Reinstall exclusion zone fencing/ flagging and signage Retrain staff as necessary	Section 7.15 Appendix B: Vegetation Clearing Procedures
Hazard tree clearing	B21	Opportunities for individually assessing and selectively clearing hazard trees will be considered further during detailed design to minimise impacts. Hazard tree inspections would be	Hazard tree clearing requirements are detailed in Appendix B: Vegetation	Disturbance footprint	All species	Pre-construction Construction	Construction Manager Supervisor Environment and	Vegetation clearing undertaken per Appendix B: Vegetation Clearing Procedures	Pre-clearing Survey Reports Pre-clearing and cleaning supervision	Before clearing commences During clearing works	Environment Sustainability Manager Transgrid	No Hazard tree inspections completed	Review Appendix B: Vegetation Clearing Procedures , updated as required	Section 7.15 Appendix B: Vegetation Clearing Procedures

Aspect	Ref UMM #	Commitment	How Addressed	Location	Threatened Species Applicable	Timing (Project Phase)	Responsibility	Performance Indicator	Monitoring Method	Monitoring Timing and Frequency	Reporting (to who and when)	Trigger for action	Response & adaptive management (corrective action)	Document Reference
		undertaken by an appropriately qualified arborist prior to the commencement of construction in accordance with Transgrid's Maintenance Plan – Easement and Access Tracks.	Clearing Procedures Management and mitigation measures addressing the UMM relevant to the Project are summarised in Section 7.15				Sustainability Manager Ecologist Arborist		Post clearing Survey Reports Weekly inspections Hazard tree inspections	Ongoing (weekly inspections) Incidents and non-compliances managed per CEMP	Throughout pre-construction and construction		Corrective actions from Incident investigation process Retrain staff as necessary	
Biosecurity and hygiene protocols	B22	A Biosecurity Management Plan will be developed as a part of the BMP, to be implemented during construction. The plan will include: - Protocols for the identification of priority weed species, relevant pests and diseases of concern, mandatory reporting obligations and management of Emergency, Control and Biosecurity zones as per the NSW Biosecurity Act 2015. - Weed and pest animal management and monitoring requirements would also be outlined within the plan where relevant. - Inclusion of a Trigger Action Response Plan (TARP) for key biosecurity threats including known biosecurity threats to threatened species and populations. - Locations, timing and methods for removing soil and plant matter from vehicles and machinery and sourcing clean soil and materials free of contaminants for construction work. - Clean down stations (water or air, dependent on the identified biosecurity risk) will be constructed at suitable locations to clean down vehicles and employee shoes to stop the spread of weeds, pathogens (e.g. amphibian chytrid fungus, <i>Phytophthora cinnamomi</i>, exotic rust fungi and Epizootic Haematopoietic Necrosis Virus (EHNV) and the introduction of new	A Biosecurity Plan is provided in Appendix D: Biosecurity Management Plan, which addresses the management of weeds, pests, diseases and their reporting obligations by the Project. Monitoring is detailed in Appendix H: Flora and Fauna Monitoring Program Consultations with relevant agencies and groups involved in pest management for contributions to existing or future pest monitoring and management programs will be managed by Transgrid. Management and mitigation measures addressing the UMM relevant to the Project are summarised in Section 7.15	All Project	All species	Pre-construction Construction	Construction Manager Supervisor Environment and Sustainability Manager Ecologist Arborist	Weeds, pests and pathogens controlled in accordance with Appendix D: Biosecurity Management Plan Monitoring undertaken per Appendix H: Flora and Fauna Monitoring Program	Weed, Pest, Pathogen Monitoring Pre-clearing Surveys	Per Appendix H: Flora and Fauna Monitoring Program	Environment Sustainability Manager Transgrid Throughout pre-construction and construction	Triggers per Appendix D: Biosecurity Management Plan and Appendix H: Flora and Fauna Monitoring Program	Corrective actions per Appendix D: Biosecurity Management Plan and Appendix H: Flora and Fauna Monitoring Program	Section 7.15 Appendix D: Biosecurity Management Plan

Aspect	Ref UM M #	Commitment	How Addressed	Location	Threatened Species Applicable	Timing (Project Phase)	Responsibilit y	Performance Indicator	Monitoring Method	Monitoring Timing and Frequency	Reporting (to who and when)	Trigger for action	Response & adaptive managemen t (corrective action)	Document Reference
		species. The biosecurity plan would address any Property Management Plan requirements where relevant. Phytophthora has been detected in locations associated with the adjoining Snowy 2.0 project and in Lob's Hole (as identified in Appendix C (NSW DCCEEW Environment and Heritage detailed response) of the Submissions Report). If construction vehicles are required to move through areas of known or likely infestation, the risk of spread will be managed through the implementation of suitable hygiene protocols detailed in the Biosecurity Management Plan. Transgrid would consult with relevant agencies and groups involved with pest management in order to contribute to existing or future monitoring and management programs. Consideration of potential contributions would be targeted towards areas where greatest impacts occur, particularly through relatively intact landscapes where easement introduction increases the risk of native fauna predation.												
Biosecurity and hygiene protocols	B23	A weed control strategy would be developed and implemented during the operational stage of the project will be guided by existing Transgrid operational weed management procedures to manage existing or emerging issues.	The operational weed management protocols relate to the operational phase of the Project and Transgrid will prepare a separate Biodiversity EMP Sub-plan and/or procedures that address the operational phase of the Project. A Biosecurity Plan is provided in	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Section 7.15 Transgrid operational weed management procedures Appendix D: Biosecurity Management Plan

Aspect	Ref UMM #	Commitment	How Addressed	Location	Threatened Species Applicable	Timing (Project Phase)	Responsibility	Performance Indicator	Monitoring Method	Monitoring Timing and Frequency	Reporting (to who and when)	Trigger for action	Response & adaptive management (corrective action)	Document Reference
			Appendix D: Biosecurity Management Plan, which addresses the management of weeds, pests, diseases and their reporting obligations by the Project during construction. Management and mitigation measures addressing the UMM relevant to the Project are summarised in Section 7.15											
Light	B24	Directional lighting will be used for any permanent lighting (i.e. substation) or temporary lighting (i.e. worker accommodation) required to minimise light spill as much as possible in accordance with Australian standard AS4282:2019. Artificial lighting required during construction will be directed towards the work site and minimise light spill, to the extent practicable. Permanent lighting will be erected at least 50 m from remnant vegetation where practicable.	Temporary lighting measures will be implemented in accordance with the Noise and Vibration Management Plan. Permanent lighting will be addressed within the detailed design.	All Project	Nocturnal Species	Detailed Design Construction	Design Manager Environment and Sustainability Manager	Light spill is not being directed into vegetation or light spill is sufficiently shrouded from spillage	Review of Detailed Design for lighting design compliance Weekly Inspection	Before DDR finalisation	Design Manager Environment and Sustainability Manager	Light spill is observed shining into vegetation Permanent lighting in design is within 50m of remnant vegetation.	Review lighting design as needed Utilise light shields Reposition lighting away from vegetation	Section 6.3 NVMP
Noise and Vibration (Blasting and crushing)	B25	Prior to blasting and/or crushing activities taking place an ecologist will be engaged to determine potential impacts to Bats, Owls, Cockatoos, Raptors and Superb Parrot. An impact assessment of proposed activities will be completed, and if impacts are likely, appropriate mitigation measures will be proposed. Mitigation measures may include cessation of certain activities, avoiding breeding seasons (where practicable) and/or amending the construction methodology including selecting alternative plant or equipment. Any impact assessments conducted will be provided to NSW DCCEW Environment and Heritage. In the unlikely event that impacts are	There is currently no proposal to undertake blasting and/or crushing activities for the Project. Should the need arise, potential impacts from blasting and/or crushing activities on species listed will be undertaken prior to blasting and/or crushing activities commencing. Impact assessments	All Project wherever blasting and/or crushing activities may be proposed	Bats, Owls, Cockatoos, Raptors and Superb Parrot.	Preconstruction Construction	Construction Manager Environment and Sustainability Manager	Blasting and/or crushing activities are not undertaken If undertaken Blast Management Plan undertaken and Project Ecologist undertakes an impact assessment of proposed activities to determine the potential impacts prior to blasting and/or crushing activities	Blast Management Plan Blast Impact Assessment	Prior to blasting and/or crushing activities	Environment and Sustainability Manager Transgrid NSW DCCEW Environment and Heritage Prior to blasting and/or crushing activities	Blasting and/or crushing activities undertaken without Blast Management Plan and Blast Impact Assessment	Non-compliances and incidents managed per CEMP Corrective actions detailed in non-compliance or incident Impact assessment undertaken Offset requirements reviewed	Section 7.15 Section 7.9. NVMP

Aspect	Ref UMM #	Commitment	How Addressed	Location	Threatened Species Applicable	Timing (Project Phase)	Responsibility	Performance Indicator	Monitoring Method	Monitoring Timing and Frequency	Reporting (to who and when)	Trigger for action	Response & adaptive management (corrective action)	Document Reference
		unavoidable, offsetting requirements will be discussed with NSW DCCEEW Environment and Heritage.	of proposed activities required prior to blasting and/or crushing activities are detailed in Section 7.9. Construction noise and vibration will be managed in accordance with the Noise and Vibration Management Plan. Management and mitigation measures addressing the UMM relevant to the Project are summarised in Section 7.15											
Surface water, soils and groundwater	B26	The key measures proposed to avoid, manage and/or mitigate impacts to surface water, and groundwater and soils will involve: - Preparation of Soil and Water Management Plans (SWMPs) as part of the Construction Environmental Management Plan (CEMP) to manage water quality impacts during construction of the project, including water quality monitoring requirements. - Preparation of Erosion and Sediment Control Plans (ESCPs) by a certified professional in erosion and sediment control - Consideration of appropriately designed scour protection at new stormwater management points. The SWMP will include a combination of the following: - ESCPs - Water quality monitoring requirements - Management of dewatering processes - Emergency Spill Procedure	Soil and water quality management measures will be implemented in accordance with the Soil and Water Management Plan to minimise erosion during clearing. An Erosion and Sediment Control Strategy has been provided in Appendix D of the Soil and Water Management Plan. Management and mitigation measures addressing the UMM relevant to the Project are summarised in Section 7.15	Disturbance footprint	All species	Construction	Construction Manager Supervisor Environment and Sustainability Manager	ESC measures in place as per ESCP No visible at-risk areas of erosion or sedimentation No visible turbid water discharge offsite or into sensitive areas	Erosion and Sediment Control inspections Weekly Inspections	Throughout construction Weekly	Environment and Sustainability Manager Transgrid Throughout construction	ESC measures ineffective Notable erosion or sedimentation Over-capacity or damaged ESC devices Sediment loss Environmental Incident notification	Review and update ESCPs as needed Environmental awareness training and incorporate into toolbox talks Corrective Actions identified by the incident investigation process Repair, maintain, desilt or upgrade ESC device(s)	Section 3.4.6 of the CEMP – Erosion and Sediment Control Plans SWMP Section 7.15

Aspect	Ref UM #	Commitment	How Addressed	Location	Threatened Species Applicable	Timing (Project Phase)	Responsibility	Performance Indicator	Monitoring Method	Monitoring Timing and Frequency	Reporting (to who and when)	Trigger for action	Response & adaptive management (corrective action)	Document Reference
		- Unexpected Contaminants Finds Protocol. ESCPs will be developed for the activities and areas that are considered higher risk. The plans will detail the processes, responsibilities, and measures to manage potential soil and water quality impacts in accordance with the principles and requirements in: - Managing Urban Stormwater – Soils and Construction, Volume 1 (Landcom, 2004) and Volumes 2A (DECC, 2008a) and Volume 2C (DECC, 2008b), commonly referred to as the 'Blue Book'. - Best Practice Erosion and Sediment Control (IECA, 2008) - Controlled activities - Guidelines for instream works on Waterfront Land (DPE Water, 2022b).												
Riparian corridors	B27	To the greatest extent practicable: - Transmission line structures will be located and constructed to minimise impact to vegetated riparian zones (VRZs) - The final transmission line easement will target narrow crossing points of waterways and riparian areas clear of vegetation. - Shrub or ground stratum native vegetation within vegetated riparian zones will be protected to the greatest extent practicable, with vegetation clearing ideally limited to the tree stratum only, with trunk bases being retained in situ. - Where threatened species are known to occur, work methods will avoid or minimise impacts by limiting clearing wherever possible and delineating their habitat outside the final disturbance area as no-go zones.	Transmission line towers will be located and constructed to minimise impacts to vegetated riparian corridors, as defined by "Guidelines for riparian corridors on waterfront land" (DPI – Office of Water, July 2012) as detailed in Appendix B: Vegetation Clearing Procedures. Threatened flora monitoring will be undertaken as per Appendix H: Flora and Fauna Monitoring Program Management and mitigation	Disturbance footprint in riparian zones	All species	Detailed Design Pre construction Construction	Design Manager Environment and Sustainability Manager Ecologist Construction Manager	Transmission line structures are located to avoid and minimise impacts through detailed design Micrositing and biodiversity constraints mapping is used throughout detailed design and evident Vegetation clearing and exclusion zones undertaken per with Appendix B: Vegetation Clearing Procedures. Threatened flora pre-clearing and clearing undertaken per Appendix B: Vegetation Clearing Procedures. Monitoring per Appendix H: Flora and Fauna Monitoring Program	Review detailed design iterations to evidence avoidance and minimisation measures Pre-clearing and clearing surveys Clearing and Land Disturbance Permit Clearing and Land Disturbance Register Monitoring per Appendix H: Flora and Fauna Monitoring Program	At completion of DDR Throughout clearing and at completion of clearing works Monitoring timing and frequency per Appendix H: Flora and Fauna Monitoring Program	Environment and Sustainability Manager Transgrid At completion of DDR and throughout construction	Design iterations do not show avoidance and minimisation No reductions in riparian clearing area (ha). DDR does not show retention of shrub or ground stratum native vegetation within vegetated riparian zones Vegetation clearing not undertaken per App B VCP	Update design prior to progressing to AFC Design revisions will be kept in a register outlining revision number, dates and description of revisions made. Non-compliances managed per CEMP	Section 7.15 Section 7.12 Appendix B: Vegetation Clearing Procedures Appendix F: Connectivity Strategy Monitoring per Appendix H: Flora and Fauna Monitoring Program

Aspect	Ref UMM #	Commitment	How Addressed	Location	Threatened Species Applicable	Timing (Project Phase)	Responsibility	Performance Indicator	Monitoring Method	Monitoring Timing and Frequency	Reporting (to who and when)	Trigger for action	Response & adaptive management (corrective action)	Document Reference
		Work near waterways will be undertaken to avoid impacts such as herbicide drift/overspray, erosion and damage to the banks. Riparian areas subject to disturbance will be progressively stabilised and rehabilitated. Disturbance of bush rock in riparian areas will be avoided wherever practicable.	measures addressing the UMM relevant to the Project are summarised in Section 7.15											
Biodiversity impact avoidance and minimisation	B28	Micro-siting of infrastructure requiring sub-surface work, such as transmission line structure footings and access tracks, will be undertaken as part of the detailed design stage of the Project, to: - Minimise prescribed impacts and impacts to native vegetation, where possible including cut and fill. - Design and micro-siting of new access tracks will seek to avoid or minimise impacts to breeding and sheltering habitat for fauna including, habitat trees and rocky habitats (i.e. rock outcrops, large boulders, piled rock, and rock features that provide potential sheltering - Avoid impacts to groundwater dependent ecosystems (GDEs), aquatic habitats and aquifers - Prioritise restoration of disturbed areas within lands of high biodiversity significance including connectivity corridors, intact vegetation remnants and breeding habitat for fauna, including threatened species and ecological communities). Access track corridors will be established with consideration to terrain to minimise cut/fill and vegetation clearing.	Existing tracks are proposed for use where possible to minimise impacts along the transmission line corridor as detailed in Appendix B: Vegetation Clearing Procedures Management and mitigation measures addressing the UMM relevant to the Project are summarised in Section 7.15 Rehabilitation requirements are detailed in Section 7.12 Rehabilitation monitoring is detailed in Appendix H: Flora and Fauna Monitoring Program	Disturbance footprint	All species	Detailed Design Pre construction Construction	Design Manager Design Manager Environment and Sustainability Manager Ecologist Construction Manager	Infrastructure requiring sub-surface work, such as transmission line structure footings and access tracks are located to avoid and minimise impacts evidenced through detailed design Micrositing and biodiversity constraints mapping is evidenced through detailed design Threatened flora pre-clearing and clearing undertaken per Appendix B: Vegetation Clearing Procedures. Monitoring per Appendix H: Flora and Fauna Monitoring Program	Review detailed design iterations to evidence avoidance and minimisation measures Pre-clearing and clearing surveys Pre-clearing Survey Reports Monitoring per Appendix H: Flora and Fauna Monitoring Program	At completion of DDR Throughout clearing and at completion of clearing works Monitoring timing and frequency per Appendix H: Flora and Fauna Monitoring Program	Environment and Sustainability Manager Transgrid At completion of DDR and throughout construction Monitoring reporting per breeding and sheltering habitat for fauna	Design iterations do not show avoidance and minimisation measures No reductions in clearing area (ha). DDR does not show retention of fauna breeding and sheltering habitat, GDEs, aquatic habitats and aquifers Vegetation clearing not undertaken per App B VCP Triggers per Appendix H: Flora and Fauna Monitoring Program	Update design prior to progressing to AFC Design revisions will be kept in a register outlining revision number, dates and description of revisions made. Non-compliances managed per CEMP Corrective actions per Appendix H: Flora and Fauna Monitoring Program	Section 7.15 Appendix B: Vegetation Clearing Procedures Section 7.12 Appendix H: Flora and Fauna Monitoring Program
Access track construction	B29	Access tracks will be used as necessary for the construction work and as far as is practicable. Track construction will be carried out to cause minimum	The construction and use of access tracks will be undertaken in accordance	Disturbance footprint for access tracks	All species	Construction	Construction Manager Supervisor Environment and	Access Tracks minimised through temporary works	Erosion and Sediment Control inspections Pre and Post Rainfall	Throughout construction Weekly Monitoring per Appendix H: Flora and	Environment and Sustainability Manager Transgrid Reporting per Appendix H:	ESC measures ineffective Controls identified in the SWMP / Erosion and	Review and update ESCPs as needed Review the SWMP	Section 7.15 Section 7.12 Appendix B: Vegetation Clearing Procedures

Aspect	Ref UM M #	Commitment	How Addressed	Location	Threatened Species Applicable	Timing (Project Phase)	Responsibilit y	Performance Indicator	Monitoring Method	Monitoring Timing and Frequency	Reporting (to who and when)	Trigger for action	Response & adaptive managemen t (corrective action)	Document Reference
		disturbance to soil and vegetation both on and adjacent to the track. Tracks will be routed to follow the natural contour of the land as far as practicable to minimise the amount of cut and fill and soil disturbance. For any temporary access tracks, the disturbed surfaces and formed areas will be revegetated in accordance with the approved CEMP or <i>Managing Urban Stormwater: Soils and Construction – Volume 2C Unsealed Roads</i> (DECC, 2008a). In addition, other erosion control mechanisms will be put in place during the initial track construction work to contain any sediment that may erode from the disturbed surfaces.	with this condition as far as practicable. Vegetation clearing procedures for access tracks are detailed in Appendix B: Vegetation Clearing Procedures. Rehabilitation requirements are detailed in Section 7.12 and monitoring in Appendix H: Flora and Fauna Monitoring Program Soil and water quality management measures will be implemented in accordance with the Soil and Water Management Plan to minimise erosion and sedimentation during waterway crossing works. An Erosion and Sediment Control Strategy has been provided in Appendix D of the Soil and Water Management Plan. Management and mitigation measures addressing the UMM relevant to the Project are summarised in Section 7.15				Sustainability Manager Ecologist	ESC measures in place as per ESCP Mitigation measures identified in the SWMP are implemented No visible at-risk areas of erosion or sedimentation Runoff and sediment transfer from the project area during construction is controlled No visible turbid water discharge offsite or into sensitive areas Vegetation clearing and exclusion zones undertaken per with Appendix B: Vegetation Clearing Procedures. Rehabilitation performance indicators in Appendix H: Flora and Fauna Monitoring Program	Inspection Checklists Weekly Inspections Monitoring per Appendix H: Flora and Fauna Monitoring Program Pre-clearing Surveys and Reports Clearing Supervision Post-clearing Reports	Fauna Monitoring Program Throughout pre-clearing and clearing works	Flora and Fauna Monitoring Program Throughout construction	Sediment Control Plans not installed/ not function Evidence of notable erosion or sedimentation, particularly beyond the project boundary or into sensitive areas Notable erosion or sedimentation Over-capacity or damaged ESC devices Sediment loss Environmental Incident notification Vegetation clearing not undertaken per App B VCP Triggers per Appendix H: Flora and Fauna Monitoring Program Non-compliances managed per CEMP	updated as required Environmental awareness training and incorporate into toolbox talks Corrective Actions identified by the incident/non-compliance investigation process Repair, maintain, desilt or upgrade ESC device(s) Corrective actions per Appendix H: Flora and Fauna Monitoring Program	SWMP Appendix H: Flora and Fauna Monitoring Program
Waterway crossing	B30	The following factors will be considered during the detailed design and micro siting process for waterway crossings to	Potential impacts to aquatic environments waterway crossing will be avoided and/or minimised through detailed design, micro-siting, and construction. Requirements for	Disturbance footprint, within riparian land	All species	Detailed Design Construction	Design Manager Environment and Sustainability Manager Construction Manager Project Ecologist	Detailed design evidence micro-siting, avoidance and minimisation processes for	Review detailed design iterations to evidence avoidance and minimisation measures	Throughout construction Weekly Monitoring per Appendix H: Flora and Fauna	Environment and Sustainability Manager Transgrid Reporting per	ESC measures ineffective Controls identified in the SWMP / Erosion and Sediment Control Plans	Design iterations do not show micro-siting, avoidance and minimisation measures for water crossings and connectivity	Section 7.15 Appendix B: Vegetation Clearing

Aspect	Ref UM M #	Commitment	How Addressed	Location	Threatened Species Applicable	Timing (Project Phase)	Responsibilit y	Performance Indicator	Monitoring Method	Monitoring Timing and Frequency	Reporting (to who and when)	Trigger for action	Response & adaptive managemen t (corrective action)	Document Reference
		minimise potential impacts to aquatic environments, wherever practicable: - Any existing crossings will be re-used or upgraded in preference to establishing new crossings. - Disturbance to waterways (bed, banks and associated riparian zones), will be avoided or minimised. - The crossing design and construction work sites will minimise disturbance to any native vegetation, including native instream, fringing, and riparian vegetation within the access track alignment. - Waterway crossings will be constructed perpendicular to the flow of the water and be positioned away from channel bends (where erosive forces are typically greatest). Preferably crossings will be located in straight stream sections with well-defined channel geometries and shallow	crossing in aquatic habitats are detailed in Appendix F: Connectivity Strategy Management of vegetation clearing in waterways is detailed in Appendix B: Vegetation Clearing Procedures Management and mitigation measures addressing the UMM relevant to the Project are summarised in Section 7.15 Soil and water quality management measures will be implemented in accordance with the Soil and Water Management Plan to minimise erosion and sedimentation during waterway crossing works. An Erosion and Sediment Control Strategy has been provided in Appendix D of the Soil and Water Management Plan.					waterway crossings Detailed design includes consideration for crossings in aquatic habitats Access Tracks minimised through temporary works ESC measures in place as per ESCP Mitigation measures identified in the SWMP are implemented Runoff and sediment transfer from the project area during construction is controlled No visible turbid water discharge offsite or into sensitive areas Vegetation clearing undertaken per with Appendix B: Vegetation Clearing Procedures.	Control inspections Erosion and Sediment Control inspections Pre and Post Rainfall Inspection Checklists Weekly Inspections Pre-clearing Surveys and Reports Clearing Supervision Post-clearing Reports	Monitoring Program Throughout pre-clearing and clearing works	Appendix H: Flora and Fauna Monitoring Program Throughout construction	not installed/ not function Evidence of notable erosion or sedimentation, particularly beyond the project boundary or into sensitive areas Notable erosion or sedimentation Over-capacity or damaged ESC devices Sediment loss Environmental Incident notification Vegetation clearing not undertaken per App B VCP compliances managed per CEMP	Update design prior to progressing to AFC Design revisions will be kept in a register outlining revision number, dates and description of revisions made. Review and update ESCPs as needed Review the SWMP updated as required Environmental awareness training and incorporate into toolbox talks Corrective Actions identified by the incident/non-compliance investigation process Repair, maintain, desilt or upgrade ESC device(s)	Procedures Appendix F: Connectivity Strategy SWMP

Aspect	Ref UM M #	Commitment	How Addressed	Location	Threatened Species Applicable	Timing (Project Phase)	Responsibilit y	Performance Indicator	Monitoring Method	Monitoring Timing and Frequency	Reporting (to who and when)	Trigger for action	Response & adaptive managemen t (corrective action)	Document Reference
		stream gradients, in stable dry reaches. Micro-siting will avoid direct and indirect (erosion or sedimentation) impacts to riverine features such as riffles and rapids and sensitive habitat features (i.e. snags, coarse woody debris, instream macrophytes, boulders). Where instream structures are required, considerations to potential flooding and erosive effects will be made in the design and construction of the crossing.												
Waterway crossing	B31	Crossing structures will be designed so that the existing nominal flow velocity, low flow conditions and fish passage are maintained wherever possible. This will include the following considerations: - Minimise the impact of essential instream structures by mimicking natural flows (DPI, 2005b). - Following Fairfull (2013), for waterway crossings incorporating culverts, a minimum of 300 mm of water should pool through the structure, with a centrally placed low-flow cell being preferable. In line with Cotterell (1998), it is recommended that flow over or through instream crossing structures are designed such that they maintain water velocity of 0.3 m/s or less, which is likely to	During detailed design, crossing structures will maintain existing nominal flow velocity, low flow conditions and fish passage. Requirements for crossing in aquatic habitats are detailed in Appendix F: Connectivity Strategy Management and mitigation measures addressing the UMM relevant to the Project are summarised in Section 7.15	Disturbance footprint, within riparian land	Aquatic species	Detailed Design Construction	Design Manager Environment and Sustainability Manager	Detailed design evidences design, crossing structures that maintain existing nominal flow velocity, low flow conditions and fish passage and consider connectivity	Review detailed design iterations to evidence avoidance and minimisation measures	Throughout detailed design	Environment and Sustainability Manager	Design iterations do not show design, crossing structures that maintain existing nominal flow velocity, low flow conditions and fish passage and consideration of connectivity	Update design prior to progressing to AFC Design revisions will be kept in a register outlining revision number, dates and description of revisions made.	Section 7.15 Appendix F: Connectivity Strategy

Aspect	Ref UMM #	Commitment	How Addressed	Location	Threatened Species Applicable	Timing (Project Phase)	Responsibility	Performance Indicator	Monitoring Method	Monitoring Timing and Frequency	Reporting (to who and when)	Trigger for action	Response & adaptive management (corrective action)	Document Reference
		facilitate passage for native species of fish (velocities exceeding 1 m/s, are likely to prevent upstream migration of native fish).												
Waterway crossing	B32	Any sections of stream or waterway banks that are impacted or modified by the project will be reformed or remediated to resemble the pre-work condition and form wherever possible or alternatively to a stable design form, as appropriate following the completion of construction work. This may include revegetation to stabilise bank sediments. Waterway banks impacted by the project will be reinstated such that bank stability at the crossing location is the same or better than prior to construction. Stabilising materials such as rock armouring, hydro mulch, jute matting, or other suitable geotextile materials may be utilised where necessary. Any temporary stream crossings will be removed and rehabilitated at the completion of their operational use.	Sections of streams, waterway banks and temporary stream crossings impacted or modified by the Project will be reformed, remediated, stabilised, and revegetated as detailed in Section 7.12 with monitoring per Appendix H: Flora and Fauna Monitoring Program Requirements for waterway crossings in aquatic habitats are detailed in Appendix F: Connectivity Strategy Management of vegetation clearing in waterways is detailed in Appendix B: Vegetation Clearing Procedures Management and mitigation measures addressing the UMM relevant to the Project are summarised in Section 7.15	Disturbance footprint, within riparian land	Aquatic species	Construction	Construction Manager Supervisor Environment and Sustainability Manager	ESC measures in place as per ESCP Mitigation measures identified in the SWMP are implemented Runoff and sediment transfer from the project area during construction is controlled No visible turbid water discharge offsite or into sensitive areas Vegetation clearing undertaken per with Appendix B: Vegetation Clearing Procedures. Performance indicators per Appendix H: Flora and Fauna Monitoring Program	Erosion and Sediment Control inspections Erosion and Sediment Control inspections Pre and Post Rainfall Inspection Checklists Weekly Inspections Pre-clearing Surveys and Reports Clearing Supervision Post-clearing Reports Monitoring per Reporting per Appendix H: Flora and Fauna Monitoring Program	Throughout construction Weekly Monitoring per Appendix H: Flora and Fauna Monitoring Program Throughout pre-clearing and clearing works	Environment and Sustainability Manager Transgrid Reporting per Appendix H: Flora and Fauna Monitoring Program Throughout construction	ESC measures ineffective Controls identified in the SWMP / Erosion and Sediment Control Plans not installed/ not function Evidence of notable erosion or sedimentation, particularly beyond the project boundary or into sensitive areas Notable erosion or sedimentation Over-capacity or damaged ESC devices Sediment loss Environmental Incident notification Vegetation clearing not undertaken per App B VCP Compliances managed per CEMP Triggers per Reporting per Appendix H: Flora and Fauna Monitoring Program	Review and update ESCPs as needed Review the SWMP updated as required Environmental awareness training and incorporate into toolbox talks Corrective Actions identified by the incident/non-compliance investigation process Repair, maintain, desilt or upgrade ESC device(s) Corrective actions per Reporting per Appendix H: Flora and Fauna Monitoring Program	Section 7.15 Section 7.12 Appendix F: Connectivity Strategy Appendix B: Vegetation Clearing Procedures Appendix H: Flora and Fauna Monitoring Program
Waterway crossing	B33	CLASS 1 KFH streams include larger streams supporting more sensitive aquatic habitats, with important function in the landscape and potential habitats for threatened species. As such CLASS 1 streams require additional consideration:	During detailed design, the need for and location of waterway crossings will be confirmed and alignment with the recommended crossing types	Disturbance footprint, within riparian land	Aquatic species	Detailed Design	Design Manager Environment and Sustainability Manager Project Ecologist	Detailed design evidences micrositing, avoidance and minimisation processes for waterway crossings Detailed design evidences alignment with	Review detailed design iterations to evidence micrositing, avoidance and minimisation measures, alignment with the recommended crossing types	Throughout Detailed Design Surveys as required	Environment and Sustainability Manager Transgrid Throughout detailed design	Design iterations do not show demonstrate measures required	Update design prior to progressing to AFC	Section 7.15 Section 7.6. Appendix F: Connectivity Strategy

Aspect	Ref UM M #	Commitment	How Addressed	Location	Threatened Species Applicable	Timing (Project Phase)	Responsibilit y	Performance Indicator	Monitoring Method	Monitoring Timing and Frequency	Reporting (to who and when)	Trigger for action	Response & adaptive managemen t (corrective action)	Document Reference
		- The need for and location of waterway crossings at identified CLASS 1 locations would be confirmed during detailed design by the construction contractors. - Crossing design would preference a single span bridge structure at where practicable (aligning with the recommended crossing types identified by NSW DPI Fisheries for CLASS 1 streams) to avoid instream impacts, particularly within threatened species potential distributions as identified in Table 13-29 of <i>Technical Report 1 – Revised Biodiversity Development Assessment Report</i>. - Consultation should be undertaken with NSW DPI Fisheries (and Commonwealth DCCEEW for Riek's Crayfish, as required) as to crossing designs and the potential occurrence of threatened aquatic species to inform detailed design and survey. Pre-construction survey would be completed at those CLASS 1 streams identified as supporting potential habitats for threatened species at the site of proposed new tracks or upgraded tracks (Table 13-29) to determine: - The presence/absence or likelihood of threatened aquatic species occurring - Completion of an updated 7-part test or SIA assessment, as relevant - Determine any additional mitigation measures e.g. timing of works outside the breeding season where possible - Recommendations as to micro-siting and design in order to minimise potential impacts to threatened aquatic species. The survey requirements, procedures for consultation	identified by NSW DPI Fisheries for CLASS 1 streams relevant to HumeLink East. Pre-construction surveys at CLASS 1 streams are detailed in Section 7.6. Requirements for crossing in aquatic habitats are detailed in Appendix F: Connectivity Strategy Management and mitigation measures addressing the UMM relevant to the Project are summarised in Section 7.15					the recommended crossing types identified by NSW DPI Fisheries for CLASS 1 streams Detailed design includes consideration for crossings in aquatic habitats Pre-construction surveys at CLASS 1 streams complete pre-impact	identified by NSW DPI Fisheries for CLASS 1 streams and consideration for crossings in aquatic habitats Pre-construction surveys at CLASS 1 streams			undertaken pre-impacts	number, dates and description of revisions made. Non-compliances and corrective actions managed per CEMP	

Aspect	Ref UMM #	Commitment	How Addressed	Location	Threatened Species Applicable	Timing (Project Phase)	Responsibility	Performance Indicator	Monitoring Method	Monitoring Timing and Frequency	Reporting (to who and when)	Trigger for action	Response & adaptive management (corrective action)	Document Reference
		with DPI Fisheries and Commonwealth DCCEEV and processes for reporting and consideration of recommendations into design and construction methods, as relevant, will be included in the BMP (mitigation measure B3).												
Waterway crossing	B34	In the event that any further or alternative waterway crossings are required in areas mapped as Key Fish Habitat (KFH) or indicative threatened species distribution mapping (DPI 2023a), an aquatic ecological assessment will be undertaken at the proposed crossing location. The assessment approach will be consistent with that used for the EIS and will address any potential impacts to threatened aquatic species or KFH. This assessment may be desktop based if suitable levels of information are available but may also recommend a field inspection if threatened aquatic species or sensitive aquatic habitat features are considered to have a moderate or higher likelihood of occurring, in order to guide micro-siting and design/mitigation measures to minimise impacts to aquatic environments. Further to this, if a waterway crossing at Oolong Creek is required, the waterway crossing will incorporate a fish passage barrier to prevent the upstream incursion of European Carp and Redfin Perch to protect the Endangered Southern Pygmy Perch Population. If the design cannot incorporate an appropriate fish passage barrier, further engagement will be undertaken with DPI Fisheries to confirm alternate measures for implementation.	Aquatic ecological assessment will be undertaken at any further or alternative waterway crossings required in areas mapped as KFH or indicative threatened species distribution mapping (DPI 2022a) and managed per Section 7.4 Requirements for crossing in aquatic habitats are detailed in Appendix F: Connectivity Strategy Management and mitigation measures addressing the UMM relevant to the Project are summarised in Section 7.15	Disturbance footprint, within riparian land	Aquatic species	Detailed Design Pre construction	Design Manager Environment and Sustainability Manager Project Ecologist	Aquatic ecological assessment undertaken at additional proposed crossing location Waterway crossing at Oolong Creek incorporates a fish passage barrier Further engagement undertaken with DPI Fisheries to confirm alternate measures if required	Review detailed design iterations to evidence waterway crossing connectivity measures Aquatic ecological assessment undertaken at additional proposed crossing location	Throughout Detailed Design Surveys as required	Environment and Sustainability Manager Transgrid Throughout detailed design	Design iterations do not show demonstrate connectivity measures implemented Aquatic ecological assessment undertaken at additional proposed crossing location not undertaken pre-impacts Consultation not undertaken	Update design prior to progressing to AFC Design revisions will be kept in a register outlining revision number, dates and description of revisions made. Non-compliances and corrective actions managed per CEMP	Section 7.4 Appendix F: Connectivity Strategy Section 7.15
Waterway crossing	B35	In addition to standard erosion and sediment control measures, the following procedures and considerations will be incorporated into construction methodologies for waterway	Impacts to native vegetation will be minimised during works and retention areas demarcated	Disturbance footprint, within riparian land	All species	Construction	Environment and Sustainability Manager Construction Manager Supervisor	ESC measures in place as per ESCP Mitigation measures identified in the SWMP are implemented	Erosion and Sediment Control inspections Erosion and Sediment Control inspections	Throughout construction Weekly Throughout pre-clearing and clearing works	Environment and Sustainability Manager Transgrid Throughout construction	ESC measures ineffective Controls identified in the SWMP / Erosion and Sediment Control Plans	Review and update ESCPs as needed Review the SWMP	Appendix B: Vegetation Clearing Procedures Appendix E: Supplementary

Aspect	Ref UM M #	Commitment	How Addressed	Location	Threatened Species Applicable	Timing (Project Phase)	Responsibilit y	Performance Indicator	Monitoring Method	Monitoring Timing and Frequency	Reporting (to who and when)	Trigger for action	Response & adaptive managemen t (corrective action)	Document Reference
		crossings, where appropriate and practicable: - Minimise disturbance to native vegetation, including instream, fringing and riparian vegetation within the updated indicative disturbance area. This may include the demarcation of areas of native vegetation to be retained during work. - Any coarse woody debris or boulders located within instream work sites will be temporarily stockpiled during construction and then returned to the watercourse, at locations where scour risk can be avoided and risk of dislodgment and downstream damage. - Waterway crossing work will be constructed during no or low flow conditions and under calm weather conditions. Work will also be timed to occur outside of any locally high flow periods. - Silt curtains or coffer dams will be deployed around instream work sites where required, to protect against any impacts to water quality or indirect impacts to retained vegetation. These measures will be situated so to avoid blocking fish passage wherever practical and removed as soon as they are no longer required. - Flow diversion measures will be installed on bunded waterway crossings as appropriate or where construction during no or low flow conditions is not feasible. Flow diversion measures may include pumps to ensure that water can be moved from one side of blockages to the other, with screened inlets to prevent the entrapment of aquatic fauna and outlet structures that are designed to avoid scouring of the channel.	per Appendix B: Vegetation Clearing Procedures. Salvage and re-use of aquatic habitat for waterway restoration will be implemented per Appendix E: Supplementary Hollow and Nest Strategy. Requirements for crossing in aquatic habitats are detailed in Appendix F: Connectivity Strategy Soil and water quality management measures will be implemented in accordance with the Soil and Water Management Plan to minimise erosion and sedimentation during waterway crossing works. An Erosion and Sediment Control Strategy has been provided in Appendix D of the Soil and Water Management Plan. Management and mitigation measures addressing the UMM relevant to the Project are summarised in Section 7.15				Project Ecologist	Runoff and sediment transfer from the project area during construction is controlled No visible turbid water discharge offsite or into sensitive areas Vegetation clearing undertaken per with Appendix B: Vegetation Clearing Procedures. Salvage and re-use of aquatic habitat for waterway restoration during pre-clearing and clearing works per Appendix E: Supplementary Hollow and Nest Strategy	Pre and Post Rainfall Inspection Checklists Weekly Inspections Pre-clearing Surveys and Reports Clearing Supervision Post-clearing Reports			not installed/ not function Evidence of notable erosion or sedimentation, particularly beyond the project boundary or into sensitive areas Notable erosion or sedimentation Over-capacity or damaged ESC devices Sediment loss Environmental Incident notification Vegetation clearing not undertaken per App B VCP compliances managed per CEMP	updated as required Environmental awareness training and incorporate into toolbox talks Corrective Actions identified by the incident/non-compliance investigation process Repair, maintain, desilt or upgrade ESC device(s)	Hollow and Nest Strategy Appendix F: Connectivity Strategy SWMP Section 7.15

Aspect	Ref UM M #	Commitment	How Addressed	Location	Threatened Species Applicable	Timing (Project Phase)	Responsibilit y	Performance Indicator	Monitoring Method	Monitoring Timing and Frequency	Reporting (to who and when)	Trigger for action	Response & adaptive managemen t (corrective action)	Document Reference
		Where waterways are bunded or flow obstructed, all obstructions to flow will need to be removed as soon as practical after watercourse crossing construction has been completed. • Appropriate erosion and sediment controls that take into account potentially flood prone areas will be employed to manage water quality impacts and indirect impacts to retained vegetation. • Waterway bed and bank material excavated during construction will be stockpiled outside of the active channel and avoid riparian vegetation. Any material excavated from the bed of waterways will be stockpiled separately from other materials and returned to the waterway bed following the completion of construction work. • If the stockpiling of sediment or soil is required, it will be located as far away from waterways as practicable and managed so that it is secure against flooding and runoff to prevent any sediment entering waterways. Adequate erosion and sediment control measures will be in place to protect stockpiled sediment against runoff during rainfall or flooding. • Only excavated natural materials (ENM) or virgin excavated natural materials (VENM) will be used as fill during reclamation work, i.e. no contaminated material, building or demolition rubble will be used as fill in any stream crossings. • Chemicals will be stored in adequate bunding (in accordance with Australia Standard 1940 – The storage and handling of flammable and combustible liquids)												

Aspect	Ref UM M #	Commitment	How Addressed	Location	Threatened Species Applicable	Timing (Project Phase)	Responsibilit y	Performance Indicator	Monitoring Method	Monitoring Timing and Frequency	Reporting (to who and when)	Trigger for action	Response & adaptive managemen t (corrective action)	Document Reference
		as far away from streams as practicable and appropriately protected against flooding or runoff. Spill kits will be made available, and a spill response plan developed. Plant refuelling will occur as far away from streams as possible and appropriate spill prevention measures (such as diversion bunds/cut off drains upslope and drip trays and spill kits) will be implemented when refuelling.												
Waterway crossing	B36	Regular monitoring/inspections of waterway crossing, and access track conditions will be undertaken during operation. Consideration of the maintenance and inspection recommendations detailed in Fish passage in streams: Fisheries guidelines for design of stream crossings (Cotterell 1998) to inform the monitoring/inspection details are recommended. This may include monitoring/inspections following random events, e.g. flooding. This will review: - The crossing structures, access tracks and associated erosion and sediment control measures to determine if they are continuing to operate satisfactorily. - Any maintenance requirements in order to prevent impacts to aquatic environments. - Any issues that require intervention or rehabilitation e.g. bank erosion as a result of, or in proximity to, crossing locations.	Operational monitoring is the responsibility of Transgrid. Transgrid will prepare a separate Biodiversity EMP Sub-plan and/or procedures that address the operational phase of the Project. Management and mitigation measures addressing UMMs relevant to the Project are summarised in Section 7.15 Soil and water quality management measures will be implemented during construction in accordance with the Soil and Water Management Plan to minimise erosion and sedimentation during waterway crossing works.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Section 8.3 SWMP Section 7.15

Aspect	Ref UM #	Commitment	How Addressed	Location	Threatened Species Applicable	Timing (Project Phase)	Responsibility	Performance Indicator	Monitoring Method	Monitoring Timing and Frequency	Reporting (to who and when)	Trigger for action	Response & adaptive management (corrective action)	Document Reference
Biodiversity offsetting	B37	A Biodiversity Offset Package will be prepared in consultation with NSW DCCEEW Environment and Heritage and must include, but not necessarily be limited to: - the specific biodiversity offset measures required to be implemented and delivered - specific biodiversity offset measures that have been implemented and delivered - the cost for each specific biodiversity offset measure, which would be required to be paid into the Biodiversity Conservation Fund if the relevant measure is not implemented and delivered - a Supplementary Biodiversity Assessment Strategy which outlines how impacts to biodiversity will be assessed and reported, and the process for credit reduction requests - the timing and responsibilities for the implementation and delivery of the measures required in the Package. The approved Biodiversity Offset Package may, in consultation with NSW DCCEEW Environment and Heritage, be periodically updated to reflect changes to the biodiversity offset liability.	Biodiversity offset package requirements are detailed in Section 7.1. Actual clearing extents will be provided to Transgrid, who will calculate the final biodiversity offset requirements and compare actual clearing to the predicted clearing extents outlined in the Revised BDAR. Transgrid will prepare a Biodiversity Offset Package.	All of Project	All species	Detailed Design Pre-construction Construction	Design Manager Environment and Sustainability Manager Project Ecologist	Clearing limits adhered to per Section 7.6	Detailed Design Review Spatial datasets Pre-clearing Survey Reports Pre-clearing and cleaning supervision Post clearing Survey Reports Clearing and Land Disturbance Register Clearing and Land Disturbance Permit Weekly inspections Biodiversity Offset Package (Transgrid)	As required and relevant	Clearing limits reported per per Section 7.6	Identification of additional areas of vegetation disturbance are required to construct the Project	Further assessments conducted and submitted for approval, with a recalculation of offset requirements in accordance with Section 7.1 and Section 7.4	Section 7.1
McPhersons Plain	B38	Unless otherwise agreed by the Planning Secretary, in consultation with NSW DCCEEW Environment and Heritage: - no construction work will occur within the existing horse exclusion fencing at McPhersons Plain - transmission line structures will be located outside a 30 m buffer area applied to the existing horse exclusion fencing at McPhersons Plain - construction benches will be oriented	Not applicable to HLE scope	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Aspect	Ref UM M #	Commitment	How Addressed	Location	Threatened Species Applicable	Timing (Project Phase)	Responsibilit y	Performance Indicator	Monitoring Method	Monitoring Timing and Frequency	Reporting (to who and when)	Trigger for action	Response & adaptive managemen t (corrective action)	Document Reference
		away from McPhersons Plain and will not encroach into the 30 m buffer area.												

3.4 ADDITIONAL BDAR MITIGATION MEASURES

Additional mitigation measures from the Revised BDAR which were not included as UMMs have been consolidated in Table 5.

Table 5 Additional mitigation measures from the Revised BDAR which were not included as UMMs

Ref #	Mitigation Measure (Group)	Mitigation Measure (Specific)	Applicable Species/PCT	Document Reference	How addressed
AMM1	Avoidance, rehabilitation and monitoring	Avoid and mitigate impacts on short-term or long-term post-fire refuges, (i.e., unburnt habitat within or adjacent to recently burnt landscapes that allow the species to persist and recolonise burnt areas where possible	Petauroides volans (Greater Glider)	Section 7.15	Where possible, impacts on short-term or long-term post-fire refuges will be avoided and/or minimised through detailed design, micro-siting, and construction.
AMM2	Avoidance, rehabilitation and monitoring	Mitigation measures are required to reduce these impacts on the species, including retaining (where possible) hollow bearing trees and avoiding areas of high hollow-bearing tree density during finalisation of detailed design. If hollows must be removed, nest boxes should be implemented, monitored and maintained.	Petauroides volans (Greater Glider)	Section 7.15 Appendix B: Vegetation Clearing Procedures Appendix E: Supplementary Hollow and Nest Strategy Appendix H: Flora and Fauna Monitoring Program.	Where possible, impacts to hollow-bearing trees will be avoided and/or minimised through detailed design, micro-siting, and construction. Impacts to hollow-bearing trees will be minimised during works and retention areas demarcated per Appendix B: Vegetation Clearing Procedures. Nestbox installation monitoring and implementation will be occur per Appendix E: Supplementary Hollow and Nest Strategy and Appendix H: Flora and Fauna Monitoring Program..
AMM3	Biosecurity protocols	Control the spread of invasive species will be detailed in the Biodiversity Management Plan.	Melanodryas cucullata cucullata (South-Eastern Hooded Robin)	Appendix D: Biosecurity Management Plan	A Biosecurity Plan is provided in Appendix D: Biosecurity Management Plan, which addresses the management of invasive species such as weeds, pests, diseases and their reporting obligations by the Project during construction.
AMM4	Biosecurity protocols	Development of a pest species monitoring program may be required if there is a substantial occurrence of large intact remnants and threatened species habitat within or adjacent to the disturbance areas.	Petaurus australis (Yellow-bellied Glider)	Appendix D: Biosecurity Management Plan Appendix H: Flora and Fauna Monitoring Program.	A Biosecurity Plan is provided in Appendix D: Biosecurity Management Plan, which addresses the management of invasive species such as weeds, pests, diseases and their reporting obligations by the Project during construction. Weed and pest monitoring requirements are detailed in Appendix H: Flora and Fauna Monitoring Program.
AMM5	Biosecurity protocols	Mitigation measures to control the spread of weeds and pest animals would be detailed in the Biodiversity Management Plan.	Aphelocephala leucopsis	Appendix D: Biosecurity Management Plan	A Biosecurity Plan is provided in Appendix D: Biosecurity Management Plan, which addresses the management

Ref #	Mitigation Measure (Group)	Mitigation Measure (Specific)	Applicable Species/PCT	Document Reference	How addressed
			(Southern Whiteface)6Stagonopleura guttata (Diamond Firetail) Pycnoptilus floccosus (Pilotbird) Calidris acuminata (Sharp-tailed Sandpiper)		of weeds, pests, diseases and their reporting obligations by the Project during construction.
AMM6	Biosecurity protocols	Mitigation measures to manage feral and invasive pest plants and animals will be implemented and detailed within the Biodiversity Management Plan.	Melanodryas cucullata cucullata (South-Eastern Hooded Robin) Polytelis swainsonii (Superb Parrot)	Appendix D: Biosecurity Management Plan	A Biosecurity Plan is provided in Appendix D: Biosecurity Management Plan, which addresses the management of weeds, pests, diseases and their reporting obligations by the Project during construction.
AMM8	Avoidance, rehabilitation and monitoring	Where feasible, avoid the removal of feed trees; Eucalyptus melliodora, Eucalyptus albens and Eucalyptus sideroxylon via pre-clearance surveys of updated indicative disturbance area within 20 kilometres of a known camps, and support PCTs 266, 268, 277, 278, 280, 1330 and 283. These tree species are known to provide productive foraging habitat during conception, the final weeks of gestation, birth, and lactation (August – May).	Pteropus poliocephalus (Grey-headed Flying-fox)	Section 7.15	Pre-clearance surveys to identify relevant habitat trees for avoidance.
AMM9	Changed fire regimes	During construction and operation, the amended project would implement the required bushfire management measures, including a Bush Fire Emergency Management and Evacuation Plan, to manage any increased risk of bushfire. Design specifications would be adopted to ensure conductor clearance heights adhere to recommended levels to minimise any risk of arcing or potential fire events.	PCT's 268, 280, 283, 301, 679, 939, 953, 1097, 1107, 1330	Section 6.2.3 Section 7.10 Section 7.15 Bush Fire Emergency Management and Evacuation Plan	Risk of increased bushfire will be managed by the Bushfire and Emergency Management and Evacuation Plan (HLE-AUR-ENV-ALE-PLN-0000-00001) prepared to prevent and mitigate the potential for fires, including bushfires as detailed in Section 6.2.3 and Section 7.10. Detailed design specifications will be adopted to ensure conductor clearance heights adhere to recommended levels to minimise any risk of arcing or potential fire events as detailed in Table 31.

Ref #	Mitigation Measure (Group)	Mitigation Measure (Specific)	Applicable Species/PCT	Document Reference	How addressed
					Operational aspects will be managed by Transgrid.

3.5 PERMITS AND LICENCES

Due to the potential for impacts to Matters of National Environmental Significance (MNES), a referral (EPBC 2021/9121) was prepared and lodged with the Commonwealth Department of Climate Change, Energy, the Environment and Water under the EPBC Act. The Commonwealth Minister's delegate determined on 13 April 2022 that the proposed action is a "controlled action" under the EPBC Act. Approval for the Project under the EPBC Act (Commonwealth Approval) was granted by the Australian Minister for the Environment on 18/12/2025. Conditions of this declaration and approval are listed and cross referenced throughout this plan in Table 3

A Scientific Licence under Part 2 of the BC Act (including Animal Ethics Approval under the Animal Research Act 1985) is required for fauna handling/rescue and survey work. Where rescued fauna requires rehabilitation and care, only wildlife rehabilitation organisations authorised under Part 2 of the BC Act may be used.

As this Project has been designated CSSI and assessed under Part 5 of the EP&A Act, permits relating to fish passage are not required.

3.6 GUIDELINES AND STANDARDS

The following guidelines and Australian Standards are relevant to biodiversity management on the Project:

- NSW Biodiversity Assessment Method 2020 (BAM) (Department of Planning, Industry and Environment)
- NSW Biodiversity Assessment Method 2020 Operational Manual – Stage 1 (BAM) (Department of Planning, Industry and Environment)
- Natural Resources Access Regulator (NRAR) Guideline for controlled activities on waterfront land (2018)
- Department of Primary Industries 'Policy and Guidelines for Fish Habitat Conservation and Management (DPI 2013)
- Fish Passage Requirements for Waterway Crossings (Fairfull and Witheridge 2003)
- Fishnote – Policy and Guidelines for Fish Friendly Waterway Crossings – November 2003
- Guidelines for Fish Habitat Conservation and Management – Update 2013 (DPI 2013)
- Guidelines for riparian corridors on waterfront land (DPI Water 2012)
- Guidelines for watercourse crossings on waterfront land (DPI Water, 2012)
- Guidelines for instream works on waterfront land (DPI Water, S2012)
- Guidelines for outlet structures on waterfront land (DPI Water, 2012)
- NSW Department of Primary Industries, Why Do Fish Need to Cross the Road (DPI Fisheries, 2003)
- Risk Assessment Guidelines for Groundwater Dependent Ecosystems (DPI 2012)
- Managing Urban Stormwater: Soils and Construction, Volume 1 (Landcom 2004)
- Managing Urban Stormwater: Soils and Construction Volume 2 (DECC 2008) (the "Blue Book").
- Hygiene protocol for the control of disease in frogs (DECC 2008)

The documents identified above are considered by the Project as described and referenced throughout this BMP.

4. CONSULTATION

4.1 CONSULTATION FOR PLAN PREPARATION

In accordance with CoA B30, this BMP will be prepared in consultation with Biodiversity, Conservation and Science of the Environment and Heritage Group of NSW DCCEE (BCS) and FCNSW.

Comments from the consultation process will be incorporated into this BMP where appropriate. Details of all consultations with CPHR will be submitted to DPHI along with the submission of this BMP.

4.2 ONGOING CONSULTATION

Any ongoing consultation with agencies, where required, will be undertaken in accordance with Section 3.2 of this Plan and updates will be made to this BMP where relevant. The Contractor will use a range of tools in accordance with the CSEMP to facilitate ongoing consultation and communication with the community and stakeholders (including government agencies where necessary) regarding the project. Notifications will be issued for, but not limited to, commencement of construction, significant milestones and changes to the scope of work. Refer to the CSEMP for further information.

In accordance with CoA C15 a) of the Infrastructure Approval, project documents including the EIS, approved strategies, plans or programs required under the CoA and independent reports will be publicly available on the project website.

The project website <https://www.transgrid.com.au/projects-innovation/humelink> and a 24-hour toll-free telephone number (1800 317 367) are available for any project enquiries. In accordance with CoA C15 b) the information on the website will be kept up to date.

5. EXISTING ENVIRONMENT

The following sections summarise existing biodiversity values within and adjacent to the construction footprint, including species, communities and habitats.

5.1 KEY REFERENCE DOCUMENTS

The key reference documents are detailed below:

- EIS Chapter 8– Biodiversity
- EIS Technical Report 1 – Biodiversity Development Assessment Report (Table 7-3, and Section 11)
- Amendment Report - Technical Report 1 – Revised Biodiversity Development Assessment Report (Revision 0, dated 21 June 2024);
- Amendment Report, Section 6.2
- Relevant guidelines and policy documents (Section 3.6 of this BMP).

The Project boundary and relevant ecological data are shown on the Environmental Control Map(s) included in Appendix E of the CEMP.

5.2 LANDSCAPE FEATURES

Table 6 to Table 11 summarise the relevant biodiversity landscape features identified in the EIS.

Table 6. IBRA Regions and Subregions relevant to HumeLink East.

IBRA Region	IBRA Subregion	Vegetation Formations
South-Eastern Highlands	Bondo	Dry Sclerophyll Forests (Shrubby sub-formation)
	Bungonia	Dry Sclerophyll Forests (Shrub/grass sub-formation)
	Crookwell	Wet Sclerophyll Forests (Grassy sub-formation)
	Murrumbateman	Wet Sclerophyll Forests (Shrubby sub-formation)
NSW South Western Slopes	Inland Slopes	Freshwater Wetlands
		Forested Wetlands
		Grassy Woodlands
		Semi-arid Woodlands (Shrubby sub-formation)

Table 7. Landscape features of the Bondo IBRA subregion.

Landscape Features	Description
NSW (Mitchell) Landscapes	Adelong Granite Ranges – 914.92 ha Cabramurra - Kiandra Basalt Caps and Sands – 20.45 ha Carabost Hills and Ranges – 1,165.37 ha Cootamundra - Tumut Serpentinite and Ultramafics – 3.06 ha Minjary Hills and Ranges – 39.05 ha Mt Bundarbo Basalt Caps – 168.51 ha Tooma Granite Ranges – 7,203.18 ha Young Hills and Slopes – 803.52 ha
Rivers, streams, estuaries and Strahler stream order	Within the Bondo IBRA subregion, there are 410 first, 156 second, 89 third, 81 fourth, 28 fifth and 5 sixth-order waterways.
Wetlands within and adjacent to the Project footprint	The NSW Wetlands dataset does not identify any wetlands mapped within the Bondo IBRA subregion.
Connectivity features	The landscape assessment area in the Bondo IBRA subregion is almost entirely vegetated. It is highly connected to Bago State Forest and Green Hills State Forest to the west and Red Hill State Forest to the north. There is some connectivity to surrounding reserves, including Maragle State Forest and unnamed adjoining vegetation.
Karst, caves, crevices, cliffs, rocks and other geological features of significance	NSW Seamless Geology (DRNSW, 2022) suggests the occurrence of the following soil types within the Bondo portion of the landscape assessment area: • Alluvial Soils - Medium Textured (Loams, Clay Loams)

Landscape Features	Description
	• Euchrozems • Kraznozems • Lithosols • Red Brown Earths • Red Earths - less fertile (granites and metasediments) • Red Podzolic Soils - less fertile (granites and metasediments) • Red Podzolic Soils - more fertile (volcanics and granodiorites). These occur over the following rock group suits recorded in the landscape assessment area: • Alluvium • Colluvium • Coolac Ophiolite Suite • Residual deposits • Snowy Mountains Volcanic Complex • Tom Groggin Suite • Unassigned Devonian intrusions • Unassigned Maragle Batholith units • Ungrouped Central Lachlan Silurian units • Young Suite. One area of limestone outcrop potentially supporting caves and crevices was identified. No cliffs were noted in the landscape assessment area during field surveys; however, one potential overhang (45°+) was identified by the DEM. Areas of minor rock outcrops (ranging from 5% to 10% cover) and areas of loose surface rock (with rock cover ranging from 0.1% to 10%) were recorded.
Areas of Outstanding Biodiversity Value (AOBVs)	There are no Areas of Outstanding Biodiversity Value within the Bondo portion of the Project footprint and surrounds.

Table 8. Landscape features of the Bungonia IBRA subregion.

Landscape Features	Description
NSW (Mitchell) Landscapes	Crookwell Basalts and Sands – 217.23 ha Rockley Plains – 1,163.09 ha Wollondilly - Bindook Tablelands and Gorges – 1,520.28 ha
Rivers, streams, estuaries and Strahler stream order	Within the Bungonia IBRA subregion, there are 270 first-order, 129 second-order, 64 third order and 48 fourth-order waterways.
Wetlands within and adjacent to the Project footprint	The NSW Wetlands (NSW DCCEEW, 2010) dataset identifies one unnamed dam within the Bungonia IBRA subregion.
Connectivity features	Within the landscape assessment area, patches of woodland and forest provide some connectivity to Tarlo River National Park and unnamed adjoining vegetation.
Karst, caves, crevices, cliffs, rocks and other geological features of significance	NSW Seamless Geology (DRNSW, 2022) suggests the occurrence of the following soil types within the Bungonia portion of the Project footprint: • Alluvial Soils - Medium Textured (Loams, Clay Loams) • Kraznozems • Lithosols • Soloths • Yellow Podzolic Soils - less fertile (granites and metasediments). These occur over the following rock groups recorded in the landscape assessment: • Adaminaby Group • Alluvium • Bendoc Group • Bindook Group • Colluvium • Crookwell Volcanic Complex • Lambie Group • Mount Fairy Group • Residual deposits.

Landscape Features	Description
	No cliffs were noted in the Project footprint during field surveys, however, areas of minor rock outcrops (ranging from 0.2% to 30% cover) and areas of loose surface rock (with rock cover ranging from 0.1% to 40%) were recorded.
Areas of Outstanding Biodiversity Value (AOBVs)	There are no Areas of Outstanding Biodiversity Value within the Bungonia portion of the Project footprint and surrounds.

Table 9. Landscape features of the Crookwell IBRA subregion.

Landscape Features	Description
NSW (Mitchell) Landscapes	Crookwell Basalts and Sands – 1,629.69 ha Gundary Plains – 1,082.28 ha Gunning Hills – 87.94 ha Oberon - Kialla Granites – 1,164.54 ha Rockley Plains – 3,605.00 ha Towrang Ranges – 1,046 ha
Rivers, streams, estuaries and Strahler stream order	Within the Crookwell IBRA subregion, there are 431 first, 191 second, 131 third, 39 fourth, 51 fifth and 5 sixth-order waterways.
Wetlands within and adjacent to the Project footprint	The NSW Wetlands dataset identifies one reservoir (Pejar Dam) mapped within the Crookwell IBRA subregion.
Connectivity features	The majority of the Crookwell IBRA subregion is cleared with patches of disconnected vegetation. Within the landscape assessment area, there is connectivity to Back Arm Nature Reserve to the north of the alignment and some connectivity to Tarlo River National Park at the eastern extent of the subregion. Connectivity is patchy between the alignment and Back Arm Nature Reserve.
Karst, caves, crevices, cliffs, rocks and other geological features of significance	NSW Seamless Geology (DRNSW, 2022) suggests the occurrence of the following soil types within the Crookwell portion of the landscape assessment area: • Chernozems • Chocolate Soils • Kraznozems • Lithosols • Red Earths - more fertile (volcanics and granodiorites) • Red Podzolic Soils - more fertile (volcanics and granodiorites) • Solodic Soils • Soloths • Water • Weisenboden • Yellow Earths • Yellow Podzolic Soils - less fertile (granites and metasediments) • Yellow Podzolic Soils - more fertile (volcanics and granodiorites). These occur over the following rock groups recorded in the landscape assessment area: • Aaminaby Group • Alluvium • Bendoc Group • Bishopthorpe Suite • Campbells Group • Colluvium • Crookwell Volcanic Complex • Gunning Suite • Lambie Group • Mount Fairy Group • Parkesbourne Suite • Residual deposits • Turrallio Suite. No karst, crevices, caves, or cliffs were noted in the landscape assessment area during field surveys, however, one area containing boulders and areas of minor

Landscape Features	Description
	rock outcrops (ranging from 0.2% to 10% cover) and areas of loose surface rock (with rock cover ranging from 0.1% to 40%) were recorded.
Areas of Outstanding Biodiversity Value (AOBVs)	There are no Areas of Outstanding Biodiversity Value within the Crookwell portion of the Project footprint and surrounds.

Table 10. Landscape features of the Murrumbateman IBRA subregion.

Landscape Features	Description
NSW (Mitchell) Landscapes	Boorowa Volcanics – 2,2905.89 ha Breadalbane Swamps and Lagoons – 0.03 ha Burrinjuck Ridges – 1,317.38 ha Crookwell Basalts and Sands – 6.49 ha Dalton Hills – 3,643.29 ha Doura Volcanics - 10.61 ha Gundary Plains – 2.38 ha Gunning Hills – 1,047.37 ha Marilba Range – 1,744.83 ha Upper Lachlan Channels and Floodplains – 160.94 ha Upper Murrumbidgee Gorge – 52.53 ha
Rivers, streams, estuaries and Strahler stream order	Within the Murrumbateman IBRA subregion, there are 358 first, 160 second, 69 third, 41 fourth, 47 fifth and 10 sixth order waterways.
Wetlands within and adjacent to the Project footprint	The NSW Wetlands dataset identifies one unnamed wetland mapped within the Murrumbateman IBRA subregion.
Connectivity features	The majority of the Murrumbateman IBRA subregion is cleared. The southern extent of Bango Nature Reserve is located within the landscape assessment area north of the alignment, with patches of trees providing some connectivity between the alignment and Bango Nature Reserve. There are also areas of unnamed forest within the alignment and landscape assessment area, which provides connectivity to larger areas of vegetation to the south.
Karst, caves, crevices, cliffs, rocks and other geological features of significance	NSW Seamless Geology (DRNSW, 2022) suggests the occurrence of the following soil types within the Murrumbateman portion of the landscape assessment area: • Lithosols • Red Brown Earths • Solodic Soils • Yellow Earths • Yellow Podzolic Soils - less fertile (granites and metasediments). These occur over the following rock groups recorded in the landscape assessment area: • Adaminaby Group • Alluvium • Bendoc Group • Black Range Group • Colluvium • Douro Group • Gunning Suite • Hattons Corner Group • Margules Group • Residual deposits • Unassigned Devonian intrusions. One area of limestone outcropping was identified outside the Project footprint during the desktop karst mapping assessment. However, due to access constraints, this area could not be ground-truthed during the summer 2023 surveys. Two areas containing boulder fields and areas of minor rock outcrops (ranging from 0.2% to 50% cover), and areas of loose surface rock (with rock cover ranging from 0.1% to 80%) were recorded within the Project footprint.

Landscape Features	Description
Areas of Outstanding Biodiversity Value (AOBVs)	There are no Areas of Outstanding Biodiversity Value within the Murrumbateman portion of the Project footprint and surrounds.

Table 11. Landscape features of the Inland Slopes IBRA subregion.

Landscape Features	Description
NSW (Mitchell) Landscapes	Adelong Granite Ranges – 3,799.39 ha Adrah Hills and Ranges – 3,005.64 ha Boorowa Volcanics – 2,004.94 ha Burrinjuck Ridges – 298.52 ha Carabost Hills and Ranges – 3,122.81 ha Coffin Rock Granite Hills – 610.57 ha Cootamundra - Tumut Serpentinite and Ultramafics – 451.36 ha Doura Volcanics – 2,153.02 ha Minjary Hills and Ranges – 3,178.08 ha Mt Bundarbo Basalt Caps – 110.44 ha Murrumbidgee - Tarcutta Channels and Floodplains – 2,789.66 ha Tooma Granite Ranges – 2,140.68 ha Tumut Channels and Floodplain – 339.70 ha Upper Murrumbidgee Gorge – 238.15 ha Wonga Hills and Ranges – 482.95 ha Young Hills and Slopes – 3,939.44 ha
Rivers, streams, estuaries and Strahler stream order	Within the Inland Slopes IBRA subregion, there are 1,398 first, 688 second, 277 third, 228 fourth, 97 fifth, 42 sixth, 9 seventh, three eighth and 11 ninth-order waterways.
Wetlands within and adjacent to the Project footprint	The NSW Wetlands dataset identifies two unnamed wetlands mapped within the Inland Slopes IBRA subregion.
Connectivity features	The Inland Slopes IBRA subregion is predominantly cleared farmland. Minjary National Park is located partly within the landscape assessment area and directly west of the alignment. There is connectivity to Green Hills State Forest to the south of the subregion, and connectivity to Red Hill State Forest to the north. There is connectivity to unnamed vegetation at the southern extent of the subregion, which provides connectivity to a larger patch to the north. The subregion also maintains some connectivity to Tumut State Forest and larger patches of vegetation in the neighbouring subregions.
Karst, caves, crevices, cliffs, rocks and other geological features of significance	NSW Seamless Geology (DRNSW, 2022) suggests the occurrence of the following soil types within the Inland Slopes portion of the landscape assessment area: • Alluvial Soils - Light Sandy Textured (Sands to Sandy Loams) • Alluvial Soils - Medium Textured (Loams, Clay Loams) • Brown Podzolic Soils • Euchrozems • Grey, Brown, and Red Clays • Kraznozems • Lithosols • Non-Calcic Brown Soils • Red Brown Earths • Red Earths - less fertile (granites and metasediments) • Red Podzolic Soils - less fertile (granites and metasediments) • Red Podzolic Soils - more fertile (volcanics and granodiorites) • Solodic Soils • Soloths • Yellow Earths • Yellow Podzolic Soils - less fertile (granites and metasediments). These occur over the following rock group suits recorded in the landscape assessment area: • Adaminaby Group • Alluvium

Landscape Features	Description
	• Black Range Group • Boggy Plain Suite • Bogong Suite • Colluvium • Coolac Ophiolite Suite • Douro Group • Hattons Corner Group • Residual deposits • Snowy Mountains Volcanic Complex • Tom Groggin Suite • Unassigned Central Lachlan Silurian Granites • Unassigned Devonian intrusions • Unassigned Maragle Batholith units • Unassigned Palaeozoic intrusions • Ungrouped Central Lachlan Silurian units • Ungrouped Mt Foster-Tumut Zone units • Young Suite. One area of limestone outcrop potentially supporting caves and crevices was identified. No cliffs were noted in the landscape assessment area during field surveys, however, areas of minor rock outcrops (ranging from 0.1% to 50% cover) and areas of loose surface rock (with rock cover ranging from 0.1% to 70%) were recorded.
Areas of Outstanding Biodiversity Value (AOBVs)	There are no Areas of Outstanding Biodiversity Value within the Inland Slopes portion of the Project footprint and surrounds.

5.3 CURRENT AND FUTURE CLIMATE

The Humelink East project region has semi-arid climate, characterised by warmer and wetter summers and colder winters.

Climate change impacts are projected to cause the following changes to the HLE climate (CSIRO):

- Higher average temperatures
- Higher extreme temperatures
- Decrease in annual average rainfall
- Increase intensity of heavy rainfall events
- Increase in intensity of extreme wind events
- Increase in the duration and frequency of drought events
- Harsher fire weather

A summary of climate change variables under RCP8.5 is presented in the following table.

Table 12 Climate change variables

Climate Change Variable	Baseline (1986-2005)	RCP8.5	
		2020-2039	2060-2079
Average minimum temperature (°C)	9.8	10.9	12.7
Average maximum temperature (°C)	21.8	22.9	24.7
Forest Dire Danger Index (FFDI) Days>50 per year	12.39-13.08	14.65-14.94	15.45-16.80
Average daily precipitation (mL)	1.28-1.31	1.18-1.32	1.22-1.23

** projections have been sourced from the Electricity Section Climate Information (ESCI) database using the best- and dry-case models which is presented as a range*

For further information on projected climate change variables please refer to the Project's Climate Change Risk Assessment Report (HLE-AUR-SUS-ALE-RPT-0000-00002).

The HLE Project footprint is home to a significant number of endemic species and native vegetation types. Climate change is likely to have negative impacts on these species, which have evolved to suit the region's unique physical environment. Increases in drought duration, and extreme temperatures, coupled with decreases in annual rainfall will increase water stress and reduce species survivability.

Appropriate management during design and construction can help to mitigate these impacts during operation. The following should be considered as part of construction and operational management:

- **Preference retention of established species where possible:** Established species are less vulnerable to water stress. For tree species, their larger size will contribute to a canopy shading for ecosystems below, reducing water and temperature stress on other plants in the vicinity. The HLE Vegetation Clearing Protocol (BMP_APP-B_VCP_HLE-AGJ-ENV-ALE-PRD-0000-00005) prioritises the retention of vegetation wherever feasible.
- **Maintain ecological connectivity between habitats:** To support the habitation of fauna species, addressed within the Connectivity Strategy (BMP_APP-F_Connectivity Strategy).

Further detail pertaining to the management of climate change risks is found in the Project's Climate Change Risk Assessment Report (HLE-AUR-SUS-ALE-RPT-0000-00002).

5.4 PLANT COMMUNITY TYPES

The eight recorded native vegetation formations for the Project have been assigned to 35 plant community types (PCTs). An overview of the plant community types relevant to the HumeLink East construction area is provided in Table 13.

[illegible]

5.5 THREATENED ECOLOGICAL COMMUNITIES

Five BC Act listed threatened ecological communities (TECs) occur within the HumeLink East Project footprint:

- White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland – Critically Endangered Ecological Community (CEEC)
- Coolac-Tumut Serpentine Shrubby Woodland in the NSW South-Western Slopes and South-Eastern Highlands Bioregions (EEC)
- Tableland Basalt Forest in the Sydney Basin and South-Eastern Highlands Bioregions Endangered Ecological Community (EEC)
- Monaro Tableland Cool Temperate Grassy Woodland in the South-Eastern Highlands Bioregion (CEEC)
- Montane Peatlands and Swamps of the New England Tableland, NSW North Coast, Sydney Basin, South- East Corner, South-Eastern Highlands and Australian Alps bioregions (EEC)

Two EPBC Act listed TECs occur within the HumeLink East Project footprint:

- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (CEEC)
- Alpine Sphagnum Bogs and Associated Fens (EEC)

An overview of the threatened ecological communities and the correlation between BC and EPBC Act listed communities is provided in Table 14.

Table 14. Overview of Threatened Ecological Communities.

		BC Act	EPBC Act
Threatened Ecological Communities (TECs)	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland – Critically Endangered Ecological Community (CEEC)	Yes	Yes
	Coolac-Tumut Serpentine Shrubby Woodland in the NSW South-Western Slopes and South-Eastern Highlands Bioregions (EEC)	Yes	Yes
	Tableland Basalt Forest in the Sydney Basin and South-Eastern Highlands Bioregions Endangered Ecological Community (EEC)	Yes	Yes
	Monaro Tableland Cool Temperate Grassy Woodland in the South-Eastern Highlands Bioregion (CEEC)	Yes	Yes
	Montane Peatlands and Swamps of the New England Tableland, NSW North Coast, Sydney Basin, South- East Corner, South-Eastern Highlands and Australian Alps bioregions (EEC)	Yes	Yes
	White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (CEEC)	Yes	Yes
	Alpine Sphagnum Bogs and Associated Fens (EEC)	Yes	Yes
	Other TECs	Yes	Yes
Other TECs	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland – Critically Endangered Ecological Community (CEEC)	Yes	Yes
	Coolac-Tumut Serpentine Shrubby Woodland in the NSW South-Western Slopes and South-Eastern Highlands Bioregions (EEC)	Yes	Yes
	Tableland Basalt Forest in the Sydney Basin and South-Eastern Highlands Bioregions Endangered Ecological Community (EEC)	Yes	Yes

BC Act TEC	EPBC Act TEC	PCT	IBRA Subregions				
			Bondo	Bungonia	Crookwell	Murrumbateman	Inland Slopes
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]				
			[REDACTED]				
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]				
			[REDACTED]				

5.6 FLORA

5.6.1 THREATENED FLORA

A total of 45 candidate threatened flora species were considered to have potential habitats within the Project footprint. Of the 45 potential candidate species, 9 species were excluded from further assessment based on lack of suitable habitat/habitat constraints/geographic limitations or vagrancy. A total of 36 threatened flora species were identified as requiring further assessment and were the subject of targeted surveys. Of these, two threatened flora species were directly recorded within the Project footprint:

- *Ammobium craspedioides* (Yass Daisy) listed as vulnerable under the BC and EPBC Act
- *Leucochrysum albicans* var. *tricolor* (Hoary Sunray) listed as endangered under the BC and EPBC Act

Apart from the two candidate species directly recorded, two candidate species were not recorded, and the 32 remaining candidate flora species were assumed present within all associated PCT habitats due to a lack of sufficient survey effort within suitable seasonal windows. With the exception of the flora species directly recorded within the Project footprint, the majority of flora species assumed present are considered to have a low to moderate likelihood of occurring within the Project footprint (Niche, 2024).

Table 15 details the species listed under the EPBC Act and the BC Act.

Table 15. Threatened Flora Species – confirmed or assumed present.

Scientific Name (Common Name)	BC Act	EPBC Act	IBRA Subregion	Occurrence	Likelihood of Occurrence
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
			[REDACTED]	[REDACTED]	[REDACTED]
			[REDACTED]	[REDACTED]	[REDACTED]
			[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

Scientific Name (Common Name)	BC Act	EPBC Act	IBRA Subregion	Occurrence	Likelihood of Occurrence
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED] in the Inland
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

Scientific Name (Common Name)	BC Act	EPBC Act	IBRA Subregion	Occurrence	Likelihood of Occurrence
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
			[REDACTED]	[REDACTED]	[REDACTED]
			[REDACTED]	[REDACTED]	[REDACTED]
			[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

Scientific Name (Common Name)	BC Act	EPBC Act	IBRA Subregion	Occurrence	Likelihood of Occurrence

V – Vulnerable; E – Endangered; EP – Endangered Population; CE – Critically Endangered

5.7 FAUNA

5.7.1 FAUNA HABITATS

Fauna habitat assessments were undertaken for all accessible lands within the Project footprint to assess habitat suitability for threatened fauna species (those species known or predicted to occur within the locality from existing data collection, literature, and database review). Based on the collected field data (habitat, vegetation type and condition and features of interest mapping), habitats were stratified into eight general types within the Project footprint, which included:

- Grassland habitat
- Semi-arid woodland
- Tall wet sclerophyll forest (old growth)
- Dry sclerophyll open woodland
- Aquatic and riparian habitat (wetlands, creeks, and floodplains)
- Rocky habitat (outcrops, karsts, and overhangs)
- Wet sclerophyll forest
- Artificial habitats (including existing road culverts, farm dams and bridges).

Each general habitat type and key fauna resources are described in detail in Table 7-3 of the Revised BDAR.

5.7.2 THREATENED FAUNA

A total of 38 candidate threatened fauna species (including dual credit species) were identified as having a potential to occur within the Project footprint across all Project IBRA subregions. Of the 38 potential candidate species, 12 species were excluded from further assessment based on lack of suitable habitat/habitat constraints/geographic limitations or vagrancy.

A total of 26 threatened species were identified as requiring further assessment. Targeted surveys were undertaken to inform the presence/absence of candidate threatened fauna species within the Project footprint. For most of the candidate species, surveying all areas of potential habitat/associated PCTs with sufficient effort to determine presence/absence from the whole amended project footprint was not possible.

Table 16 details the species listed under the EPBC Act and the BC Act.

Table 16 Threatened Fauna Species – known and potential.

[illegible]

Scientific Name (Common Name)	BC Act	EPBC Act	IBRA Subregion	Occurrence	Likelihood of Occurrence

Scientific Name (Common Name)	BC Act	EPBC Act	IBRA Subregion	Occurrence	Likelihood of Occurrence
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
			[REDACTED]	[REDACTED]	
			[REDACTED]	[REDACTED]	
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
			[REDACTED]	[REDACTED]	
			[REDACTED]	[REDACTED]	
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
			[REDACTED]	[REDACTED]	
			[REDACTED]	[REDACTED]	
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
			[REDACTED]	[REDACTED]	
			[REDACTED]	[REDACTED]	
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
			[REDACTED]	[REDACTED]	
			[REDACTED]	[REDACTED]	

Scientific Name (Common Name)	BC Act	EPBC Act	IBRA Subregion	Occurrence	Likelihood of Occurrence
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
			[REDACTED]	[REDACTED]	
			[REDACTED]	[REDACTED]	
			[REDACTED]	[REDACTED]	
			[REDACTED]	[REDACTED]	
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
			[REDACTED]	[REDACTED]	
			[REDACTED]	[REDACTED]	
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
			[REDACTED]	[REDACTED]	
			[REDACTED]	[REDACTED]	
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
			[REDACTED]	[REDACTED]	
			[REDACTED]	[REDACTED]	
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
			[REDACTED]	[REDACTED]	
			[REDACTED]	[REDACTED]	

Scientific Name (Common Name)	BC Act	EPBC Act	IBRA Subregion	Occurrence	Likelihood of Occurrence
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

V – Vulnerable; E – Endangered; EP – Endangered Population; CE – Critically Endangered

5.7.3 AQUATIC FAUNA AND HABITAT

A total of six threatened aquatic fauna species and TECs listed under the *Fisheries Management Act 1994* (NSW) (FM Act) and EPBC Act have been identified through the aquatic desktop assessment and field investigation as having the potential to occur within the Project footprint.

Table 17 details the species listed under the EPBC Act and the FM Act and Table 18 details the aquatic habitat within the Project area.

Table 17. Threatened aquatic species likely to occur within the Project footprint.

Scientific name	Common name	FM Act status	EPBC Act status	Occurrence	Likelihood of Occurrence
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

V – Vulnerable; E – Endangered; EP – Endangered Population; CE – Critically Endangered

Table 18. Aquatic habitat within the Project area.

IBRA subregion	Large streams and waterways within subregion

5.8 MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

Matters of National Environmental Significance (MNES) are those matters protected by the EPBC Act and include:

- World heritage properties
- National heritage places
- Wetlands of international importance (often called ‘Ramsar’ wetlands after the international treaty under which such wetlands are listed)
- Nationally threatened species and ecological communities
- Migratory species
- Commonwealth marine areas
- The Great Barrier Reef Marine Park
- Nuclear actions (including uranium mining)
- A water resource, in relation to coal seam gas development and large coal mining development.

Matters of national environmental significance, including threatened species and ecological communities, relevant to the Project are listed in Section 11 of the Revised BDAR. An assessment was undertaken within the revised BDAR to identify EPBC Act listed threatened species and ecological communities with a likely presence within the amended project footprint. The outcomes of these assessments are detailed through the above Section 5.1 to Section 5.7.

The Commonwealth Approval contains clearing limits for threatened flora species and ecological communities. The Project’s clearing limits are provided in Section 7.6 and take into consideration limits stipulated in both the Infrastructure Approval and the Commonwealth Approval, where applicable.

5.9 GROUNDWATER DEPENDENT ECOSYSTEMS

Vegetation communities dependent on groundwater were identified using the Atlas of Groundwater Dependent Ecosystems (GDEs) (Bureau of Meteorology, 2017). The project footprint supports 23 PCTs that are identified as moderate to high potential terrestrial GDEs which generally correspond with the location of large streams and waterways. The GDE potential and relative extent are detailed in Table 19.

Table 19. GDE potential and relative extent in the Project Area.

Groundwater-dependent PCTs	Associated TEC	GDE potential (BoM, 2017)	GDE extent (ha)

[illegible]

Groundwater-dependent PCTs	Associated TEC	GDE potential (BoM, 2017)	GDE extent (ha)
[REDACTED]			

*HumeLink East and West inclusive

The Project does not involve activities (i.e. deep excavations or significant grouting) likely to pose a risk to groundwater flow and quality.

5.10 WETLANDS OF NATIONAL IMPORTANCE

Ramsar wetlands are representative, rare or unique wetlands, or wetlands that are important for conserving biological diversity. A total of seven Ramsar wetlands were identified by the Protected Matters Search Tool (PMST) search for the Project footprint (Table 20). All Ramsar wetlands listed are unlikely to be impacted as they are located at least 200 kilometres from the Project footprint.

Table 20. Ramsar wetlands within the locality.

Name	Description	Distance from Project footprint
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]

Name	Description	Distance from Project footprint

5.11 MIGRATORY SPECIES

Two migratory species were recorded as a part of field surveys undertaken for the Project: Fork-tailed Swift (*Apus pacificus*) and Satin Flycatcher (*Myiagra cyanoleuca*).

A total of nine EPBC Act listed migratory species are considered relevant to the assessment (Table 21).

Table 21. Migratory Species – known and potential.

Scientific Name (Common Name)	BC Act	EPBC Act	IBRA Subregion	Occurrence	Likelihood of Occurrence

V – Vulnerable; E – Endangered; EP – Endangered Population; CE – Critically Endangered; M – Migratory; P- Protected

5.12 WEEDS AND PATHOGENS

The weeds identified across the Project area are included in the Biosecurity Management Plan (Appendix D). High Threat Weeds (HTW), Priority weeds (Riverina, Murray and Southeastern regions) under the *NSW Biosecurity Act 2015* (DPI 2023) and Weeds of National Significance (WoNS) (Australian Weeds Committee, 2018) recorded within the Project footprint are detailed in (Table 22). It is noted that there is no statutory requirement to deal with HTWs.

Table 22. Weeds of national significance, priority weeds and high-threat weeds

Scientific Name (Common Name)	Priority	WoNS	HTW	IBRA Subregion
<i>Agrostis capillaris</i> (Browntop Bent)	-	No	Yes	Crookwell, Murrumbateman
<i>Axonopus fissifolius</i> (Narrow-leaved Carpet Grass)	-	No	Yes	Bungonia, Crookwell, Murrumbateman
<i>Bidens Pilosa</i> (Cobbler's Pegs)	-	No	Yes	Bungonia,
<i>Briza subaristata</i>	-	No	Yes	Crookwell, Murrumbateman
<i>Bromus diandrus</i> (Great Brome)	-	No	Yes	Crookwell, Murrumbateman, Inland Slopes
<i>Carthamus lanatus</i> (Saffron Thistle)	-	No	Yes	Bungonia, Crookwell, Murrumbateman, Inland Slopes, Bondo
<i>Cenchrus ciliaris</i> (Buffel Grass)	-	No	Yes	Inland Slopes
<i>Cenchrus clandestinus</i> (Kikuyu)	-	No	Yes	Inland Slopes
<i>Crataegus monogyna</i> (Hawthorn)	-	No	Yes	Bungonia, Crookwell,
<i>Cyperus eragrostis</i> (Umbrella Sedge)	-	No	Yes	Bungonia, Crookwell, Murrumbateman, Inland Slopes
<i>Delairea odorata</i> (Cape Ivy)	-	No	Yes	Bondo
<i>Ehrharta calycina</i> (Perennial Veldtgrass)	-	No	Yes	Inland Slopes
<i>Ehrharta erecta</i> (Panic Veldtgrass)	-	No	Yes	Bungonia, Inland Slopes, Bondo
<i>Eragrostis curvula</i> (African Lovegrass)	-	No	Yes	Murrumbateman, Inland Slopes, Bondo
<i>Hypericum perforatum</i> (St. John's Wort)	-	No	Yes	Crookwell, Murrumbateman, Inland Slopes, Bondo
<i>Ligustrum sinense</i> (Small-leaved Privet)	-	No	Yes	Bondo
<i>Nassella neesiana</i> (Chilean Needle Grass)	Yes	Yes	Yes	Crookwell, Murrumbateman, Inland Slopes
<i>Nassella trichotoma</i> (Serrated Tussock)	Yes	Yes	Yes	Bungonia, Crookwell, Murrumbateman,
<i>Paspalum dilatatum</i> (<i>Paspalum</i>)	-	No	Yes	Bungonia, Crookwell, Murrumbateman, Inland Slopes
<i>Pinus radiata</i> (<i>Radiata Pine</i>)	-	No	Yes	Inland Slopes, Bondo
<i>Rosa rubiginosa</i> (Sweet Briar)	-	No	Yes	Bungonia, Crookwell, Murrumbateman, Inland Slopes, Bondo
<i>Rubus fruticosus</i> sp. agg. (Blackberry complex)	Yes	Yes	Yes	Bungonia, Crookwell, Murrumbateman, Inland Slopes, Bondo

Scientific Name (Common Name)	Priority	WoNS	HTW	IBRA Subregion
<i>Rumex acetosella</i> (Sheep Sorrel)	-	No	Yes	Bungonia, Crookwell, Murrumbateman, Inland Slopes, Bondo
<i>Salix rubens</i>	Yes	Yes	Yes	Murrumbateman
<i>Senecio madagascariensis</i> (Fireweed)	Yes	Yes	Yes	Bungonia, Crookwell, Inland Slopes
<i>Xanthium occidentale</i> (Noogoora Burr)	-	No	Yes	Bungonia, Inland Slopes
<i>Xanthium strumarium</i>	-	No	Yes	Inland Slopes

Refer to Appendix D for weed duties and associated control measures to manage risks associated with impacting on and managing weed spread.

6. ENVIRONMENTAL ASPECTS AND IMPACTS

The following sections summarise the potential impacts pertaining to biodiversity for the purpose of construction of the Project.

6.1 CONSTRUCTION ACTIVITIES

An environmental aspect is an element of an organisation's activities, products, or services that has or may have an impact on the environment.

Key construction activities and the associated environmental aspects that could result in adverse impacts to biodiversity include:

- Removal of vegetation as a result of clearing activities reducing available habitat and local biodiversity
- Stripping of topsoils as part of the initial earthwork's activities removing or harming any existing seed bank present and limiting natural regeneration potential
- Dust generation due to earthworks and vehicle movements affecting adjacent habitat
- Construction activities generally affecting the amenity and breeding cycles of any nearby fauna
- Introduction or spread of weeds and pathogens due to vehicle and machinery movements
- Surface grading and earthworks affecting root stock and soil structure, limiting natural regeneration potential
- Compaction of soils due to earthworks and vehicle movements increasing runoff and soil erosion risk and reducing future revegetation potential
- Construction plant and equipment and site activities resulting in ignition of vegetation.

6.2 DIRECT IMPACTS

The potential for impacts to biodiversity will depend on a number of factors. Primarily impacts will be dependent on the nature, extent and magnitude of construction activities and their interaction with the natural environment. Potential impacts attributable to construction are discussed in the sections below. The environmental management measures described in Section 7 have been developed to minimise and mitigate the impacts to biodiversity.

6.2.1 DIRECT IMPACTS TO NATIVE VEGETATION

Avoidance and minimisation of impacts on native vegetation have been considered during transmission line corridor placement, including during the strategic options assessment and detailed design. However, complete avoidance of removal of native vegetation is not practicable.

Table 13-5 of the Revised BDAR provided a summary of the direct impacts to native vegetation as a result of the project relative to other clearing impacts (including non-native vegetation, planted native vegetation and Category 1 exempt lands). The total direct impact on native vegetation for each IBRA region is outlined in Table 23.

Table 23 Total direct impact on native vegetation

Native Vegetation	IBRA subregion (ha)					Total direct impact on native vegetation*
	Bungonia	Crookwell	Murrumbidgee	Inland Slopes*	Bondo*	
Total direct impact on native vegetation for each IBRA subregion	49.15	115.06	129.11	322.55	20.56	636.43

*HumeLink East and West inclusive

The total ecosystem credit offset requirement for unavoidable impacts to native vegetation is summarised in Table 15-1 of the Revised BDAR which is repeated in Table 24.

Table 24. Summary of Ecosystem Credits for the Project

PCT	PCT name	TEC	BC Act	EPBC Act	SAII	GDE	BUN	CRO		MUR	INL*		BON*		Total*	
							Clearing (ha)	Ecosystem credits	Clearing (ha)	Ecosystem credits	Clearing (ha)	Ecosystem credits	Clearing (ha)	Ecosystem credits	Total clearing (ha)	Total credits

PCT	PCT name	TEC	BC Act	EPBC Act	SAII	GDE	BUN	CRO		MUR	INL*		BON*		Total*	
							Clearing (ha)	Ecosystem credits	Clearing (ha)	Ecosystem credits	Clearing (ha)	Ecosystem credits	Clearing (ha)	Ecosystem credits	Total clearing (ha)	Total credits

PCT	PCT name	TEC	BC Act	EPBC Act	SAII	GDE	BUN	CRO	MUR	INL*	BON*	Total*
							Clearing (ha)	Ecosystem credits	Clearing (ha)	Ecosystem credits	Clearing (ha)	Ecosystem credits
2												

PCT	PCT name	TEC	BC Act	EPBC Act	SAII	GDE	BUN	CRO	MUR	INL *	BON*	Total*
							Clearing (ha)	Ecosystem credits	Clearing (ha)	Ecosystem credits	Clearing (ha)	Ecosystem credits

PCT	PCT name	TEC	BC Act	EPBC Act	SAII	GDE	BUN	CRO	MUR	INL*	BON*	Total*				
							Clearing (ha)	Ecosystem credits	Clearing (ha)	Ecosystem credits	Clearing (ha)	Ecosystem credits	Clearing (ha)	Ecosystem credits	Total clearing (ha)	Total credits

PCT	PCT name	TEC	BC Act	EPBC Act	SAII	GDE	BUN	CRO		MUR	INL*		BON*		Total*	
							Clearing (ha)	Ecosystem credits	Clearing (ha)	Ecosystem credits	Clearing (ha)	Ecosystem credits	Clearing (ha)	Ecosystem credits	Total clearing (ha)	Total credits

PCT	PCT name	TEC	BC Act	EPBC Act	SAII	GDE	BUN	CRO	MUR	INL*	BON*	Total*
							Clearing (ha)	Ecosystem credits	Clearing (ha)	Ecosystem credits	Clearing (ha)	Ecosystem credits

PCT	PCT name	TEC	BC Act	EPBC Act	SAII	GDE	BUN	CRO	MUR	INL*	BON*	Total*
							Clearing (ha)	Ecosystem credits	Clearing (ha)	Ecosystem credits	Clearing (ha)	Ecosystem credits

[illegible]

PCT	PCT name	TEC	BC Act	EPBC Act	SAIL	GDE	BUN		CRO		MUR		INL*		BON*		Total*	
							Clearing (ha)	Ecosystem credits	Clearing (ha)	Ecosystem credits	Clearing (ha)	Ecosystem credits	Clearing (ha)	Ecosystem credits	Clearing (ha)	Ecosystem credits	Total clearing (ha)	Total credits
1																		
Total Credit Requirements							49.15	992	115.06	1513	129.11	1501	322.55	4598	20.56	394	636.43	8998

*HumeLink East and West inclusive

6.2.2 DIRECT IMPACTS TO THREATENED FLORA AND FAUNA SPECIES

As described in Section 5.6, two threatened flora species were directly recorded within the Project footprint:

- *Ammobium craspedioides* (Yass Daisy) listed as vulnerable under the BC and EPBC Act
- *Leucochrysum albicans* var. *tricolor* (Hoary Sunray) listed as vulnerable under the BC Act and endangered under the EPBC Act

Apart from the two candidate species directly recorded, 32 candidate flora species were assumed present within all associated PCT habitats due to a lack of sufficient survey effort within suitable seasonal windows.

As described in Section 5.7, a total of 26 threatened species were either directly recorded or assumed present within the Project footprint.

CoA B25 and Appendix 2 of the Infrastructure Approval establish these species extents as clearing limits (unless otherwise agreed by the Planning Secretary). The final impact extents will be subject to the finalisation of the design and construction methodology and commitments in the EIS concerning impact minimisation (and agreement by the Planning Secretary if required).

The biodiversity offset package for the Project has been developed on the assumption that any assumed species presence noted in the Revised BDAR are indeed present at those locations. Transgrid proposes to carry out additional ecological surveys, where possible, in spring and prior to any vegetation disturbance within the site to confirm the presence or absence of these threatened flora species, and to confirm potential biodiversity impacts and associated biodiversity offset requirements.

The total species credit offset requirement for species either known or likely to be impacted and species with limited potential to be impacted by the project is summarised in Table 15-8 and Table 15-9 of the Revised BDAR. This is repeated in Table 25 inclusive of species conservation significance.

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Table 25. Summary of species credits for the Project

Scientific name	Common Name	BC Act	EPBC Act	SAIL	Likelihood of impact	BUN		CRO		MUR		INL*		BON*		Total*	
						Clearing (ha)	Species credits	Clearing (ha)	Species credits	Clearing (ha)	Species credits	Clearing (ha)	Species credits	Clearing (ha)	Species credits	Total clearing (ha)	Total credits
Flora Species																	
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
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Scientific name	Common Name	BC Act	EPBC Act	SAI	Likelihood of impact	BUN		CRO		MUR		INL*		BON*		Total*	
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*HumeLink East and West inclusive

6.2.3 BUSHFIRES

A bushfire risk assessment completed as part of the EIS found the Project has a risk of ignition and spreading of a bushfire resulting from construction activities. Most Australian plant species are adapted to specific fire regimes, and different components of the fire regime may have adverse impacts on plant persistence, including fire frequency, severity, seasonality, type and spatial extent and patchiness.

High fire frequency can threaten the persistence of plant species reliant on specific fire intervals to facilitate regeneration and altered fire regimes due to the Project may result in impacts to species.

Most faunal groups within the vicinity of the Project are resilient to fire, however fires caused by the Project may have indirect impacts on fauna through habitat modification.

6.3 INDIRECT IMPACTS

Potential indirect impacts associated with the Project include:

- Inadvertent impacts to adjacent habitat or vegetation
- Reduced viability of adjacent habitat due to light, noise, dust, vibration and blasting
- Transport of weeds and pathogens from the site to adjacent vegetation
- Increased risk of starvation or exposure, and loss of shade or shelter
- Trampling of threatened flora species
- Removal and disturbance of rocks, including bush rock
- Increase in pest animal populations and predation of native fauna
- Reduced viability of adjacent habitat due to edge effects
- Changed fire regimes
- Electric and magnetic field exposure
- Fauna collision, and electrocution with transmission lines.

The extent of the indirect impacts associated with the Project are detailed in Section 13.4 of the Revised BDAR and are summarised in Table 26 below.

Table 26. Indirect impacts associated with the Project, as summarised in the Revised BDAR.

Ecological Impact	Description
Inadvertent impacts to adjacent habitat or vegetation	There is a risk of disturbance and/ or destruction of adjacent habitats and vegetation through soil disturbance, construction activities and unauthorised vehicle movements potentially resulting in accidental clearing, sedimentation and erosion and mobilisation of contaminants within the disturbance area and into adjoining native vegetation and aquatic habitats. However, the consequence of the impacts is expected to be minor following the implementation of further design refinement and mitigation measures to protect these areas.
Reduced viability of adjacent habitat due to light, noise, dust, vibration and blasting (Attachment 21, Section 1.2)	Artificial lighting impacts: Areas within the Project footprint (substations, workers accommodation facility etc), would likely require artificial lighting. Adjacent habitats are likely to be subject to disturbance during the construction phase as a result of increased noise, dust, and light spill. Light is a natural stimulus, which impacts the physiology, behaviour, and movement of all organisms. Artificial lighting alters the length of the natural photoperiod, disrupting the natural circadian rhythm and sensory ecology of organisms. This change in photoperiod can affect the foraging, breeding, and dispersal behaviours of fauna. In addition, fauna also uses lighting cues as a means for predator detection and habitat selection, both of which are impacted by the introduction of artificial light (Blackwell <i>et al.</i>, 2015). Based on available research, other impacts resulting from increased light pollution include (Altringham & Kerth, 2016; Haddock <i>et al.</i>, 2019): • Potential decrease in species abundance and diversity • Resource partitioning and shifts in foraging niches • Increased predation • Alterations to trophic interactions • Physiological influences on species • Potential behavioural adaptations. Noise and vibration impacts:

Ecological Impact	Description
	Noise and vibration construction impacts associated with the Project include the following vegetation clearing, rock blasting, rock crushing, excavation, aircraft overhead stringing/ construction works, construction road traffic noises, and the construction of transmission line infrastructure. Increased light, noise, vibration, and dust spill appear to have some level of influence on all trophic levels within urban terrestrial ecosystems, which in turn may result in both positive and negative feedback effects and impact overall ecosystem health. Although these impacts would be short-term and are unlikely to have long-term adverse effects on the viability of adjacent habitats. Any residual impacts are considered minor and are likely to be adequately managed with mitigation measures.
Transport of weeds and pathogens from the site to adjacent vegetation	There is the potential for the introduction or spread of weeds and pathogens by means of imported materials, machinery movements and increased foot traffic during construction and operation. Weeds recorded as a part of field survey activities are detailed in Section 6.4 of the Revised BDAR relative to each vegetation zone and IBRA subregion and in Table 22. No evidence of pathogens such as Root Rot (<i>Phytophthora cinnamomi</i>), Myrtle Rust (<i>Austropuccinia psidii</i>) and Chytrid Fungus (<i>Batrachochytrium dendrobatidis</i>) was recorded within the Project footprint. However, these have the potential to occur. Phytophthora has been detected in locations associated with the adjoining Snowy 2.0 Project and in Lob's Hole (BCS submission). Recent surveys of Kosciuszko National Park (KNP) have detected three species that are likely to be the most destructive of environmental values: <i>Phytophthora cinnamomi</i>, <i>Phytophthora gregata</i> and <i>Phytophthora multivora</i>. Very little of the park is currently suitable for <i>Phytophthora cinnamomi</i> but the area of suitable habitat is likely to increase in the coming decades as mean temperature increases. Only the western edge of KNP and the lower Snowy River valley are currently marginally suitable habitats for <i>Phytophthora cinnamomi</i>. The Project footprint does not overlap with Kosciuszko National Park and there are no plans for vehicle movements in the National Park. Phytophthora species are amongst the world's most destructive plant pathogens, causing catastrophic environmental degradation and can spread through the movement of vehicles, mountain bikes, horse riders, walkers, and large feral animals (McDougall & Wright, 2023). Should activities associated with the Project increase the spread of Phytophthora in the region, this could result in further associated environmental degradation. However, the risk of the Project increasing spread of Phytophthora in the region would be reduced through the implementation of Appendix D Biosecurity Management Plan.
Increased risk of starvation or exposure, and loss of shade or shelter	Displacement of resident fauna species during vegetation clearing is considered relatively low in some areas due to the modified vegetation structure resulting from long-term agricultural stock grazing. However, the risk is likely to increase in areas with larger intact remnants. Given the linear nature of the Project, proposed mitigation options and the highly mobile nature of most potential resident fauna species, the increased risk of starvation, exposure and loss of shade or shelter due to the Project is considered low.
Trampling of threatened flora species	Reduction in population extent and available habitat of threatened flora species that occur in the ground stratum could occur due to trampling, unauthorised material storage and/or vehicle and plant equipment movement during the construction and operation of the Project.
Removal and disturbance of rocks, including bush rock	Reduction in population extent and available habitat of small terrestrial fauna (small mammals, and reptiles) that occur in the ground stratum could occur due to the direct removal of habitat during the construction and operation of the Project.
Increase in pest animal populations and predation of native fauna	Section 13.9 of the Revised BDAR identifies pest animals known or likely to occur within the Project footprint. It is unlikely that work associated with the Project would result in the introduction or spread of pest species within the Project footprint. It should be considered that the Project footprint consists of large areas of agricultural land. Therefore, it is highly likely that those areas are already subjected to varying degrees of feral animal encroachment. Despite this, it is possible that native fauna may be more susceptible to predation as a result of vegetation clearing and increased levels of fragmentation within the locality.

Ecological Impact	Description
Reduced viability of adjacent habitat due to edge effects	Much of the landscape surrounding the Project footprint has been historically cleared and is subject to high levels of fragmentation. Clearing as a result of the Project is likely to have a negligible impact on existing cleared lands and access tracks due to the high levels of disturbance already associated with these areas. Vegetated fragments remaining within the landscape are generally small, isolated, and already likely to be subject to considerable edge effects such as weed invasion and altered floristic composition and structure. A total of 58.08 ha of native vegetation within the Project footprint is considered likely to be subject to edge effects as a result of the Project. Edge effects predicted to occur within these vegetation zones include increased weed incursion, light inputs, compositional and structural changes to vegetation and disturbance resulting in decreased viability of associated habitats. Likely changes to vegetation zones as a result of edge effects are difficult to quantify. Operational weed management is recommended to manage the potential risks of weed incursion within these vegetation zones. However, there are likely to be some remaining residual impacts following the implementation of weed management practices. Further consultation with the BCS is required to determine a suitable method for addressing likely residual impacts associated with edge effects where identified.
Changed fire regimes	Fire regimes within the locality are already subject to considerable alteration as a result of the agricultural and forestry land uses that dominate the landscape. There is an increased risk of bushfires where the transmission lines become damaged from storm activity or fallen vegetation. However, these risks would be low with appropriate maintenance.
Electric and magnetic field exposure	Birds Based on an analysis of predicted electric and magnetic field (EMF) levels as a result of the HumeLink Project, EMFs would remain well below reference levels for maintaining public safety under all operational scenarios (refer to <i>Technical Report 15- Electric and Magnetic Field Study</i>). Native fauna interaction with the proposed transmission lines is likely to be transient and as such, risk of exposure to EMF is considered low. However, there is an increased risk of EMF exposure for some birds (i.e., White-bellied Sea-eagle) where nesting for prolonged periods on transmission line structures in close proximity to transmission lines. Fernie & Reynolds (2005) indicate EMF impacts in birds are largely unknown, although changes in bird behaviour, physiology, endocrine system, and immune function have been noted with the potential to compromise reproduction success and fitness in some species. These risks remain largely uncertain at this time. Design measures should be considered to discourage birds from nesting at transmission line structures where these intersect significant habitats. Based on the review of available scientific literature, the risk of EMF exposure on nesting birds is considered low. Bats Echolocation is microbats' navigation system and are high-frequency sound waves made by the bat forcing air through its vocal cords. Bat vocal calls vibrate very rapidly, creating sound impulses that are either through their mouth or nostrils. The call bounces back from surrounding objects and the bat then converts this to information about the size, texture, and distance of the surrounding objects (Moss & Surlykke, 2001; Churchill, 2009). It has been suggested that EMF associated with this type of infrastructure could potentially exert an aversive behavioural response in foraging bats (impacting echolocation capabilities, which provokes avoidance behaviour) (Moss & Surlykke, 2001). However, based on the information provided in the EMF Technical Report (Aurecon, 2022), the EMF emittance from the proposed transmission lines is highly unlikely to adversely affect foraging bats or their insect prey in the vicinity.
Fauna collision, electrocution with transmission lines	Whilst several threatened fauna species are likely to occur in proximity to the proposed power lines, very few are likely to fly at elevations which would put them at risk from transmission line strike, entanglement or electrocution. Therefore, terrestrial fauna, mammals, reptiles, and amphibians are not at risk of transmission line strikes. Flying and gliding mammals have the potential to make aerial movements at elevations where transmission lines are located, although many of those species are either not present locally, they do not fly at elevations where transmission lines are positioned (many small insectivorous bats [microbats] and gliders) and they are unlikely to

Ecological Impact	Description
	accidentally strike transmission lines because they navigate by radar clicks and not sight (i.e. larger microchiropteran bats). The general fauna group most likely to have the potential for transmission line strike are the birds, but only small subsets of birds are likely to fly at elevations that would place them at risk of transmission line strike (e.g. migratory birds, and raptors). The consequences of fauna collision and electrocution with transmission lines are addressed in further detail in Table 13-20 of the Revised BDAR.

6.4 CUMULATIVE IMPACTS

Potential cumulative impacts associated with the construction of the Project were presented and assessed in Section 13.10 of the Revised BDAR. The impact of vegetation removal on listed and locally significant (common) fauna species is acknowledged, and the revegetation requirements as described in this document will be implemented for all vegetation removal.

7. ENVIRONMENTAL CONTROL MEASURES

Environmental requirements and mitigation measures are identified in the EIS, the Amendment Report, the Submissions Report, and the Revised BDAR.

Specific safeguards and management measures to address impacts to biodiversity are identified within Section 7.1 to Section 7.15.

7.1 BIODIVERSITY OFFSET PACKAGE

Transgrid prepared a Biodiversity Offset Package (BOP) (Version 4, 19 December 2024) for HumeLink in accordance with CoA B26. The BOP was prepared in consultation with NSW Biodiversity Conservation and Science Division (BCS) (now known as Conservation Programs, Heritage & Regulation (CHPR)) and the NSW Biodiversity Conservation Trust (BCT). The BOP was conditionally approved by the NSW Planning Secretary on the 20 December 2024 on the basis that:

- Further consultation be undertaken with the Department and Nature Markets and Offset division within CHPR including regarding reporting (section 1.2.1)
- At this stage, the Department does not accept the proposed use of the variation rules (section 2.4) without further consultation.

A revised version of the BOP must be submitted for the Planning Secretary's approval within 3 months of the conditional approval (20 March 2025) or as otherwise agreed with the Department. Transgrid provided Bank guarantees for the Biodiversity Offsets Package on the 20 December 2024 in accordance with the CoA B27.

The Biodiversity Offset Package may also be updated throughout construction, in consultation with CHPR and BCT, following preparation of a Biodiversity Assessment Verification Report (BAVR) in accordance with CoA B29 to the satisfaction of the Planning Secretary (refer to Section 7.3).

Transgrid will provide a report every 6 months from the approval of the BOP to the Planning Secretary, BCS and the BCT setting out the progress towards delivering each specific biodiversity offset measure.

7.2 SUPPLEMENTARY BIODIVERSITY SURVEYS AND ASSESSMENT

Transgrid must prepare a Supplementary Biodiversity Strategy (SBS) for HumeLink in accordance with CoA B28. The objectives of the SBS are to:

- Describe survey methods to confirm the extent of suitable habitat and presence of all listed SAIL species potentially impacted by the Project, in accordance with the BAM and other guidance documents that are relevant and applicable
- Describe the method for updated assessment of SAIL entities potentially or likely to be impacted by the Project
- Detail survey methods to confirm or reduce assumed presence of specific non-SAIL entities within unsurveyed areas for which a reduction in offset liability is being sought
- Define the relevant biodiversity values with regard to the SBS
- Describe methods for validation of Plant Community Types (PCTs) on previously inaccessible land.

The SBS must be prepared in consultation with CPHR and must be to the satisfaction of the Planning Secretary prior to the carrying out any Development that would impact on the relevant biodiversity values (excluding Enabling Works, if the relevant requirements of this condition are adequately addressed in the Enabling Works Management Plan of condition B64). For the purpose of the SBS and BVAR, the relevant biodiversity values are those SAIL entities listed in condition B28 of the HumeLink infrastructure approval, and any other threatened entity impacted by the Project for which a credit liability reduction is being sought, specific to the location where assumed presence is being revised in a particular BDAR.

The SBS must be peer reviewed by a suitably qualified, experienced and independent biodiversity consultant with Biodiversity Assessment Method (2020) (BAM) Accreditation whose appointment has been endorsed by the Planning Secretary. The Planning Secretary endorsed Transgrid's proposed independent biodiversity consultant on the 20 November 2024.

The results of the supplementary biodiversity surveys outlined in the SBS will be reported in a Biodiversity Assessment Verification Report (BAVR) prepared in accordance with CoA B29 (refer to Section 7.3 below).

7.3 BIODIVERSITY ASSESSMENT VERIFICATION REPORT

Transgrid must prepare a Biodiversity Assessment Verification Report (BAVR) for HumeLink in accordance with CoA C29. The objective of the BAVR is to:

- Detail of the outcomes of surveys undertaken in accordance with condition B28
- Where species are found to be present following the surveys undertaken under condition B28 or that are assumed to be present, identify measures to avoid and / or mitigate the impact to those entities for inclusion in a revised version of the Biodiversity Management Plan required under condition B30
- Provide findings and recommendations relating to the matters in (d), including, but not limited to, reducing the relevant credit obligations and calculating credit obligations for unexpected finds

The BAVR must be prepared in consultation with CHPR and must be to the satisfaction of the Planning Secretary prior to the carrying out any Development that would impact on the relevant biodiversity values (excluding Enabling Works, if the relevant requirements of this condition are adequately addressed in the Enabling Works Management Plan of condition B64). Submission of the BAVR may be staged as supplementary surveys continue along the project corridor prior to impacts upon Relevant Biodiversity Values.

The BAVR must be prepared by a suitably qualified, experienced and independent biodiversity consultant with Biodiversity Assessment Method (2020) (BAM) Accreditation whose appointment has been endorsed by the Planning Secretary.

The results of the BAVR will be incorporated into an updated version of the BOP and/or this BMP. Revision of the BMP will include updates to the known presence of threatened entities, mitigation measures and mapping / spatial data.

7.4 ADDITIONAL AND APPROPRIATE MEASURES

Transgrid is responsible for delivering Additional and Appropriate Measures (A&AMs) under Condition B30(d)(xiii) of the HumeLink State Approval to mitigate impacts on entities at risk of Serious and Irreversible Impact (SAIL). These include the Critically Endangered Ecological Community White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland (Box Gum Woodland), *Pimelea bracteata* (Rice Flower), and *Tyto tenebricosa* (Sooty Owl). These measures must be implemented within three years of project approval and are in addition to standard biodiversity offset obligations.

To meet this requirement, Transgrid developed an A&AM proposal (dated 2 September 2024) outlining targeted conservation actions. The scope of these measures will be reviewed following supplementary surveys to confirm known presence and impacts, and the preparation of the Biodiversity Assessment Verification Report (BAVR) required under Condition B29. A final A&AM proposal will be submitted to CPHR within three months of the initial BAVR's approval and may be revised if necessary.

Key commitments in the current A&AM proposal include:

- A landscape-scale Local Action Management Program (LAMP) focused on the restoration and conservation of Box Gum Woodland;
- A program in collaboration with the Botanic Gardens of Sydney to undertake seed and vegetative material collection and propagation of *Pimelea bracteata*, followed by genetic analysis to determine if planting of propagated individuals is suitable, and if so, how a translocation plan would be designed to maximise genetic diversity. Restoration of Sooty Owl habitat on Biodiversity Stewardship or Conservation Agreement sites.

The LAMP, developed in partnership with the NSW Department of Climate Change, Energy, the Environment and Water (DCCEEW), is a community-driven framework for landscape-scale ecological restoration. Its goals include increasing the extent, condition, and connectivity of Box Gum Woodland, informed by data and supported by local engagement. Through establishing ongoing funding

mechanisms and increased community awareness the program aims to deliver enduring ecological outcomes beyond regulatory compliance.

The LAMP will be funded by TransGrid for the initial 10 years, with intensive activity during the first three years (2025–2027), supported by 2.5 full-time equivalent (FTE) roles across Transgrid, NSW BCS (now CPHR), and Landcare Australia. From 2028 to the end of 2034, a further 0.5 FTE Landcare resource will support ongoing delivery. Program components include landholder engagement, baseline ecological monitoring, on-ground restoration (e.g. planting up to 55,000 provenance tubestock), and regular reporting.

A Steering Committee comprising representatives from all delivery partners (Including Transgrid and CPHR as well as other organisations as they become involved) will oversee the program, confirm the project area, and lead development of the detailed LAMP. The plan will set out restoration priorities, performance indicators, a monitoring framework, and a model for long-term funding.

Through this initiative, Transgrid aims to deliver meaningful biodiversity gains and foster strong, lasting partnerships with landholders and local communities.

7.5 CHANGED IMPACTS AND BAM ASSESSMENTS

Changed impacts may affect areas either inside or outside of the biodiversity study area.

Project changes within the biodiversity study area can be considered against the known biodiversity values that were confirmed in accordance with the BAM, as documented in the Revised BDAR. Most commonly, these types of changes include altered tower locations to minimise environmental disturbance and improve constructability, changes to construction site layouts (including ancillary or temporary infrastructure such as sediment basins and stockpile sites), and the provision of alternative access. This can result in slightly different impacts compared to the Revised BDAR. These changes would be assessed against the current mapping for vegetation zones and species (refer Section 8.9) to ensure any additional impacts are minimised and any species-specific management measures are implemented.

If a proposed change could affect a location outside of the biodiversity study area which was not included within the Revised BDAR, an assessment in accordance with the BAM will be carried out by an accredited assessor to confirm the biodiversity values present and to allow potential impacts to be identified and considered for avoidance and mitigation of impacts, and offsetting where impacts are unavoidable.

Typical situations that can require additional BAM assessment outside of the biodiversity study area may include the following:

- Areas adjacent to assessed access tracks to allow for spatial inaccuracies in the georeferenced aerial imagery used for impact assessment purposes and alterations based on actual site conditions
- Areas where alternative access arrangements might be required based on landholder preferences, ground conditions or topography not understood during the EIS phase
- Areas where alternative access is required to avoid access through and impacts within, locations with sensitive heritage and biodiversity values (for example, avoiding access through threatened insect habitat)
- Parts of road corridors in the vicinity of approved access points and internal property access roads to account for all potential ground disturbance during access point installation, including signage within the road reserve on approach to the access points, track installation, upgrades and maintenance
- Areas around water supply points to account for any disturbance to vegetation required during access upgrades or that might occur due to Project-related vehicle movements
- Areas adjacent to the assessed corridor where additional hazard tree clearance may be required.

When finalising the design and construction methodology, the Project will reduce impacts to the greatest extent practicable in accordance with the commitment in UMM B1 and the requirements of CoA B30.

The Project will assess any of these proposed changes to confirm that:

- The works can be carried out in compliance with the conditions of the Infrastructure Approval
- The works can be carried out generally in accordance with the EIS and Amendment Report (including the Revised BDAR).

Any proposed works with potential for biodiversity impacts outside the approved Project footprint or that may result in an increased biodiversity impact will require a consistency assessment. Further planning approvals (eg. Project Modification) will be obtained where increased biodiversity impacts are confirmed.

Clearing that would result in an exceedance of the limits included within Appendix 2 of the Infrastructure Approval will not occur unless otherwise agreed with the Planning Secretary.

7.6 VEGETATION CLEARING LIMITS

Clearing limits for threatened entities as they apply to the Humelink East scope and for the entire Humelink Project, per CoA B25 and in accordance with Appendix 2 of the Infrastructure Approval, are detailed as below:

- Clearing limits for threatened flora and fauna species (Table 27)
- Clearing limits for threatened ecological communities (Table 28).

An overview of clearing limits for the project are included in Figure 2 to Figure 11. These clearing limits take into consideration limits stipulated in both the Infrastructure Approval and the Commonwealth Approval, where applicable.

The Project is committed to ensuring that the clearing limits stipulated in the Infrastructure Approval and Commonwealth Approval are not exceeded and will ensure that the total predicted clearing value is tracked against the limits to identify potential exceedances.

The Environment and Sustainability Manager will be responsible for progressively tracking the extent of native vegetation clearing prior to and during clearing works. Surveying and mapping of TCZ, ECZ and HTZ clearing extents will be undertaken by a HLE surveyor and/or drone and provision of the information as a geo-referenced spatial data layer to allow progressive review of cleared areas against the approval. Drones will be used to capture images of progressive clearing (TCZ, ECZ and HTZ zones) and images included in reporting on total and partial clearing.

Progressive tracking of clearing quantities will be undertaken monthly and managed by the Clearing and Land Disturbance Permit, Pre-clearing Reports and the Clearing and Land Disturbance Register. This information will be provided to Transgrid to confirm actual impacts to biodiversity values to inform any final biodiversity offset requirements within the biodiversity offset package allowing comparison to clearing limits in Appendix 2 of the Planning Approval per CoA B25.

Actual clearing extents will be recorded and provided to Transgrid in GIS format:

- The clearing extent
- The type of clearing at each clearing location as per the clearing approach identified and assessed in the EIS and Revised BDAR.

In the unlikely event that an exceedance is predicted, the Project will discuss the matter with the Department and will seek the Planning Secretary's agreement, as required by CoA B25.

Table 27. Clearing limits for threatened species

Scientific Name	Common Name	BC Act	EPBC Act	SAIL	Humelink East Clearing Limit (ha)	Project-wide Clearing Limit (ha)	Recorded/assumed present
Flora							
<i>Acacia ausfeldii</i>	Ausfeld's Wattle	V	-	-	14.21	17.68	Assumed present
<i>Acacia bynoeana</i>	Bynoe's Wattle	E	V	-	4.17	4.17	Assumed present
<i>Acacia flocktoniae</i>	Flockton Wattle	V	V	-	11.24	11.24	Assumed present
<i>Ammobium craspedioides</i>	Yass Daisy	V	V	-	225.24	297.80	Recorded
<i>Baloskion longipes</i>	Dense Cord-rush	V	V	-	1.31	1.31	Assumed present
<i>Bossiaea fragrans</i>	Bossiaea fragrans	CE	CE	True	3.86	6.32	Assumed present
<i>Bossiaea oligosperma</i>	Few-seeded Bossiaea	V	V	-	2.42	2.42	Assumed present
<i>Caesia parviflora var. minor</i>	Small Pale Grass-lily	E	-	-	0.73	1.72	Assumed present
<i>Caladenia concolor</i>	Crimson Spider Orchid	E	V	True	18.68	34.68	Assumed present
<i>Commersonia prostrata</i>	Dwarf Kerrawang	E	E	-	0.82	0.82	Assumed present
<i>Cullen parvum</i>	Small Scurf-pea	E	-	-	11.19	19.06	Assumed present
<i>Dillwynia glaucula</i>	Michelago Parrot-pea	E	-	-	1.31	1.31	Assumed present
<i>Diuris aequalis</i>	Buttercup Doubletail	E	V	-	46.01	46.01	Assumed present
<i>Eucalyptus aggregata</i>	Black Gum	V	V	-	0.79	0.79	Assumed present
<i>Eucalyptus macarthurii</i>	Paddys River Box, Camden Woollybutt	E	E	-	2.64	2.64	Assumed present

Scientific Name	Common Name	BC Act	EPBC Act	SAIL	Humelink East Clearing Limit (ha)	Project-wide Clearing Limit (ha)	Recorded/assumed present
<i>Eucalyptus robertsonii</i> subsp. <i>hemisphaerica</i>	Robertson's Peppermint	V	V	True	0.77	0.77	Assumed present
<i>Genoplesium superbum</i>	Superb Midge Orchid	E	-	True	10.88	10.88	Assumed present
<i>Grevillea iaspicula</i>	Wee Jasper Grevillea	CE	E	True	5.19	5.19	Assumed present
<i>Grevillea wilkinsonii</i>	Tumut Grevillea	CE	CE	True	20.79	22.52	Assumed present
<i>Kunzea cabbagei</i>	Cabbage Kunzea	V	V	-	8.26	8.26	Assumed present
<i>Lepidium hyssopifolium</i>	Aromatic Peppercress	E	E	-	67.49	67.49	Assumed present
<i>Leucochrysum albicans</i> var. <i>tricolor</i>	Hoary Sunray	E	E	-	136.84	186.77	Recorded
<i>Persoonia mollis</i> subsp. <i>revoluta</i>	-	V	-	-	1.37*	1.37	Assumed present
<i>Phyllota humifusa</i>	Dwarf Phyllota	V	V	-	11.34*	11.34	Assumed present
<i>Pomaderris cotoneaster</i>	Cotoneaster Pomaderris	E	E	-	7.55*	8.96	Assumed present
<i>Pomaderris delicata</i>	Delicate Pomaderris	CE	CE	True	1.37*	1.37	Assumed present
<i>Pomaderris pallida</i>	Pale Pomaderris	V	V	True	1.17*	1.17	Assumed present
<i>Prasophyllum petilum</i>	Tarengo Leek Orchid	E	E	-	41.07*	49.68	Assumed present
<i>Pultenaea humilis</i>	Dwarf Bush-pea	V	-	-	4.01*	20.22	Assumed present
<i>Senecio garlandii</i>	Woolly Ragwort	V	-	-	0.16*	11.57	Assumed present
<i>Solanum armourense</i>	Solanum armourense	E	-	True	0.40*	0.40	Assumed present

Scientific Name	Common Name	BC Act	EPBC Act	SAIL	Humelink East Clearing Limit (ha)	Project-wide Clearing Limit (ha)	Recorded/assumed present
<i>Swainsona recta</i>	Small Purple-pea	E	E	-	55.23*	69.48	Assumed present
<i>Swainsona sericea</i>	Silky Swainson-pea	V	-	-	94.67*	116.29	Assumed present
<i>Thesium australe</i>	Austral Toadflax	V	V	-	149.05*	149.06	Assumed present
	Fauna						
<i>Aprasia parapulchella</i>	Pink-tailed Legless Lizard	V	V	-	28.92	37.28	Recorded
<i>Burhinus grallarius</i>	Bush Stone-curlew	E	-	-	46.64	60.90	Assumed present
<i>Callocephalon fimbriatum</i>	Gang-gang Cockatoo	V	E	-	198.71	475.99	Recorded
<i>Calyptorhynchus lathamii</i>	Glossy Black-Cockatoo	V	V	-	43.95	45.05	Recorded
<i>Cercartetus nanus</i>	Eastern Pygmy-possum	V	-	-	111.35	253.40	Recorded
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	V	V	True	2.37	3.08	Assumed present
<i>Crinia sloanei</i>	Sloane's Froglet	E	E	-	0	0.75	Assumed present
<i>Delma impar</i>	Striped Legless Lizard	V	V	-	91.91	92.81	Assumed present
<i>Haliaeetus leucogaster</i>	White-bellied Sea-eagle	V	-	-	1.01	3.05	Recorded
<i>Hieraaetus morphnoides</i>	Little Eagle	V	-	-	4.61	95.93	Recorded
<i>Keyacris scurra</i>	Key's Matchstick Grasshopper	E	E	-	172.40	173.91	Recorded
<i>Litoria booroolongensis</i>	Booroolong Frog	E	E	-	0.06	0.06	Assumed present

Scientific Name	Common Name	BC Act	EPBC Act	SAIL	Humelink East Clearing Limit (ha)	Project-wide Clearing Limit (ha)	Recorded/assumed present
<i>Litoria castanea</i>	Yellow-spotted Tree Frog	CE	CE	True	0.63	1.26	Assumed present
<i>Lophoictinia isura</i>	Square-tailed Kite	V	-	-	1.70	39.68	Assumed present
<i>Mixophyes balbus</i>	Stuttering Frog	E	V	True	15.55	15.55	Recorded
<i>Myotis macropus</i>	Southern Myotis	V	-	-	56.77	72.31	Recorded
<i>Ninox connivens</i>	Barking Owl	V	-	-	79.60	265.15	Recorded
<i>Ninox strenua</i>	Powerful Owl	V	-	-	60.22	252.11	Recorded
<i>Petauroides volans</i>	Greater Glider	E	E	-	22.61	158.48	Recorded
<i>Petaurus norfolcensis</i>	Squirrel Glider	V	-	-	19.53	66.95	Recorded
<i>Petroica rodinogaster</i>	Pink Robin	V	-	-	2.24	38.79	Assumed present
<i>Phascogale tapoatafa</i>	Brush-tailed Phascogale	V	-	-	21.45	179.26	Assumed present
<i>Phascolarctos cinereus</i>	Koala	E	E	-	202.99	487.51	Assumed present
<i>Polytelis swainsonii</i>	Superb Parrot	V	V	-	109.11	127.04	Recorded
<i>Synemon plana</i>	Golden Sun Moth	V	V	-	28.48*	28.48	Assumed present
<i>Tyto novaehollandiae</i>	Masked Owl	V	-	-	25.69	196.66	Recorded

Table 28. Clearing limits for threatened ecological communities.

Plant Community Type (PCT)	BC Act	EPBC Act	Humelink East Clearing Limits		Project-wide Clearing Limits			
			Full Impact (ha)	Partial Impact (ha)	Impact (ha)	Full Impact (ha)	Partial Impact (ha)	Impact (ha)
5	-	-	0.01	0.14	0.15	0.53	2.11	2.64
266	CE ²		47.45	5.87	53.32	48.31	6.56	54.87
		CE ¹	13.35	3.86				
268*	CE ²		9.53	0.49	10.02	24.13	2.49	26.62
		CE ¹	0.76	0.38				
277*	CE ²		81.68	7.46	89.14	115.39	12.60	128.00
		CE ¹	2.33	3.33				
278*	CE ²		3.92	2.34	6.27	6.40	3.28	9.68
		CE ¹	0.23	0.26				
280*	CE ²		58.59	11.02	69.61	61.10	11.23	72.33
		CE ¹	17.15	10.03				
283*	CE ²		4.47	1.62	6.10	4.47	1.62	6.10
		CE ¹	1.59	1.49				
287	-	-	1.52	0.34	1.86	4.09	3.61	7.70
290	-	-	0.44	0.00	0.44	9.57	1.99	11.56
294	-	-	0.14	0.00	0.14	0.14	0.00	0.14
295	-	-	1.72	2.47	4.19	1.79	2.47	4.26
299	-	-	1.00	2.82	3.82	5.30	13.36	18.66
301	E ⁴	-	3.38	0.00	3.38	3.38	0.00	3.38
306	-	-	0.05	0.00	0.05	3.70	0.22	3.93
314	-	-	4.95	1.24	6.20	6.83	1.43	8.26
316	-	-	8.47	10.32	18.79	8.65	10.32	18.97
322	-	-	0.82	0.09	0.91	0.82	0.09	0.91

Plant Community Type (PCT)	BC Act	EPBC Act	Humelink East Clearing Limits		Project-wide Clearing Limits			
			Full Impact (ha)	Partial Impact (ha)	Impact (ha)	Full Impact (ha)	Partial Impact (ha)	Impact (ha)
335	-	-	0.36	0.01	0.37	0.36	0.01	0.37
349	-	-	3.14	1.32	4.46	3.14	1.32	4.46
351	-	-	5.22	1.46	6.67	5.22	1.46	6.67
352*	CE ²		6.73	0.65	7.38	14.53	0.79	15.32
		CE ¹	1.24	0.39				
679	CE ⁵		0.85	0.36	1.22	2.67	2.86	5.54
727	-	-	3.55	0.49	4.04	3.55	0.49	4.04
731	-	-	4.82	3.83	8.65	5.95	4.32	10.26
870	-	-	1.10	0.83	1.93	1.10	0.84	1.93
952	E ³	-	5.16	0.71	5.87	5.16	0.71	5.87
1093	-	-	28.03	18.29	46.33	28.03	18.30	46.33
1097	E ³	-	0.30	0.08	0.38	0.30	0.08	0.38
1107	E ³	-	0.01	0.02	0.03	0.01	0.03	0.03
1150	-	-	9.02	8.68	17.69	9.02	8.68	17.69
1151	-	-	5.44	7.40	12.84	5.44	7.40	12.84
1191	CE ⁵		0.82	0.00	0.82	1.00	0.32	1.32
	-	-	0.18	0.32	0.51			
1256	-	-	0.32	0.02	0.34	0.32	0.02	0.34
1330*	CE ²		137.14	26.98	164.12	137.15	26.98	164.13
		CE ¹	33.65	24.19				

*





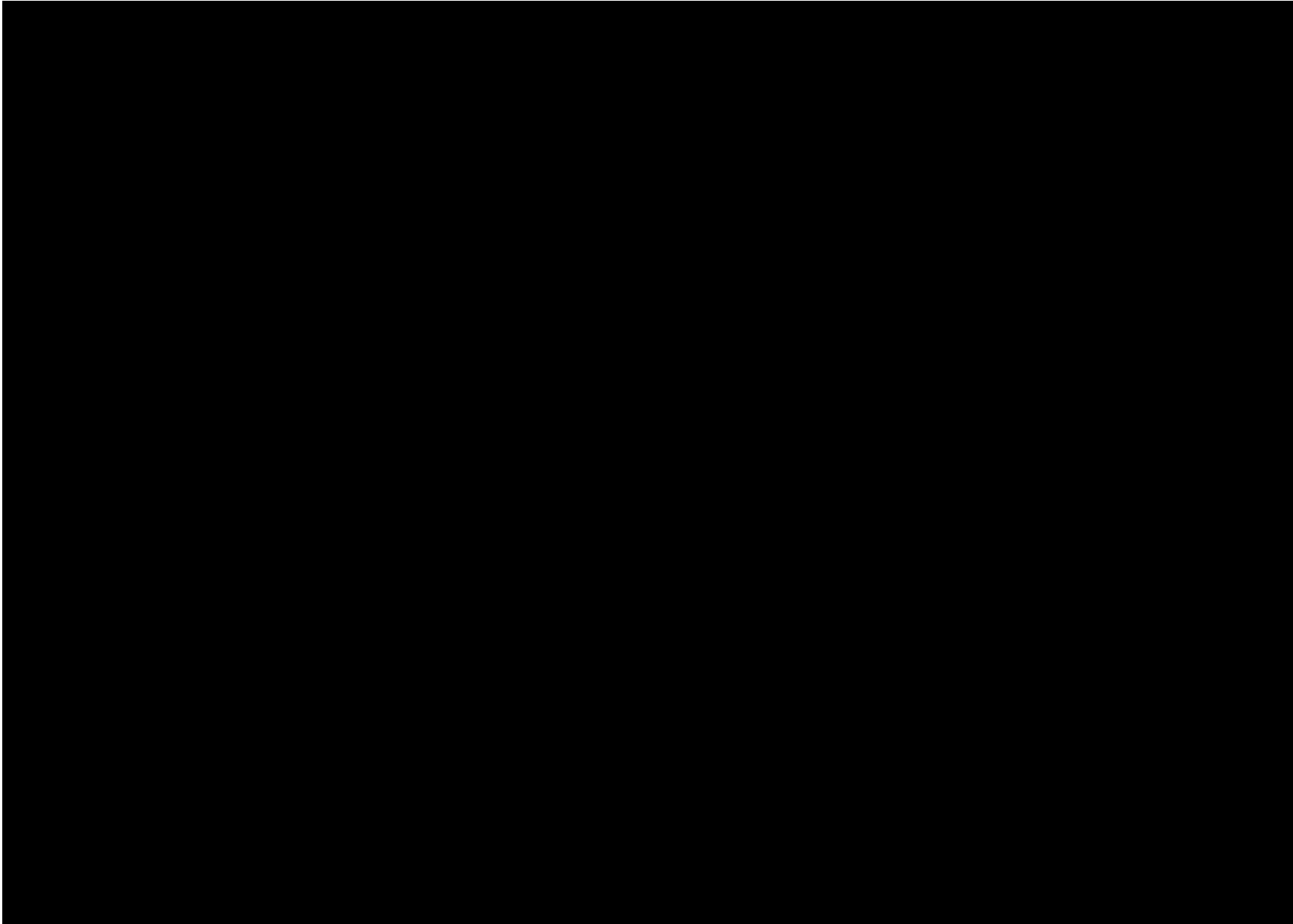


Figure 2 Project clearing limits (Map 1)



Figure 3 Project clearing limits (Map 2)



Figure 4 Project clearing limits (Map 3)



Figure 5 Project clearing limits (Map 4)

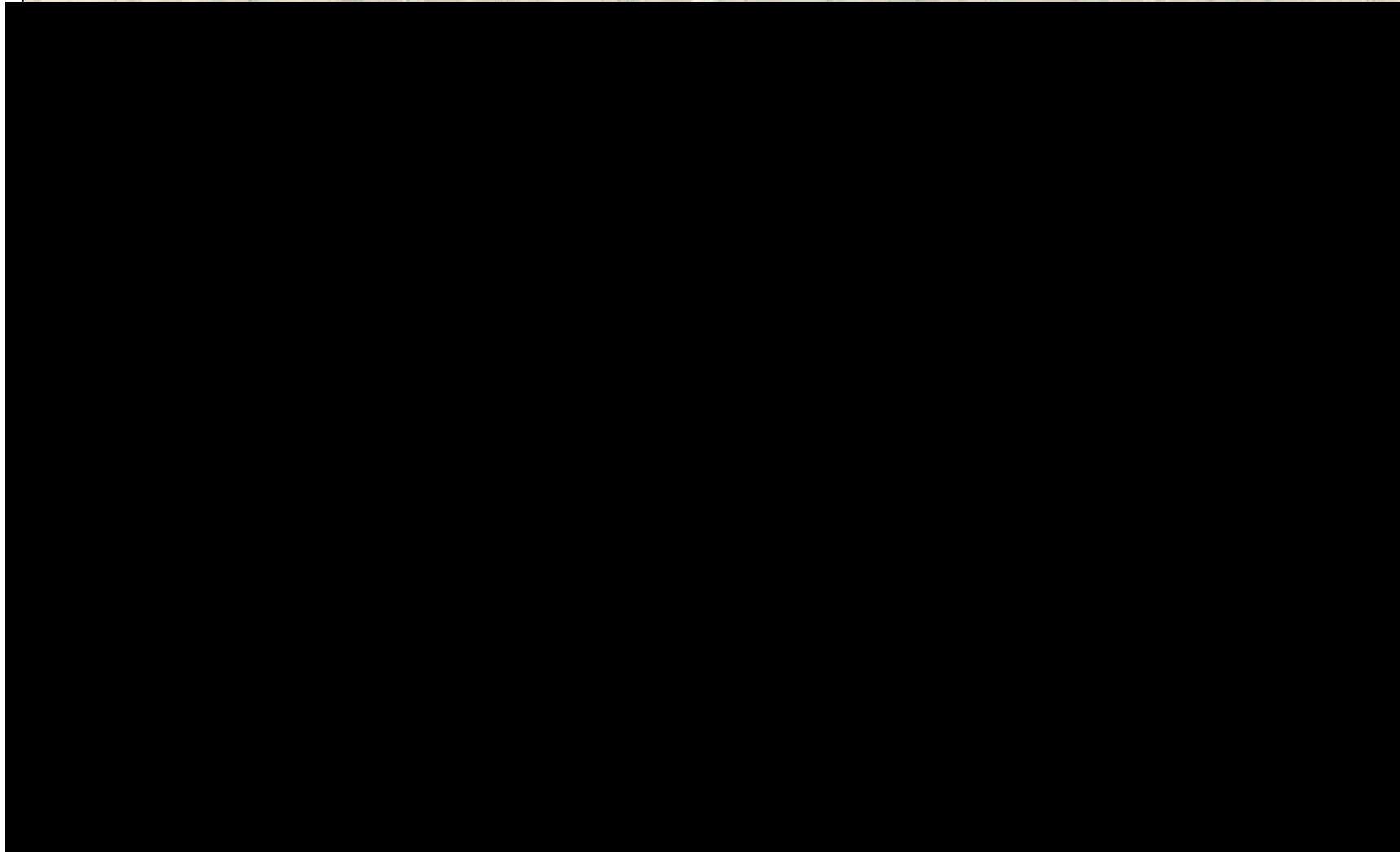


Figure 6 Project clearing limits (Map 5)

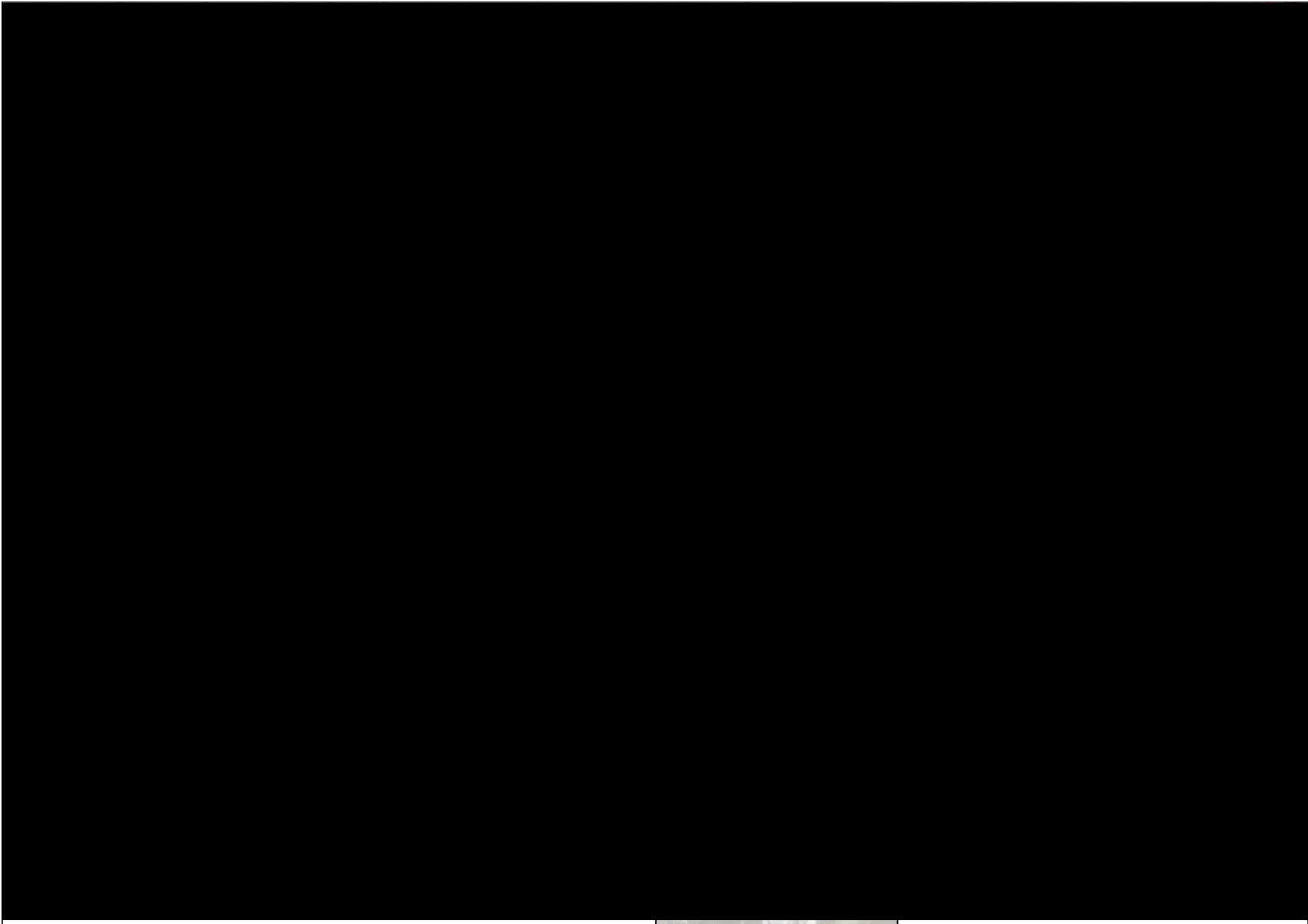


Figure 7 Project clearing limits (Map 6)

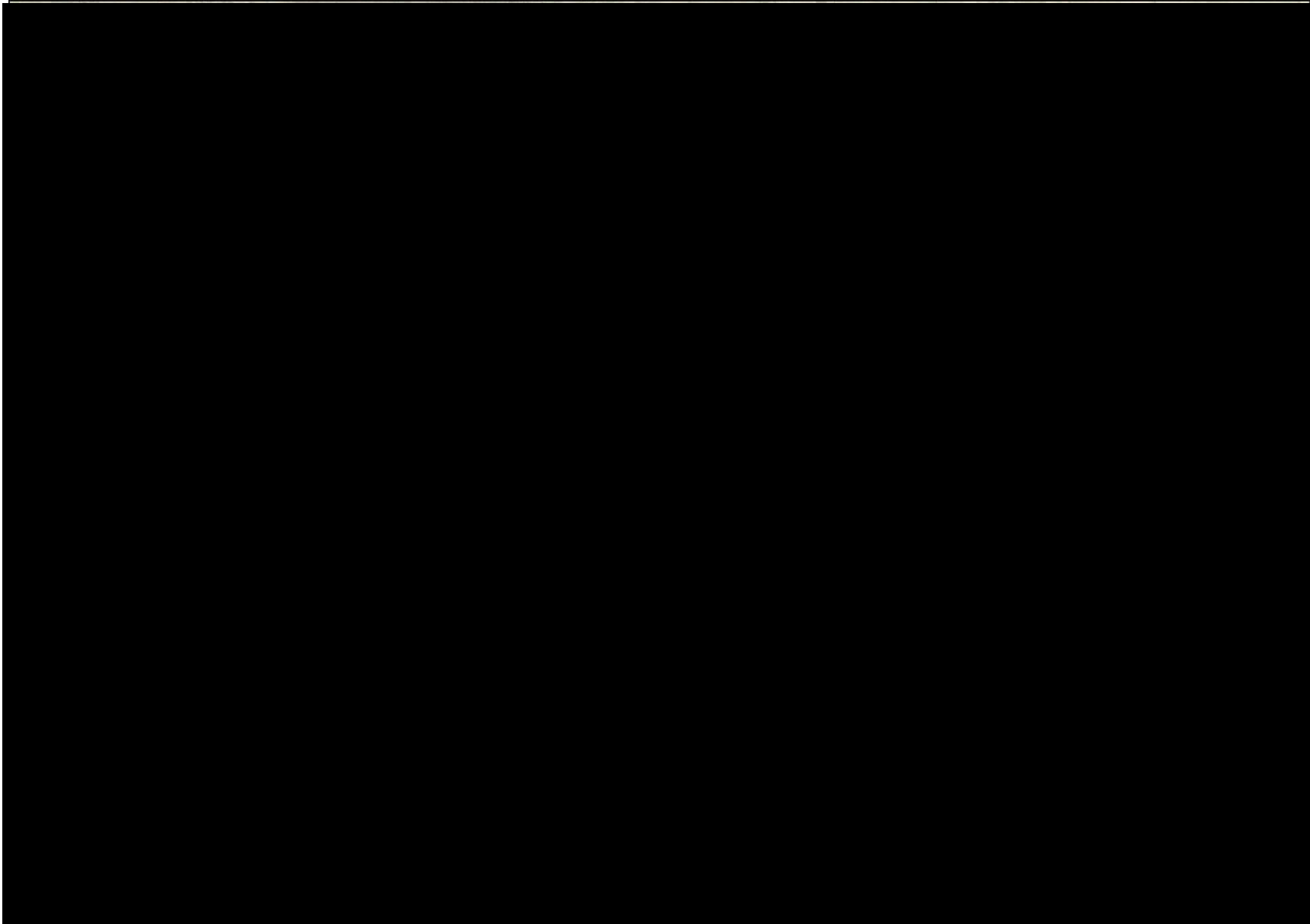


Figure 8 Project clearing limits (Map 7)



Figure 9 Project clearing limits (Map 8)

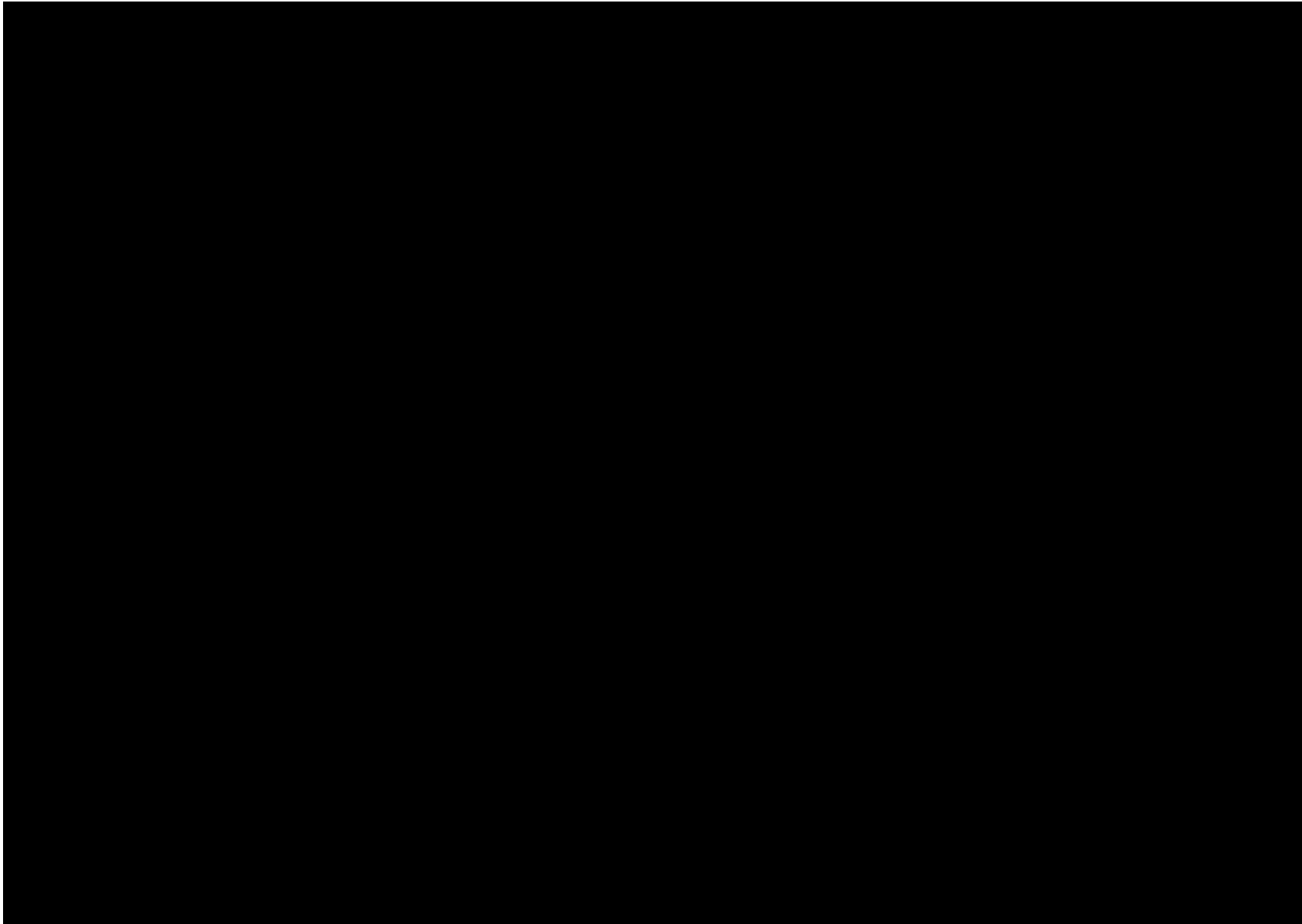


Figure 10 Project clearing limits (Map 9)

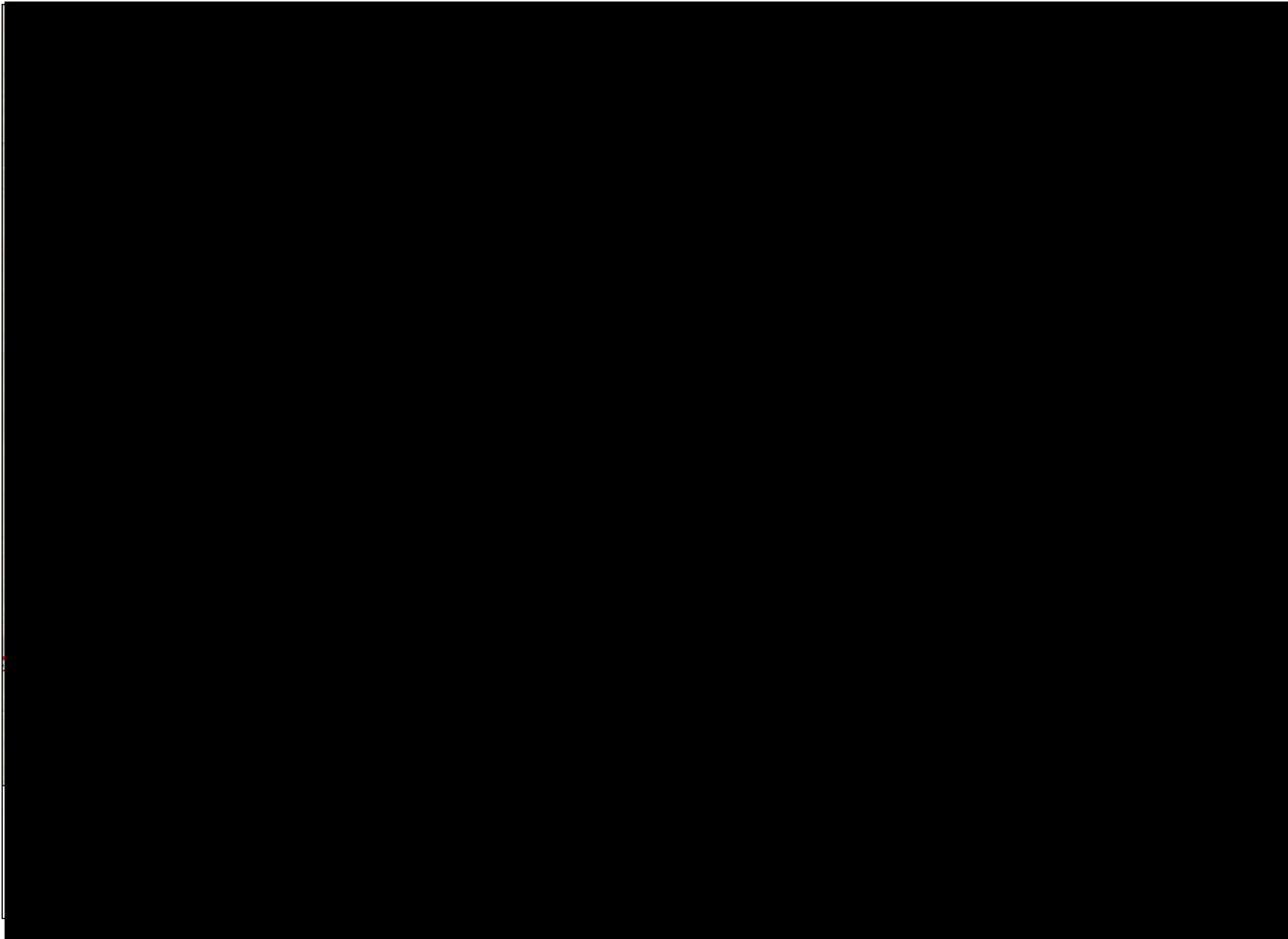


Figure 11 *Project clearing limits (Map 10)*

7.7 OPPORTUNITIES TO RETAIN AND PROTECT

Construction associated with the Project has the potential to result in impacts to biodiversity within and adjacent to the construction footprint. In order to avoid, mitigate and/or minimise these potential impacts, a range of environmental requirements and control measures are identified in the various environmental documents, including the EIS and Revised BDAR.

Opportunities to retain and protect existing vegetation within the disturbance area will be identified through detailed design and construction by:

- Prioritising areas of low biodiversity values
- Utilising existing access tracks where feasible
- Minimising the quantity of cut and fill activities
- Locating waterway crossings at narrow width locations
- Avoiding sensitive areas (SALLs, threatened species polygons, buffered threatened species locations, TECs, GDEs, hollow-bearing trees).

Consistent with UMM B1, biodiversity constraints mapping has been developed from the assessment outcomes of the Revised BDAR and is being used to avoid impacts to matters of biodiversity conservation significance to the greatest extent practicable. A summary of the constraints and the associated constraint levels is presented in Table 29. Constraints mapping will be updated in accordance with the revised outcomes of the SBS and BAVR and will be incorporated into an update of this BMP subsequent to the relevant BAVR (CoA B29) approvals. See Appendix J for current constraints mapping.

Table 29. Biodiversity constraint levels summary.

Constraint	Constraint level	Criteria
Connectivity corridors	High	Connectivity corridor locations for all threatened Gliders; OR Important riparian corridors for other threatened fauna in degraded landscapes
	Moderate	Connectivity corridor locations for threatened fauna linking two areas of high quality landscapes and habitats
	Low	Connectivity corridor locations for threatened fauna linking two areas of high quality landscapes and habitats
Booroolong frog habitat	Very high	All DPE streams mapped where they occur outside the project footprint. For habitats within the project footprint, please refer to the species polygon layer.
Conservation sites	Very high	All mapped sites
Actively managed conservation areas	No-go	All fenced areas
	Very high	All fenced areas with a 50m buffer
Hollow bearing trees	Low	All Hollow bearing trees with 100m buffer
Native vegetation and TECs	Very high	Very High or High condition of SALL; OR Very High or High condition CEEC; OR Limited extent TECs: (Alpine Sphagnum Bogs and Associated Fens, Coolac-Tumut Serpentine Shrubby Woodland, Monaro Tableland Cool Temperate Grassy Woodland)
	High	Moderate or Low condition woody CEEC listed TECs; OR Moderate or Low condition woody SALL TECs; OR Very High and High woody condition EEC (V or E)
	Moderate	Any woody TEC in moderate or low condition; OR Woody vegetation in Very high and High condition

Constraint	Constraint level	Criteria
	Low	All non-woody TECs and very low condition woody TECs
Species polygons	Very high	SAll species polygons in very high or high condition vegetation; OR CE in very high or high condition vegetation; OR SAll species in known habitat
	High	SAll moderate and low condition vegetation; OR CE in moderate and low condition vegetation; OR Endangered and Vulnerable species in high or very high condition; OR Threatened species (not SAll) in known habitat
	Moderate	Endangered species in moderate or low condition; OR Vulnerable species in moderate or low condition
Streams	Very high	Streams that are Key Fish Habitat AND Threatened aquatic species; OR Rieks Crayfish predicted habitat AND Threatened aquatic species; OR Rieks Crayfish predicted habitat AND Class 1 to 3 KFH; OR Rieks Crayfish predicted habitat AND KFH.
		Stream areas within 10m buffer of confirmed Class 1 KFH
		Stream areas within 100m buffer of likely Class 1 KFH*
	High	Streams that are Rieks Crayfish predicted habitat only
		Stream areas within 10m buffer of confirmed Class 2 KFH
		Stream areas within 100m buffer of likely Class 2 KFH*
	Moderate	Streams that are Key Fish Habitat only
		Stream areas within 10m buffer of confirmed Class 3 KFH
		Stream areas within 100m buffer of likely Class 3 KFH*
	Low	All other streams ($\geq$ Strahler order 2)
Existing tracks	No significant biodiversity constraints	Existing roads and tracks - PCT9996 extracted from vegetation layer

During detailed design and construction, Project works will prioritise areas with lower constraints as outlined in Table 29. It should also be noted that the biodiversity constraints mapping is being periodically refined as a result of ground truthing, investigations and further survey. As this process continues, the constraints mapping will be updated.

Avoidance of areas of moderate, high, very high or no-go constraints will be managed via the mitigation measures listed in Section 7.15, specifically:

- Areas of moderate, high, very high and/or no-go biodiversity constraints will be prioritised for impact avoidance during detailed design and construction.
- Works areas of moderate, high, very high and/or no-go biodiversity constraints which are not impacted will be designated as exclusion/no-go zones on ECMs and will be fenced (when works are occurring in the vicinity) to avoid incursion
- Plant, equipment, and machinery will be fitted with GPS trackers and alarms, where feasible, to alert workers when approaching areas of moderate, high, very high and/or no-go biodiversity constraints
- Training on environmental constraints (including areas of moderate, high, very high and/or no-go biodiversity constraints) will be provided to all project personnel, including relevant subcontractors through inductions, toolboxes and targeted training.

7.8 CLASS 1 AQUATIC HABITAT PRE-CONSTRUCTION SURVEYS

Per UMM B33, pre-construction surveys would be completed at CLASS 1 streams identified as supporting potential habitats for threatened species at the site of proposed new tracks or upgraded

Table 30. CLASS 1 KFH crossing sites identified for post-approval (pre-construction) aquatic survey

	2019	2020	2021
1. Total population	100.0	100.0	100.0
2. Male	50.0	50.0	50.0
3. Female	50.0	50.0	50.0
4. Population aged 0-14	15.0	15.0	15.0
5. Population aged 15-64	65.0	65.0	65.0
6. Population aged 65+	20.0	20.0	20.0
7. Urban population	55.0	55.0	55.0
8. Rural population	45.0	45.0	45.0
9. Population in the labor force	60.0	60.0	60.0
10. Unemployed population	5.0	5.0	5.0
11. Employed population	55.0	55.0	55.0
12. Population with tertiary education	10.0	10.0	10.0
13. Population with secondary education	30.0	30.0	30.0
14. Population with primary education	50.0	50.0	50.0
15. Population with no formal education	10.0	10.0	10.0

Pre-construction surveys will determine:

- The presence/absence or likelihood of threatened aquatic species occurring
- Completion of an updated 7-part test or SIA assessment, as relevant
- Determine any additional mitigation measures e.g. timing of works outside the breeding season where possible
- Recommendations as to micro-siting and design to minimise potential impacts to threatened aquatic species.

Field surveys will be developed on a site-specific basis dependent on the identified habitats for threatened species and the nature and extent of impacts to the waterway. Surveys will be undertaken in accordance with best practice guidelines, including DPI Policy and guidelines for fish Habitat Conservation and Management (2013). Consultation with DPI Fisheries will be undertaken in regard to pre-construction surveys for threatened aquatic species.

Field surveys will include sampling of biota within the habitats through the means of visual observation, physical searches and/or electrofishing and assessment of aquatic habitat features and landscape factors, including:

- Topography
- Water quality
- Water level
- Shade level
- Fish habitat types
- Aquatic habitat types
- Disturbance
- Stream width
- Bank condition
- Moss and algae cover
- Land use
- Riparian and aquatic vegetation
- Stream substrates.

All surveys will be undertaken by the Project ecologist who will have a Section 37 Licence issued under the FM Act. Surveys would not occur during periods of high turbidity (i.e. not directly after a rainfall event causing surface water runoff into the search zones).

Pre-construction Aquatic Biodiversity Survey Reports will be prepared by the Project Ecologist and include recommendations and management measures to be implemented (e.g., timing construction outside of breeding seasons, crossing type, micro siting) for the detailed design and construction methodology.

Reports will be provided to Transgrid within 3 months of completion of surveys. Reports may be provided to other agencies such as DPI Fisheries and DCCEEW upon request.

7.9 BLASTING/CRUSHING ACTIVITY

Blasting and crushing activities are not currently proposed for the Project. In the event that blasting and/or crushing activities are required, a Blast Management Plan will be undertaken, and the Project Ecologist will undertake an impact assessment of proposed activities to determine the potential impacts to Bats, Owls, Cockatoos, Raptors and Superb Parrot prior to any blasting and/or crushing activities taking place. If any impacts are likely, the impact assessment will include appropriate mitigation measures to be proposed and implemented. Mitigation measures may include cessation of certain activities, avoiding breeding seasons (where practicable) and/or amending the construction methodology including selecting alternative plant or equipment.

Any impact assessments completed for blasting and/or crushing activities will be provided to NSW DCCEEW Environment and Heritage. In the unlikely event that impacts are unavoidable, offsetting requirements will be discussed with NSW DCCEEW Environment and Heritage.

7.10 BUSHFIRE MANAGEMENT

Bushfire risk will be managed through the implementation of Safe Works Method Statements, which will include safe work methods to minimise risk of starting bushfire, where relevant. This could include consideration of working during High or Extreme Fire Danger periods; working in areas of elevated bushfire risk such as vegetated areas and Hot Works methods.

Detailed design specifications will be adopted to ensure conductor clearance heights adhere to recommended levels to minimise any risk of arcing or potential fire events.

Additionally, a comprehensive Bush Fire Emergency Management and Evacuation Plan will be prepared consistent with the NSW Rural Fire Service document: A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan.

Where Asset Protection Zones (APZ) are required for accommodation camps, or other habitable structures, the Bushfire Practitioner, Project Arborist and Project Ecologist will collectively define strategy for establishing a proposed APZ to minimise impacts to biodiversity.

Where vegetation removal cannot be avoided through project design, siting and/or construction standards (i.e. BAL), general guidance for APZ establishment may include:

- Avoid and minimise impacts to threatened species and TECs
- Ensure that a mixture of mature and young trees is retained to allow for retention of fauna habitat as well as ongoing replacement
- Retain all hollow-bearing trees (protected and threatened fauna habitat)
- Retain female *Allocasuarina* spp. in favour of male specimens (Glossy Black-Cockatoo habitat)
- Retain isolated patches (islands) of groundcover to provide ground habitat
- Retain all large, high landscape significance trees, and
- Retain tree species that are not well represented within the site and surrounds.

Additional and/or alternative priorities for APZ establishment may be identified by the relevant Subject Matter Experts during review of the site.

7.11 ENVIRONMENTAL CONTROL MAPS

To assist with construction planning and management, identified site constraints will be consolidated on a series of map-based sheets for each work area called Environmental Control Maps (ECMs). ECM's will be based on the latest survey information and will delineate site boundaries, no-go zones and identify environmental controls, procedures and relevant environmental requirements to that location or specific activity. Each ECM will:

- Illustrate the environmental constraints of the site, including:
 - Ecologically sensitive items, including threatened species and threatened ecological communities, including no-go zones.
 - Biodiversity constraints mapping as per spatial data All hollows/habitat features/nests
 - Aboriginal and non-Aboriginal heritage sites, including items, places, objects and conservation areas
 - Local waterways
 - Contamination, including potential or actual acid sulphate soil areas, contaminated sites or areas of naturally occurring asbestos
 - Noise sensitive receivers (e.g. residential dwellings, educational institutions)
 - Illustrate no-go zones
- Indicate which environmental procedures (including EWMSs), environmental approvals or licences are applicable
- Illustrate the site layout, showing significant structures, work areas and boundaries
- Illustrate or indicate the environmental control measures (including items such as concrete washouts and refuelling areas) and environmentally sensitive receivers
- Be endorsed by the Environment and Sustainability Manager or delegate
- Be communicated to relevant workers, including sign-off for the appropriate procedures prior to commencing works on the specific site and/or activity.

ECMs will be used in conjunction with EWMS and Erosion and Sediment Control Plans (ESCPs) to help identify key risk areas and provide a forum for ongoing communication with construction personnel throughout the delivery of the Project.

ECMs for camps and compounds have been prepared and are included in Appendix E of the CEMP. ECMs for all remaining project areas will be developed progressively, and implemented prior to any impacts in the subject areas. Mitigation measures associated with ECM's have been cross-referenced in Table 4. ECMs will be iterative and updated frequently based on changes to site layouts. As part of the environmental induction, all staff and subcontractors working on-site will be provided with an understanding of the risks associated with working in or near environmentally sensitive areas, based on the ECMs.

ECMs will be progressively updated throughout construction areas as works progress to communicate mitigation and management measures to in field staff and operators. ECMs will be stored and displayed onsite with copies provided to Supervisors.

A spatial reference data has been created by TG and will be maintained by TG for the duration of the Project. A sub-set of applicable data, applicable to HLE has been extracted and is found in Appendix I. This spatial data set will inform all ECMs for the project. ECMs will be dated and labelled as per the date and labelling of the underlying spatial data and updated as and when new spatial data is received.

Constraints Mapping has also been included in Appendix J, which also forms part of the spatial data set and will also inform the ECMs, these constraints maps will be updated with the approval of the BVAR and reflected in updated ECMs..

7.12 REHABILITATION OF TEMPORARY DISTURBANCE

A definition of rehabilitation is provided in the Planning Approval for the Project as "The restoration of land disturbed by the development to a good condition, to ensure it is safe, stable and non-polluting". The rehabilitation requirements for the Project are detailed in MCoA (NSW) B62 and B63.

MCoA (NSW) B62 states that within 12 months of operation commencing, the rehabilitation objectives for the accommodation camps area(s) are:

- Safe, stable and non-polluting.
- All infrastructure including above and below ground to be decommissioned and removed to a depth of 500 mm, unless the Planning Secretary agrees otherwise
- Restoring land capability to pre-existing productive capacity
- Ensure public safety at all times

MCoA (NSW) B63 states that the rehabilitation of the areas where ancillary facilities and earthwork material sites are located, is undertaken within 6 months of the completion of construction, upgrading or decommissioning. The rehabilitation objectives are:

- Safe, stable and non-polluting
- Progressively rehabilitate the site as soon possible following disturbance
- To be decommissioned and removed, unless the Planning Secretary agrees otherwise
- Restoring or maintain land capability to pre-existing use
- Ensure public safety.

In addition to the above, MCoA (NSW) B26 (d)(v) requires rehabilitation of temporary disturbance areas (is undertaken) to facilitate natural regeneration with suitable native species.

Ancillary facilities and other areas subject to temporary disturbance as a result of construction will be rehabilitated once the temporary use is no longer required, and following the decommissioning and removal of temporary infrastructure.

The restoration of disturbed areas will be prioritised within lands of high biodiversity significance including connectivity corridors, intact vegetation remnants and breeding habitat for fauna, including threatened species and ecological communities. Riparian areas subject to disturbance will be progressively stabilised and rehabilitated. Specific rehabilitation requirements for threatened insect habitats are outlined in Appendix G: Threatened Insect Habitat Rehabilitation Plan.

Disturbed areas (including areas not required for operation) will be stabilised/rehabilitated to a standard either as agreed with the landowner or in accordance with the relevant Managing Urban Stormwater (Blue Book) or comparable best practice guidelines.

7.12.1 NATURAL REGENERATION

In accordance with NSW Conservation Management Notes – Natural Regeneration (OEH, 2011) “Natural regeneration means allowing or assisting the bush to grow back by itself. It is the most effective and most economical way to expand patches of native vegetation and improve their condition”.

Harnessing natural processes or natural regeneration should be considered as a first option for re-establishing native vegetation. Natural regeneration involves the germination of seedlings from seedfall from existing nearby vegetation and is an effective method of establishing a large number of plants, particularly where establishment is required at a large scale. Natural regeneration is also a form of rehabilitation.

Natural regeneration provides the following advantages:

- Genetics are appropriate and relevant to the location of the site (i.e. local provenance)
- It ensures that indigenous species are established rather than non-indigenous species
- It ensures that regeneration is reflective of the vegetation present within the adjacent plant community types
- Heavy machinery or vehicles won't necessarily be required to traverse the existing site following the placement of topsoil
- It establishes vegetation with random spacing, reflective of natural processes that would occur with the surrounding plant community types
- It provides a greater chance of long-term success.

Seed production areas or seed banks will supply seed, which is dispersed by a combination of wind, water and animals is the preferred rehabilitation method. The seed source for natural regeneration can be from parent trees, residual native plant seed within the soil, wind-blown seed and fauna that transfer and deposit seeds in an area. Water and nutrients are captured in fertile patches of natural vegetation, where plants can germinate and grow. To create a fertile patch, branches can be laid across a slope or the soil can be physically manipulated using mechanical intervention to create divots or depressions where water and nutrients can be retained.

Where remnant vegetation remains, it will be the starting point to encourage natural regeneration. Remnant vegetation will remain in various locations adjoining areas of temporary clearing including, for example, vegetation adjoining the access tracks and vegetation adjacent to the laydown areas (temporary disturbance areas). In undertaking rehabilitation, the following will occur where practicable:

- Material resources from the area will be salvaged and stockpiled for beneficial reuse. This could include soil and vegetative resources such as hollows and mulch
- Topsoil will be removed and stockpiled for future reuse
- Stabilisation of any areas available within the earthwork's material site will occur in accordance with the progressive erosion and sediment control plans. Stabilisation would occur progressively, as any of the sections of the earthwork's material site are no longer required and/or in consultation with the landowners, where relevant
- On completion of the work in the temporary construction areas, topsoil shall be re-spread over the disturbed surface in order to promote natural revegetation from the seed and nutrients contained within the topsoil
- Mulch and woody debris will be a by-product of vegetation clearing activities. Where practicable, this material will be reused in the progressive rehabilitation works following placement of topsoil.
- To create a fertile patch, branches can be laid across a slope or the soil can be physically manipulated using mechanical intervention to create divets or depressions where water and nutrients can be retained;
- Vehicle movement will be restricted to the greatest extent possible;
- Areas of natural regeneration may be demarcated on site, to prevent inadvertent access or disturbance (dependant on the existence and nature of any surrounding works); and
- Any other recommendations from the Project ecologist and/or a restoration ecologist, such as scarification of area.

7.12.2 ACTIVE REVEGETATION

Where remnant or adjacent vegetation is not available, active revegetation may be implemented by the Project (meaning, planting or direct seeding for the purpose of regeneration (OEH, 2011), in consultation with the Project ecologist and/or a restoration ecologist.

Direct seeding is the preferred approach, and this may include a seed collection program, taking into account species type, location, seasonal seeding times, any specialist requirements, propagation methodologies, etc. Where identified, collection of seed would occur typically during pre-clearing activities, but may also occur during clearing and post-clearing, depending on recommendations by Project Ecologist and/or restoration ecologist. Such seed collection will be undertaken in general accordance with Conservation Management Notes – Seed Collecting (OEH, 2011). Where seed is collected, records will be retained and will include the species type, quantities, and location of collection. Note, if seed is purchased, it will be certified as clean in accordance with a natural certification scheme.

Active revegetation is not intended to occur across all locations of project disturbance, nor as an ongoing rehabilitation activity. Where seed has been collected and propagated, this will be spread/planted in the vicinity of the seed production areas/seed-bank source following placement of topsoil, or in accordance with Project ecologist and/or a restoration ecologist recommendation.

A summary of the direct seeding considerations is provided in Table 31.

Table 31. Direct seeding considerations

Method	Description
Direct seeding	• Direct seeding involves sowing plant seed either by hand or using machinery • Direct seeding is an alternative revegetation to the installation of nursery-grown tube stock, which can be more cost-effective when high-density revegetation of large areas is required • Seeds and supplementary planting should have sufficient genetic variability to facilitate adaptation in a changing climate. • Timeframes for direct seeding and supplementary planting should be discussed with seed/plant providers to ensure successful establishment. • If necessary, weeds are to be managed prior to direct seeding. A temporary nurse crop such as <u>sterile</u> ryecorn can be used to stabilise the soil and suppress weeds during establishment if required. • As far as is practical, any machinery used for direct seeding works should avoid driving over rehabilitation sites, particularly when the soil is moist, or tyres leave compressions in the soil. • Soil disturbance has the potential to trigger germination from the soil seed bank. Initial watering of the rehabilitation site may be important for initiating germination.

Method	Description
	- Following its establishment, the rehabilitation site is to be thoroughly watered. - If direct seeding efforts are insufficient or unsuccessful, consideration should be given to supplementary planting and/or additional applications of direct seeding of provenance native species to establish a native species cover. The requirement for supplementary planting should be assessed in conjunction with monitoring of site rehabilitation works.

Monitoring of natural regeneration (rehabilitated) areas and associated reporting will occur in accordance with Appendix H: Flora and Fauna Monitoring Program. Where monitoring determines that rehabilitation through natural regeneration is ineffective, consideration will be given to additional measures to supplement and assist natural regeneration such as direct seeding where practical and feasible.

7.13 DETERRENT DEVICES

UMM B11 requires conductor line-marking techniques to be implemented to minimise bird strikes. Bird diverters (i.e. 'flappers') have been selected and are discussed below.

7.13.1 LOCATIONS

Fauna deterrent locations are to be finalised during design refinement but at a minimum are considered warranted based on the distribution and nature of avifauna records, and nearby suitable waterbird habitat (within 1km) to reduce impacts on aerial fauna species from collision and allow safer passage within these areas and any known stick nests. TransGrid will undertake a review of the risk of collision with transmission lines by highly mobile species including threatened Forest Owls, Raptors and Cockatoos, Migratory Birds, Grey-headed Flying-fox and microbats and gliders to determine the location and type of adaptive management measures for collision-risk species. Deterrent strategies would include bird flappers and perching deterrents to deter avifauna effectively and safely away from energized infrastructure, development of a diverter model and a monitoring program.

The review will be completed in consultation with CPHR within six months of the commencement of construction. The outcomes of the review of the risk of collision would be incorporated into the Connectivity Strategy in the BMP prior to the commencement of stringing.

Annual monitoring will be undertaken to ensure any damaged or missing deterrents are replaced.

7.13.2 DESIGN STANDARDS

The two potential types of bird diverters currently proposed are identified in Figure 12, though will be subject to change during the detailed design process. The device will have minimum performance requirements such as ability to spin 360 degrees, high-visibility strips on all sides of the device. The spacings of the bird diverters installed on the lines will be . The diverters will be installed via drone (UAV) or by clamping (hot stick).



Figure 12. Firefly (left) and Afterglow (right) bird diverters.

7.14 SPECIFIC BIODIVERSITY PROCEDURES AND PLANS

In accordance with the CoA and UMMs, Table 32 lists biodiversity procedures and plans that have been developed by or in consultation with the Project Ecologist:

Table 32. Biodiversity Protocols, procedures and plans developed to manage biodiversity impacts.

Protocol, procedure, plan	Document Reference
Appendix A: Unexpected Species Finds Protocol	If any threatened species or threatened ecological community are unexpectedly encountered, Appendix A: Unexpected Species Finds Protocol will be implemented.
Appendix B: Vegetation Clearing Procedures	Pre-clearing surveys of the clearing extent will be undertaken prior to clearing by the Project Ecologist. All areas that need to be cleared will be subject to staged or non-staged clearing. Staged clearing occurs in locations where the ecologist identifies habitat and is typically referred to as 'two-stage clearing'. The pre-clearing survey and clearing will be undertaken in accordance with Appendix B: Vegetation Clearing Procedures.
Appendix C: Fauna Handling and Rescue Procedures	Fauna handling and rescue will be guided by Appendix C: Fauna Handling and Rescue Procedures.
Appendix D: Biosecurity Management Plan	The risk of weed and pathogen spread is generally highest during the earthworks phase of construction, due to the high frequency of vehicle movements and disturbance of ground cover and soil, which could lead to weed growth. Some pathogens and species of weeds are readily spread by vehicles, machinery and human activity. The management of biosecurity matters is based on managing the risk of introducing new weeds and pathogens to Project work areas during the construction phase due to Project activities. Safeguards and management measures will be implemented to avoid, minimise or manage impacts from the introduction and spread of weeds and pathogens as detailed in Appendix D: Biosecurity Management Plan.
Appendix E: Supplementary Hollow and Nest Strategy	During pre-clearing surveys, the Project Ecologist will survey and document tree hollows, nests and other habitat features within the proposed clearing extent as outlined in Appendix B: Vegetation Clearing Procedures. If the surveys identify tree hollow habitat within the disturbance area, replacement hollows will be informed by Appendix E: Supplementary Hollow and Nest Strategy. Monitoring of artificial hollows is detailed in Appendix H: Flora and Fauna Monitoring Program.

Protocol, procedure, plan	Document Reference
Appendix F: Connectivity Strategy	A wildlife corridor or connectivity corridor is an area of habitat connecting wildlife populations separated by human activities or structures (such as roads or easements). Wildlife corridors are a link of wildlife habitat, generally native vegetation, that connect two or more larger areas of similar habitat. Wildlife corridors can range in size from small, local corridors, to large corridors that stretch across various landscapes. Connectivity of habitat is essential for the long-term survival of many species because it facilitates fauna movement on a local scale, for foraging and sheltering, as well as on a regional scale as a wildlife corridor for dispersal and migration. The Connectivity Strategy will be implemented for the Project and is provided in Appendix F: Connectivity Strategy.
Appendix G: Threatened Insect Habitat Rehabilitation Plan	Golden Sun Moth (<i>Synemon plana</i>) distribution is correlated with grasslands dominated by low-growing wallaby grasses (<i>Rytidosperma</i> spp.) and has contracted substantially over time. Golden Sun Moth are now only found in a few relatively small breeding areas due to habitat loss, fragmentation and degradation. Key's Matchstick Grasshopper (KMGH) is distributed in native grasslands, savannah woodland country and between this and the sclerophyllous forests, mainly in vegetation associations of kangaroo grass (<i>Themeda triandra</i>) that provides shelter and daisies (mostly Asteraceae) as a source of food. However, the species is also known to colonise exotic grasslands. Key's Matchstick Grasshopper (<i>Keyacris scurra</i>) was opportunistically recorded during the field survey in the Murrumbateman IBRA subregion. It is assumed present as it has a moderate likelihood of occurrence within at least the Inland Slopes IBRA subregion due to the presence of suitable grassland habitat and Atlas records within the vicinity of the amended Project footprint. The Golden Sun Moth was not detected during field surveys; however, it is assumed present as it has a high likelihood of occurrence and is known to occur in the Murrumbateman and Inland Slopes IBRA subregions due to the presence of suitable grassland habitat and with multiple sightings across records within 5 km the amended Project footprint in suitable grassland habitat. A Threatened Insect Habitat Rehabilitation Plan (per UMM B9) for habitat temporarily disturbed during construction is provided in Appendix G: Threatened Insect Habitat Rehabilitation Plan.
Appendix H: Flora and Fauna Monitoring Program	Biodiversity monitoring during construction and associated reporting is detailed in the Appendix H: Flora and Fauna Monitoring Program.

7.15 MANAGEMENT AND MITIGATION MEASURES

Management and mitigation measures relevant to the Project are summarised in Section 7.15. These will be implemented to minimise impacts to biodiversity and ensure all commitments and requirements of the Project approval are met. These specific management and mitigation measures have been developed to address the requirements of applicable legislation, the CoA and the commitments of the UMMs.

Table 33. Biodiversity management and mitigation measures

ID	Measure/Requirement	Threatened Species Applicable*	When to implement	Responsibility	Reference
BD1.	Training will be provided to all Project personnel, including relevant sub-contractors on biodiversity management practices and the requirements from this BMP through inductions, toolbox talks and activity-specific training.	All species	Pre-construction	HSSE Manager	UMM B14, UMM B13, UMM B3
BD2.	Any site offices or crib sheds that may be required will be located in an area of limited biodiversity value where possible (e.g. cleared land or areas of native vegetation with vegetation integrity scores of less than 17 (in accordance with the NSW Government Biodiversity Assessment Method Operational Manual) will be prioritised).	All species	Detailed design	Design Manager Construction Manager Environment and Sustainability Manager	UMM B1, UMM B2, UMM B9, UMM B28
BD3.	Where construction activities are required in areas of native vegetation that have not previously been subject to biodiversity survey, supplementary biodiversity survey will, where possible, be carried out prior to disturbance to inform detailed design and micro-siting opportunities, adherence to clearing limits and biodiversity offsetting requirements. Surveys will be carried out by a suitably qualified ecologist.	All species	Pre-construction Construction	Transgrid Environment and Sustainability Manager Ecologist	UMM B4
BD4.	Should changes to the Project's design or construction methodology or additional field surveys result in changed impacts to biodiversity that have not been included in the Revised BDAR, these would be assessed in accordance with the requirements of the BAM by an accredited assessor.	All species	Detailed design Pre-construction	Environment and Sustainability Manager Ecologist	UMM B4
BD5.	Aquatic ecological assessment will be undertaken at any further or alternative waterway crossings required in areas mapped as KFH or indicative threatened species distribution mapping (DPI 2022) consistent with the EIS and address any potential impacts to threatened aquatic species or KFH.	Aquatic species	Construction	Environment and Sustainability Manager Ecologist	UMM B34

ID	Measure/Requirement	Threatened Species Applicable*	When to implement	Responsibility	Reference
BD6.	Clearing of native vegetation and key habitats will be minimised where possible. This will include minimising impacts to the clearing of hollow-bearing trees, threatened species as well as native vegetation and key habitat. Clearing will conserve mid and ground-story vegetation in the ECZ and HTZ where practicable. Additional vegetation clearing requirements in areas of threatened groundcovers (e.g., orchids) may be required. Opportunities to minimise clearing will occur through a review of temporary design and construction methodologies for the disturbance area.	All species	Detailed design Pre-construction Construction	Environment and Sustainability Manager Construction Manager Design Manager Supervisor Engineer	CoA B25, CoA B30, UMM B3, UMM B1
BD7.	Unless otherwise agreed with the Planning Secretary, clearing is not to exceed the limits identified in Section 7.6 of this BMP. Spatial data and threatened species locations will be provided to the detailed design team and for use in construction planning.	All species	Pre-construction Construction	Design Manager Construction Manager Environment and Sustainability Manager Supervisor	CoA B25, CoA B30
BD8.	Detailed design and construction methodologies will avoid impact on matters of biodiversity conservation significance to the greatest extent practicable. Micro-siting of the transmission line infrastructure and associated construction working areas and other areas of disturbance (e.g. blasting and rock crushing sites, if required) will occur to avoid impacts wherever practicable. Threatened species recorded and their habitat will be given the highest priority in terms of impact minimisation through detailed design with construction methodologies limiting clearing wherever possible and delineating their habitat outside the final disturbance area as no-go zones. Threatened species and their habitats, as well as endangered threatened ecological communities and constraints mapping will be identified through the GIS and environmental control maps	All species	Detailed design Construction	Design Manager Environmental Advisor Environment and Sustainability Manager Construction Manager	UMM B1, UMM B27, UMM B20, UMM B13

ID	Measure/Requirement	Threatened Species Applicable*	When to implement	Responsibility	Reference
	(ECMs) (per Section 3.4.5 of the CEMP). The results of pre-clearing surveys will be used to update and confirm the accuracy of the GIS and ECMs. ECMs will be provided to the construction workforce.				
BD9.	Biodiversity constraints mapping will be used to prioritise avoidance of high biodiversity conservation significance areas (e.g., SALLs, CEECs) where practicable. Areas of moderate, high, very high and/or no-go biodiversity constraints will be prioritised for impact avoidance during detailed design and construction. Work areas of moderate, high, very high and/or no-go biodiversity constraints which are not impacted will be designated as exclusion/no-go zones on ECMs and will be fenced (when works are occurring in the vicinity) to avoid incursion. Plant, equipment and machinery will be fitted with GPS trackers and alarms, where feasible, to alert staff when approaching areas of moderate, high, very high and/or no-go biodiversity constraints Training on environmental constraints (including areas of moderate, high, very high and/or no-go biodiversity constraints) will be provided to all project personnel, including relevant subcontractors through inductions, toolboxes and targeted training.	All species	Detailed design Construction	Design Manager Environmental Advisor Environment and Sustainability Manager Construction Manager	UMM B1
3D10.	Where threatened frog (including Booroolong Frog) habitats are identified, works will avoid installing waterway crossings and avoid disturbance within 50 m of the top of bank of the waterway (including riparian vegetation). Where avoidance is not possible: Waterway crossing designs should avoid instream structures to minimise impacts of downstream environments.	Amphibians	Detailed design and construction	Design Manager Environmental Advisor Environment and Sustainability Manager Construction Manager Ecologist	UMM B8

ID	Measure/Requirement	Threatened Species Applicable*	When to implement	Responsibility	Reference
	- Waterway crossing locations will be determined in consultation with a suitably qualified Ecologist to avoid or minimise impacts to potential habitats or ecological features. - Site specific erosion and sedimentation control plans will be developed to ensure potential erosion and sedimentation impacts are minimised, including monitoring the success of erosion and sediment control measures. - Site-specific hygiene protocols will be developed and implemented to minimise the spread of pathogens and exotic weeds during and post-construction (in line with Hygiene protocols for the control of diseases in Australian frogs [DCCEEW, 2011]). A suitably qualified ecologist will be engaged to undertake monitoring surveys for the species at the crossing site and in downstream receiving environments in consultation with the BCS.				
3D11.	During detailed design, micro-siting of infrastructure requiring sub-surface work, such as transmission line structure footings and access tracks will occur to minimise prescribed impacts and impacts to native vegetation, breeding and sheltering habitat for fauna, including habitat trees and rocky habitats and avoid impacts to groundwater dependent ecosystems (GDEs) and aquatic habitats and aquifers. Access track corridor establishment will consider terrain and follow the natural contour of the land as far as practicable to minimise cut/fill, soil disturbance and vegetation clearing. Trees will be removed as close as possible to ground level and root balls will be left in situ wherever practicable. Erosion control mechanisms will be put in place during the initial track construction work to	All species	Detailed design and construction Prior to the commencement of construction in accordance with Transgrid's Maintenance Plan – Easement and Access Tracks.	Design Manager Construction Manager Environment and Sustainability Manager	UMM B28, UMM B29, UMM B17, CoA B25, CoA B30

ID	Measure/Requirement	Threatened Species Applicable*	When to implement	Responsibility	Reference
	contain sediment that may erode from the disturbed surfaces. Restoration of disturbed areas within lands of high biodiversity significance including connectivity corridors, intact vegetation remnants and breeding habitat for fauna, including threatened species and ecological communities will be prioritised. Access tracks will be used as necessary for the construction work and as far as is practicable, construction will cause minimum disturbance to soil and vegetation both on and adjacent to the track. For any temporary access tracks, the disturbed surfaces and formed areas will be revegetated in accordance with the approved CEMP or Managing Urban Stormwater: Soils and Construction - Volume 2C Unsealed Roads (DECC, 2008a).				
3D12.	An appropriately qualified arborist will undertake Hazard tree inspections prior to the commencement of construction in accordance with Transgrid's Maintenance Plan – Easement and Access Tracks. To minimise impacts, opportunities for individually assessing and selectively clearing hazard trees will be considered further during detailed design.	All species	Detailed design and construction	Design Manager Construction Manager Environment and Sustainability Manager	UMM B21
3D13.	Particular focus to minimising ground disturbance will be implemented for the following areas: - Steep or Highly Erodible lands where slopes are in excess of 18 degrees from the horizontal - Protected Riparian Land (PRL) defined as land within 20 m of the bed or bank of a prescribed stream. Generally, named watercourses are classed as protected riparian land; however, some unnamed	All species	Construction	Design Manager Construction Manager Environment and Sustainability Manager	UMM B17

ID	Measure/Requirement	Threatened Species Applicable*	When to implement	Responsibility	Reference
	watercourses may be classed as protected riparian land - Waterfront land (40 m from the top of bank) - In areas where large rock outcrops are prevalent on the easement. Hazard trees identified from the LiDAR assessment will be flagged for removal, and any adjacent and important habitat trees and features identified for retention will be clearly marked and included in maps within the CEMP to avoid disturbance during the felling activities.				
3D14.	Works within the Tree Protection Zones of retained trees within or immediately adjacent to the disturbance area would be planned with consideration of the tree protection measures outlined in AS4970–2009 Protection of Trees on Development Sites where practicable and appropriate measures would be implemented to minimise the impact of the works on the long-term health of these trees	All species	Pre-construction	Environmental Advisor Environment and Sustainability Manager Construction Manager Supervisors	Good Practice
3D15.	Pre-clearing surveys will be completed prior to clearing at each location by a suitably qualified and experienced ecologist in accordance with Appendix B: Vegetation Clearing Procedures.	All species	Pre-construction	Environmental Advisor Environment and Sustainability Manager Ecologist	CoA B30, UMM B20, UMM B3
3D16.	Biodiversity exclusion zones and unexpected find locations for retained vegetation, threatened species and their habitat would be confirmed by a suitably qualified ecologist and identified as 'No disturbance' zones prior to the commencement of clearing or any site activity that could damage the vegetation within the exclusion zone. Biodiversity exclusion zones would be physically marked and demarcated, and included on environmental control maps and within approved plans prior to clearing	All species	Pre-construction	Environmental Advisor Environment and Sustainability Manager Ecologist	UMM B13, UMM B20, UMM B3

ID	Measure/Requirement	Threatened Species Applicable*	When to implement	Responsibility	Reference
3D17.	Detailed design and construction methodologies will be implemented for areas with known SAI entities to reduce and avoid impacts. Intact and/or higher condition remnants will be prioritised for avoidance incorporating consideration of connectivity between retained remnants. Construction methodologies will include the use of A-Frame Fence Hurdles, drones and/or helicopters when stringing transmission lines within locations with recorded threatened flora species and/or walking the rope and draw wire through on foot when traversing through.	All species	Detailed design and Pre-construction	Environmental Advisor Environment and Sustainability Manager Ecologist	UMM B6, UMM B7 CoA B30
3D18.	Vegetation clearing specific training will be provided to all Project personnel, including relevant sub-contractors, and will cover biodiversity management protocols and requirements for the Project. Environmental control maps (showing clearing boundaries and exclusion zones) and all updates as required will be provided.	All species	Pre-construction	HSEE Manager	UMM B14
3D19.	Activities within vegetated riparian zones will be undertaken in a way so to minimise impacts to aquatic environments. Shrub or ground stratum native vegetation within vegetated riparian zones (within the definition of Water Management Act 2000 and Guidelines for riparian corridors on waterfront land (DPI – Office of Water, 2012)) of defined riparian areas would be protected to the greatest extent practicable, with vegetation clearing ideally limited to the tree stratum only, with trunk bases being retained in-situ. Disturbance of bush rock in riparian areas will be avoided wherever practicable. Riparian areas subject to disturbance will be progressively stabilised and rehabilitated to resemble the pre-work condition and form wherever possible or alternatively to a stable design form, as appropriate following the completion of construction work.	All species	Construction	Environmental Advisor Environment and Sustainability Manager Ecologist Construction Manager	UMM B27, UMM B32

ID	Measure/Requirement	Threatened Species Applicable*	When to implement	Responsibility	Reference
3D20.	Design and micro-siting of Project infrastructure including transmission line structure benches, line towers and access tracks will be located and constructed to avoid or minimise impact to vegetated riparian corridors, protected areas (i.e. nature refuges) and conservation lands (i.e. established BioBank and Biodiversity Stewardship sites and Conservation Agreement sites) occurring within the Project footprint where practicable. The final transmission line easement will target narrow crossing points of waterways and riparian areas clear of vegetation.	All species	Detailed design and construction	Design Manager Environment and Sustainability Manager	UMM B27, UMM B2
3D21.	Detailed design and micro-siting processes will minimise impacts of water crossings to aquatic environments. Measures include: • Using or upgrading any existing crossings in preference to establishing new crossings • Minimising and avoiding disturbance to waterways • Design and construction works will minimise disturbance to any native vegetation, including native instream, fringing, and riparian vegetation within the access track alignment • Waterway crossings will be constructed perpendicular to the flow of the water and be positioned away from channel bends (where erosive forces are typically greatest). Crossings will preferably be in straight stream sections with well-defined channel geometries and shallow stream gradients, in stable dry reaches • Micro-siting will avoid direct and indirect (erosion or sedimentation) impacts to riverine features such as riffles and rapids and sensitive habitat features (i.e. snags, coarse woody debris, instream macrophytes, boulders)	All species	Detailed design and construction	Design Manager Environment and Sustainability Manager	UMM B30, UMM B31

ID	Measure/Requirement	Threatened Species Applicable*	When to implement	Responsibility	Reference
	Where instream structures are required, considerations to potential flooding and erosive effects will be made in the design and construction of the crossing. Crossing structures will be designed so that the existing nominal flow velocity, low flow conditions and fish passage are maintained wherever possible. This will include the following considerations: • Minimise the impact of essential instream structures by mimicking natural flows (DPI, 2005b) • Following Fairfull (2013), for waterway crossings incorporating culverts, a minimum of 300 mm of water should pool through the structure, with a centrally placed low-flow cell being preferable • In line with Cotterell (1998), it is recommended that flow over or through instream crossing structures are designed such that they maintain water velocity of 0.3 m/s or less, which is likely to facilitate passage for native species of fish (velocities exceeding 1 m/s, are likely to prevent upstream migration of native fish) Work near waterways will be undertaken to avoid impacts such as herbicide drift/overspray, erosion, and damage to the banks.				
3D22.	The need for and location of waterway crossings at identified CLASS 1 KFH locations would be confirmed during detailed design by the construction contractors. Crossing design would preference a single-span bridge structure where practicable (aligning with the recommended crossing types identified by NSW DPI Fisheries for CLASS 1 streams) to avoid instream impacts, particularly within threatened species potential distributions. Consultation with NSW DPI Fisheries (and Commonwealth DCCEEW for Riek's Crayfish, as required) as to crossing designs and the potential occurrence of	Aquatic species	Detailed design	Design Manager Environment and Sustainability Manager	UMM B33, UMM B3

ID	Measure/Requirement	Threatened Species Applicable*	When to implement	Responsibility	Reference
	threatened aquatic species to inform detailed design and survey will be undertaken.				
3D23.	Areas subject to partial clearance will be progressively monitored from the commencement of construction. A verification report that confirms partial clearance has been undertaken in accordance with procedures identified in Appendix B: Vegetation Clearing Procedure will be produced and provided every three months during construction to confirm the assumptions made in the BDAR regarding partial clearance within the Easement Clearing Zone and whether any changes are required to this Plan and Appendix B: Vegetation Clearing Procedures.	All species	Construction	Environmental Advisor Environment and Sustainability Manager Ecologist	CoA B30
3D24.	Detailed design will incorporate conductor line-marking techniques to minimise bird strikes within one kilometre of wetland/riverine habitats. Use of bird diverters, most likely of the “flapper” variety, will be implemented. Positioning and diverter models will be finalised during detailed design but at minimum, these will be used within one kilometre of wetland / riverine habitats to reduce impacts to aerial fauna species from collision and allow safer passage within these areas.	Bird and Bat species	Detailed design and construction	Design Manager Environment and Sustainability Manager	UMM B11
3D25.	The Unexpected Threatened Species Finds Procedure (Appendix B) will be implemented if threatened ecological communities and threatened flora and fauna species, not assessed in the biodiversity assessment, are identified in the disturbance area.	All species	Pre-construction and construction	All personnel	UMM B3, CoA B2
3D26.	Alternative roosting and/or nesting habitat for threatened fauna displaced during clearing and measures such as nest boxes, hollow re-use/creation, and re-use of timber/logs within the transmission line easement will be provided in accordance with a Supplementary Hollow and	Hollow-dependent species	Pre-construction and construction	Environment and Sustainability Manager Ecologist	UMM B12

ID	Measure/Requirement	Threatened Species Applicable*	When to implement	Responsibility	Reference
	Nest Strategy (Appendix E). The strategy will include: • A survey of tree hollows and nests within the proposed clearing extents • The target species, size, type, number and suitable location of nest boxes/hollows based on the results of the ecological surveys • Appropriately sized nest boxes/hollow replacements will be installed as close to cleared areas as possible (subject to landowner agreement and suitable trees being present) as early as practicable prior to clearing activities • Nest boxes will include consideration of natural tree hollow re-use and new tree hollow creation • Records of the type, height, orientation and location of nest boxes installed as spatial data and provided to Transgrid • An annual monitoring program to assess the efficacy of supplementary habitat measures throughout the construction phase				
3D27.	Construction works including access tracks will avoid and minimise disturbance of connectivity corridors and favour existing access wherever possible. Connectivity Corridors will be considered at key riparian crossings, in areas of the transmission line joining proposed biodiversity stewardship sites and or conservation reserve estates and at transmission line structure locations that occur in woodland vegetation at strategic locations. The Project will establish a series of 20-metre-wide connectivity corridors near tower locations that occur in woodland vegetation in accordance with the Connectivity Strategy (Appendix F). The connectivity corridors will involve native vegetation retention up to the 10-metre-wide temporary construction centreline clearing zone	All fauna species	Detailed design and construction	Environment and Sustainability Manager	UMM B10, CoA B30

ID	Measure/Requirement	Threatened Species Applicable*	When to implement	Responsibility	Reference
	to better facilitate woodland connectivity. In addition to the connectivity corridors, under transmission glider poles will be installed in accordance with the Connectivity Strategy to assist Squirrel Glider movement. Connectivity measures such as fauna sensitive structures (i.e. under transmission glider poles), vegetation stepping stones, or reduced clearing will be considered within the Project footprint. Glider connectivity opportunities will be considered in at least six locations within the Project footprint that align with glider corridors and opportunities identified in the glider memo (Niche, 2023).				
3D28.	Fauna habitat such as logs, tree hollows, bush rock, rocky outcrops, surface rock, dead wood, logs, coarse woody debris and boulders will be temporarily relocated and stockpiled during construction and re-used within suitable woodland and aquatic habitats where available and feasible. Opportunities to retain felled trees as habitat on easement will be considered in select areas (i.e. connectivity corridors and riparian lands). The opportunity to stockpile and supply felled trees for Key Fish Habitat rehabilitation or improvement works would be discussed with DPI Fisheries.	All species	Construction	Environment and Sustainability Manager	UMM B19, UMM B35, UMM B3
3D29.	Trees within the boundaries of State forests, Crown Lands, Travelling Stock Reserves, public roads or within 40 m of the bank of any river will be disposed of strictly in accordance with the requirements of the appropriate authorities.	All species	Construction	Environment and Sustainability Manager	UMM B19
3D30.	The biosecurity controls outlined in the Biosecurity Management Plan (Appendix D) will be implemented during construction to minimise the risk of off-site transport or spread of disease, pests or weeds and reporting, monitoring and management obligations. Controls include but	All species	Construction	Environment and Sustainability Manager Environmental Advisor Construction Manager Supervisor	UMM B22, CoA B2, CoA 26, UMM B3

ID	Measure/Requirement	Threatened Species Applicable*	When to implement	Responsibility	Reference
	are not limited to inspections and cleaning of vehicles, machinery, and personnel equipment prior to movement on and off the construction work areas. Additional measures where localised areas of high biosecurity risks have been identified will be implemented. The effectiveness of these controls will be regularly monitored.				
3D31.	Where present in locations that would be accessed for construction activities, weeds would be managed in consultation with the relevant landholder. Consultation would also occur with the relevant authority Local Land Services (LLS), the relevant local council, or NSW DPI in relation to notifiable weeds.	All species	Construction	Environment and Sustainability Manager Environmental Advisor Construction Manager Supervisor	Good Practice
3D32.	In the event of new infestations of notifiable weeds as a result of construction activities, the relevant control authority will be notified as per the Biosecurity Act 2015 and Biosecurity Regulation 2017.		Construction	Environment and Sustainability Manager	UMM B3, UMM B22
3D33.	Soil and water quality management measures will be implemented in accordance with the Project's Soil and Water Management Plan (HLE-AGJ-MGT-ALE-PLN-0000-00028) to minimise erosion during clearing. In addition to standard erosion and sediment control measures, the following procedures and considerations will be incorporated into construction methodologies for waterway crossings, where appropriate and practicable: • Minimise disturbance to native vegetation • Waterway crossing work will be constructed during no or low flow conditions • Silt curtains or coffer dams will be deployed around instream work sites where required • Flow diversion measures will be installed on bunded waterway crossings as appropriate or where construction during no or low flow conditions is not feasible	All species	Pre-construction and construction	Environment and Sustainability Manager Construction Manager Supervisor Engineer	CoA B30, UMM B35

ID	Measure/Requirement	Threatened Species Applicable*	When to implement	Responsibility	Reference
	• Appropriate erosion and sediment controls that take into account the potentially flood prone areas will be employed • Waterway bed and bank material excavated during construction will be stockpiled outside of the active channel and avoid riparian vegetation • If the stockpiling of sediment or soil is required, it will be located as far away from waterways as practicable and managed so that it is secure against flooding and runoff • Only excavated natural materials (ENM) or virgin excavated natural materials (VENM) will be used as fill during reclamation work • Chemicals will be stored in adequate bunding • Plant refuelling will occur as far away from streams as possible and appropriate spill prevention measures will be implemented when refuelling.				
3D34.	Soil and water quality management measures will be implemented in accordance with the Soil and Water Management Plan to avoid, manage and mitigate impacts to surface water, groundwater, soils and manage disturbed lands and areas and their revegetation. An Erosion and Sediment Control Strategy has been provided in Appendix D of the Soil and Water Management Plan in line with the principles and requirements in: • Managing Urban Stormwater – Soils and Construction, Volume 1 (Landcom 2004), commonly referred to as the 'Blue Book' • Managing Urban Stormwater – Soils and Construction, Volumes 2A and 2C (NSW Department of Environment, Climate Change and Water 2008) • Best Practice Erosion and Sediment Control (IESCA – 2008) • Transgrid's Environmental Guidance Notes	All species	Construction	Environment and Sustainability Manager Construction Manager	CoA B30, UMM B18, UMM B26

ID	Measure/Requirement	Threatened Species Applicable*	When to implement	Responsibility	Reference
	- Controlled Activities - Guidelines for instream works on Waterfront Land (DPE Water, 2022b) The ESCS will be implemented to guide the development of the Progressive Erosion and Sediment Control Plans (PESCPs) for the Project. Measures in the strategy include but are not limited to: - Vegetation removal, restoration, and management - Stockpiling, erosion, and sediment management - Stabilisation/rehabilitation of disturbed lands/areas - Installation and maintenance of temporary erosion and sediment controls until rehabilitation measures provide effective stabilisation of disturbed lands/areas All disturbed areas will be stabilised/rehabilitated to a standard either as agreed with the landowner or in accordance with the relevant Managing Urban Stormwater (Blue Book) or comparable best practice guidelines.				
3D35.	All disturbed areas will be stabilised/rehabilitated to a standard either as agreed with the landowner or in accordance with the relevant Managing Urban Stormwater (Blue Book) or comparable best practice guidelines. Temporary disturbance within Golden Sun Moth and Key's Matchstick Grasshopper habitat will be rehabilitated in accordance with Appendix G: Threatened Insect Habitat Rehabilitation Plan.	All species	Construction	Environment and Sustainability Manager Construction Manager Supervisor	UMM B18, UMM B3
3D36.	The Project will ensure that: All activities on waterfront land are constructed in accordance with the Guidelines for Controlled Activities on Waterfront Land (2012), Why do Fish Need to Cross the Road? Fish Passage	All species	Construction	Environment and Sustainability Manager Environmental Advisor Construction Manager Supervisor	CoA B22

ID	Measure/Requirement	Threatened Species Applicable*	When to implement	Responsibility	Reference
	Requirements for Waterway Crossings (NSW Fisheries 2003) and the Policy and Guidelines for Fish Habitat and Conservation and Management (NSW Fisheries, 2013), unless DPE Water agrees otherwise The geomorphic condition of the major rivers and distributary channels crossed by the Project is not impacted.				
3D37.	Construction activities will be managed in accordance with the Bushfire and Emergency Management and Evacuation Plan (HLE-AUR-ENV-ALE-PLN-0000-00001). The BFEMEP includes measures to minimise the potential for bushfire risk and will be prepared in consultation with Rural Fire Service. It will be made publicly available upon approval.	All species	Construction	Environmental Advisor Environment and Sustainability Manager	CoA B30
3D38.	Detailed design specifications will be adopted to ensure conductor clearance heights adhere to recommended levels to minimise any risk of arcing or potential fire events.	All species	Detailed design Pre-Construction	Design Manager Environment and Sustainability Manager	AMM1
3D39.	Monitoring and adaptive management measures will occur in accordance with Section 8 of this BMP.	All species	As per the frequency in Section 7.15	Environment and Sustainability Manager Ecologist	CoA B30, UMM B3, UMM B8
3D40.	Directional lighting used for any permanent lighting or temporary lighting (i.e. worker accommodation) required will minimise light spill as much as possible in accordance with Australian standard AS4282:2019. Permanent lighting will be erected at least 50 m from remnant vegetation where practicable. Artificial lighting required during construction will be directed towards the work site and minimise light spill, to the extent practicable.	All species	Construction	Construction Manager Supervisor	UMM B24
3D41.	Extent of native vegetation clearing will be tracked to confirm actual impacts to biodiversity values to inform any final biodiversity offset requirements and allow for comparison of actual	All species	Pre-construction and construction	Environmental Manager Transgrid (offsets)	UMM B15

ID	Measure/Requirement	Threatened Species Applicable*	When to implement	Responsibility	Reference
	clearing with the predicted clearing extents outlined in the Revised BDAR. All GIS data of high biodiversity significance will be provided to Transgrid to inform operational phase management and future activities.			Environment and Sustainability Manager Ecologist	
3D42.	Pre-construction surveys at CLASS 1 streams identified as supporting potential habitats for threatened species at the site of proposed new tracks or upgraded tracks will be undertaken to determine: • The presence/absence or likelihood of threatened aquatic species occurring • Completion of an updated 7-part test or SIA assessment, as relevant • Determine any additional mitigation measures e.g. timing of works outside the breeding season where possible • Recommendations as to micro-siting and design in order to minimise potential impacts to threatened aquatic species.	Aquatic species	Detailed design Pre-Construction	Design Manager Environment and Sustainability Manager Ecologist	UMM B33, UMM B3
3D43.	Opportunities to avoid and minimise impacts to Golden Sun Moth and Key's Matchstick Grasshopper within transmission line easements will be considered in detailed design and implemented during construction.	Recorded Insects	Detailed design Construction	Design Manager Environment and Sustainability Manager	UMM B9
3D44.	Before blasting and/or crushing activities occur, an ecologist will determine potential impacts on Bats, Owls, Cockatoos, Raptors and Superb Parrot and complete an impact assessment of proposed activities with appropriate mitigation measures required if impacts are likely.	Bats, Owls, Cockatoos, Raptors and Superb Parrot	Construction	Environment and Sustainability Manager Construction Manager Supervisor Ecologist	UMM B25
3D45.	Seed from Rice Flower (<i>Pimelea bracteata</i>) will be collected before clearing and propagated for use in revegetation and rehabilitation across the Project area per 'AAM - HumeLink's SAIL - letter to BCD - September 2024_FINAL_v1'.	Rice Flower (<i>Pimelea bracteata</i>)	Pre-Construction	Environmental Manager Ecologist Construction Manager	CoA B30
3D46.	Ancillary activities and infrastructure such as laydown, brake and winch, stockpiles and	All species	Detailed design Construction	Environmental Manager	Best Practice

ID	Measure/Requirement	Threatened Species Applicable*	When to implement	Responsibility	Reference
	sediment basin locations will be located within the total clearing zone footprint, or otherwise prioritised in areas of no or low biodiversity constraint, to the greatest extent practicable.			Ecologist Construction Manager	
3D47.	Impacts on short-term or long-term post-fire refuges, (i.e., unburnt habitat within or adjacent to recently burnt landscapes that allow the species to persist and recolonise burnt areas where possible) will be avoided and mitigated through detailed design and construction.	Petauroides volans (Greater Glider)	Detailed design Construction	Design Manager Environmental Manager Ecologist Construction Manager	AMM1
3D48.	Mitigation measures are required to reduce these impacts on the species, including retaining (where possible) hollow bearing trees and avoiding areas of high hollow-bearing tree density during finalisation of detailed design. If hollows must be removed, nest boxes should be implemented, monitored and maintained.	Petauroides volans (Greater Glider)	Detailed design Construction	Design Manager Environmental Manager Ecologist Construction Manager	AMM2
3D49.	Control the spread of invasive species is detailed in Appendix D: Biosecurity Management Plan.	Melanodryas cucullata cucullata (South-Eastern Hooded Robin)	Pre-Construction Construction	Environmental Manager Ecologist	AMM3
3D50.	Development of a pest species monitoring program may be required if there is a substantial occurrence of large intact remnants and threatened species habitat within or adjacent to the disturbance areas.	Petaurus australis (Yellow-bellied Glider)	Pre-Construction Construction	Environmental Manager Ecologist	AMM4
3D51.	Mitigation measures to control the spread of weeds and pest animals are detailed in Appendix D: Biosecurity Management Plan.	Aphelocephala leucopsis (Southern Whiteface) Stagonopleura guttata (Diamond Firetail) Pycnoptilus floccosus (Pilotbird) Calidris acuminata (Sharp-tailed Sandpiper)	Pre-Construction Construction	Environmental Manager Ecologist	AMM5

ID	Measure/Requirement	Threatened Species Applicable*	When to implement	Responsibility	Reference
3D52.	Mitigation measures to manage feral and invasive pest plants and animals are detailed in Appendix D: Biosecurity Management Plan.	Melanodryas cucullata cucullata (South-Eastern Hooded Robin) Polytelis swainsonii (Superb Parrot)	Pre-Construction Construction	Environmental Manager Ecologist	AMM6
3D53.	Where feasible, removal of feed trees; Eucalyptus melliodora, Eucalyptus albens and Eucalyptus sideroxylon will be avoided via pre-clearance surveys of updated indicative disturbance area within 20 kilometres of a known camps, and support PCTs 266, 268, 277, 278, 280, 1330 and 283.	Pteropus poliocephalus (Grey-headed Flying-fox)	Detailed design Pre-construction Construction	Design Manager Environmental Manager Ecologist Construction Manager	AMM8
3D54.	During construction and operation, the amended project would implement the required bushfire management measures, including a Bush Fire Emergency Management and Evacuation Plan, to manage any increased risk of bushfire.	PCT's 268, 280, 283, 301, 679, 939, 953, 1097, 1107, 1330	Detailed design Construction	Design Manager Environmental Manager Ecologist Construction Manager Transgrid (Operational)	AMM9

*Threatened species are detailed in Table 16, Table 17 and Table 18.

8. COMPLIANCE MANAGEMENT

8.1 ROLES AND RESPONSIBILITIES

The Project Team's organisational structure and overall roles and responsibilities are outlined in Section 3.5 of the CEMP. Specific responsibilities for the implementation of environmental controls are detailed in Section 7.15 of this BMP.

8.2 TRAINING

All Project personnel, including employees, contractors and utility staff working onsite, will undergo site induction training relating to biodiversity management issues as per CoA A18. The induction training will address elements related to biodiversity management including:

- Existence and requirements of this BMP
- Requirements of the Environmental Work Method Statement (EWMS)
- Applicable and relevant legislation
- Roles and responsibilities
- Typical construction activities that may impact biodiversity and associated environmental impacts
- No-go zones and boundaries of clearing activities
- Procedures to be implemented in the event of an incident
- Mitigation and management measures
- Use of GIS and ECMs

Targeted training in the form of toolbox talks or specific training will be provided to personnel with a key role in biodiversity management. Examples of training topics include:

- Clearing procedures
- No-go zones
- Threatened species within the Project area
- Biodiversity exclusion zones
- Unexpected finds procedure for threatened species
- Biosecurity procedures.

Driver education regarding native fauna collision risks, including implementation of speed limits. Further details regarding the staff induction and training are in Section 3.6 of the CEMP.

8.3 MONITORING

The Project's monitoring program relevant to biodiversity is detailed in Appendix H: Flora and Fauna Monitoring Program. Monitoring requirements are summarised in Table 34.

Table 34. Monitoring program

Monitoring ID	Monitoring Requirement	Timing (Project Phase)	Responsibility
MON1	Partial Clearance Areas Progressive Monitoring	Construction	Project Ecologist Environment and Sustainability Manager
MON2	Weed, Pathogen and Pest Monitoring	Preconstruction Construction	Project Ecologist Environment and Sustainability Manager
MON3	Rehabilitation Monitoring	Preconstruction Construction	Environment and Sustainability Manager Ecologist
MON4	Threatened Flora Monitoring	Preconstruction Construction	Environment and Sustainability Manager Ecologist
MON5	Threatened Frog Monitoring	Preconstruction Construction	Environment and Sustainability Manager

Monitoring ID	Monitoring Requirement	Timing (Project Phase)	Responsibility
			Ecologist
MON6	Artificial Hollow Monitoring	Construction	Environment and Sustainability Manager Ecologist
MON7	Glide Pole Monitoring	Construction	Environment and Sustainability Manager Ecologist

8.4 INSPECTIONS

Weekly inspections will be performed by the environmental team and documented in the Weekly Environmental Checklist. The inspections will check the implementation and effectiveness of the management measures identified in Section 7.15 the environmental performance of the Project relevant to biodiversity. Visual monitoring of delineated/ fenced disturbance boundaries will be undertaken.

8.5 AUDITING

Audits (both internal and independent) will be undertaken to assess the effectiveness of environmental controls, compliance with this BMP, CoA and other relevant approvals, licenses, and guidelines. These audits will be undertaken at planned intervals to provide information on whether the Project:

- Is meeting its compliance obligations
- Conforms to this BMP
- Determines if this BMP is effectively implemented and maintained

The approach to internal and independent audits, including audit requirements and the auditing schedule, are detailed in Section 3.9.3 of the CEMP.

8.6 INCIDENTS AND NON-COMPLIANCES

All incidents and non-compliances will be managed in accordance with Section 3.8, Section 3.9.4 and Section 3.9.5 of the CEMP.

8.7 REPORTING

Project reports and responsibilities are documented in Section 3.9.6 of the CEMP. Specific biodiversity reporting requirements associated with the BMP are summarised in Table 35.

Table 35. Report requirements

Report	Timing	Responsibility	Recipient	Reference
Pre-construction Aquatic Biodiversity Survey Report	Preconstruction Once, within 3 months of completion of all surveys	Environment and Sustainability Manager Ecologist	Transgrid, ER DCCEEW	Section 7.6
Pre-clearing Report	Preconstruction Iteratively, within 3 months of the commencement of the relevant activity	Environment and Sustainability Manager Ecologist	Transgrid, ER	Appendix B Vegetation Clearing Procedure
Post-clearing Report	Construction Quarterly, within 3 months of completion of clearing for a given area	Environment and Sustainability Manager Ecologist	Transgrid, ER, CPHR	Appendix B Vegetation Clearing Procedure
Partial Clearance Verification Report	Construction	Environment and Sustainability Manager	Transgrid, ER	Appendix H: Flora and Fauna Monitoring Program

Report	Timing	Responsibility	Recipient	Reference
	Iteratively, within three months of partial clearing commencement	Ecologist		
Weed Monitoring Baseline Report	Preconstruction Within three months of monitoring completion	Environment and Sustainability Manager Ecologist	Transgrid, ER	Appendix H: Flora and Fauna Monitoring Program
Weed Monitoring Report	Construction Annually, within three months of monitoring completion	Environment and Sustainability Manager Ecologist	Transgrid, ER	Appendix H: Flora and Fauna Monitoring Program
Rehabilitation Baseline Monitoring Report	Preconstruction Within three months of monitoring completion	Environment and Sustainability Manager Ecologist	Transgrid, ER	Appendix H: Flora and Fauna Monitoring Program
Rehabilitation Monitoring Report	Construction Quarterly, within three months of monitoring completion	Environment and Sustainability Manager Ecologist	Transgrid, ER	Appendix H: Flora and Fauna Monitoring Program
Threatened Flora Baseline Monitoring Report	Preconstruction Within three months of monitoring completion	Environment and Sustainability Manager Ecologist	Transgrid, ER	Appendix H: Flora and Fauna Monitoring Program
Threatened Flora Monitoring Report	Construction Bi-annually, within three months of monitoring completion	Environment and Sustainability Manager Ecologist	Transgrid, ER	Appendix H: Flora and Fauna Monitoring Program
Threatened Frog Baseline Monitoring Report	Preconstruction Within three months of monitoring completion	Environment and Sustainability Manager Ecologist	Transgrid, ER	Appendix H: Flora and Fauna Monitoring Program
Threatened Frog Monitoring Report	Construction Bi-annually, within three months of monitoring completion	Environment and Sustainability Manager Ecologist	Transgrid, ER	Appendix H: Flora and Fauna Monitoring Program
Artificial Hollow Installation Report	Construction Once, post artificial hollow installation	Environment and Sustainability Manager Ecologist	Transgrid, ER	Appendix E: Supplementary Hollow and Nest Strategy
Artificial Hollow Monitoring Report	Construction Bi-annually, within three months of monitoring completion	Environment and Sustainability Manager Ecologist	Transgrid, ER	Appendix H: Flora and Fauna Monitoring Program
Glider Pole Monitoring Report	Construction	Environment and Sustainability Manager Ecologist	Transgrid, ER	Appendix H: Flora and Fauna Monitoring Program
Connectivity Corridor Validation Report	Preconstruction Once, within three months of validation completion	Environment and Sustainability Manager Ecologist	Transgrid, ER CPHR	Appendix F: Connectivity Strategy.
Threatened Insect Habitat Rehabilitation Monitoring Report	Annually	Ecologist	Transgrid , ER	Appendix G: Threatened Insect Habitat

Report	Timing	Responsibility	Recipient	Reference
				Rehabilitation Monitoring Report
Monitoring Report	As required	Environment and Sustainability Manager	Transgrid, ER	CoA B30

8.8 CONTINGENCY PLAN

Although the Project has been assessed through the environmental impact assessment process and potential impacts identified, unpredicted impacts may occur as the Project progresses. In the event that unexpected impacts are identified, the action or cause will be categorised and as required will be managed as:

- An emergency or environmental incident in accordance with Section 3.8 of the CEMP – Incidents and emergencies; and/or
- A non-compliance or non-conformance in accordance with Section 3.9.4 and Section 3.9.5 of the CEMP – Non-compliance and Non-conformance.

Reporting of the unpredicted impacts would be in line with the above processes and as described in Section 3.9.6 of the CEMP – Compliance Monitoring and Reporting.

The need for corrective and preventative actions may arise from incidents, audits, management reviews or other sources. The actions will be managed in accordance with the Project's environmental management system to ensure that the required actions are tracked and closed out in a timely manner. The completion of the required actions will be recorded and will include details on the source of the action (e.g., audit, inspection or other), the action required, target close-out date, actual close-out date and the person responsible.

The following steps will occur for corrective and/or preventative actions as relevant:

- determine the relevant impact assessment criterion/criteria, below which the impact should be reduced, consistent with the requirements of this NVMP
- identify options to reduce the unexpected impacts to below the relevant criterion/criteria and appropriate timeframe for implementation
- implement the selected measure(s) to reduce the unexpected impacts
- identify and implement an appropriate monitoring program to determine the effectiveness of the selected measure(s) to reduce the unexpected impact.

If monitoring identifies that the unexpected impacts have not been reduced to below the nominated criterion/criteria, items b) to d) of the contingency process will be repeated.

8.9 SPATIAL DATA MANAGEMENT

Controlled management of spatial data for biodiversity and other environmental constraints is critical for the project to ensure compliance with this BMP and other project requirements. The following spatial data sets are relied upon for constraints management and assessment of impacts within ECMs in accordance with this BMP and will be provided to the relevant agencies as required and/or upon request. These data sets are current at the time of preparation of this BMP, however further updates to these data sets are expected and will be controlled through a separate spatial data register maintained for the project. Any updates or new data sets will be advised to the relevant agencies as required.

An overarching data directory is maintained by TG, has already been supplied to CPHR. This will be updated within 3 months of having the BAVR approved and re-sent to CPHR. CPHR will be notified of any updated to the TG Data Directory.

Notes:

1. Updates to this data set are in development and will include revised extents determined through the Biodiversity Assessment Verification Reports prepared in accordance with CoA B29.

A data set directory for the project is found in Appendix I this data set is the basis of the project ECMs and mapping. The BMP data set will therefore be updated within 3 months of the BAVR approval and will be provided to CPHR within a updated revision of this Plan.

Additional data sets to be developed during construction will include actual partial clearance and outcomes of monitoring requirements set out in Appendix H: Flora and Fauna Monitoring Program.

9. REVIEW AND IMPROVEMENT

As outlined in Section 3.11.1 of the CEMP, management reviews will be undertaken as part of the continual improvement process. The reviews will be initiated by the Environment and Sustainability Manager and include relevant Project team members and stakeholders. Continuous improvement of this BMP and monitoring requirements will be achieved by the ongoing evaluation of environmental management performance against planning approval requirements, environmental policies, objectives and targets to identify opportunities for improvement.

The continuous improvement process will be designed to:

- Identify areas of opportunity for improvement of environmental management and performance
- Determine the cause or causes of non-conformances and deficiencies
- Develop and implement a plan of corrective and preventative action to address any non-conformances and deficiencies
- Verify the effectiveness of the corrective and preventative actions
- Document any changes in procedures resulting from process improvement
- Make comparisons with objectives and targets outlined in Section 2.2 of this BMP.

Any revisions to this BMP will be in accordance with the process outlined in Section 3.11 of the CEMP.

The BMP has been prepared in accordance with CoA B67:

- Within 4 months of the commencement of the Enabling Works, the Proponent must update the approved management plans for the development to incorporate any relevant aspects of the Enabling Works Management Plan, unless otherwise agreed by the Planning Secretary.

A copy of the updated Plan and changes will be distributed to all relevant stakeholders in accordance with the approved document control procedure – refer to Section 2 of the CEMP

9.1 ADAPTIVE MANAGEMENT

An adaptive management approach is to be employed with respect to the works forming part of this BMP. An adaptive management approach involves an integrated process of monitoring, reviewing and then responding to the efficacy of the methodology and management measures to identify any alterations to the design and maintenance of works that may be required to ensure the objectives of the Plan are achieved.

Where monitoring indicates that the construction works are having or could have a greater impact than approved, the Environment and Sustainability Manager in consultation with the Project Ecologist and relevant stakeholders (where required), will review the results of the monitoring program and take action as soon as reasonably practicable to prevent further impacts. This may include implementing measures such as a stop work, additional fauna fencing and delineation, additional training, changing construction methodology or redesigning certain elements of the Project.

The effectiveness of any corrective action will be determined through continued monitoring. The continued monitoring will occur in accordance with Appendix H: Flora and Fauna Monitoring Program, or as appropriate to the specific corrective action in addition to that already specified within the CEMP.

Monitoring detailed within Appendix H: Flora and Fauna Monitoring Program will commence upon the commencement of construction and continue at the timing or frequency detailed in detailed in Appendix H: Flora and Fauna Monitoring Program for each of the monitoring items. Reporting requirements for each monitoring type are detailed in Appendix H: Flora and Fauna Monitoring Program. A Trigger Action Response Plan (TARP) with triggers, actions and adaptive management measures and completion criteria is provided in Appendix H: Flora and Fauna Monitoring Program specific to monitoring requirements which monitors the performance of the Project against the objectives and targets provided in Table 2 of the Plan.

In some instances, corrective actions relating to specific issues may require changes to or additional management measures to those listed in This BMP. Where minor amendments to this BMP and/or CEMP are required, the ER may approve these amendments in accordance with CoA A13.

Amendments to these documents that are of a nature greater than minor will be subject to approval by the Planning Secretary and may require further government agency consultation.

9.2 TRIGGER ACTION RESPONSE PLAN

A Trigger Action Response Plan (TARP) with triggers, actions and adaptive management measures and completion criteria is provided in Table 36 which monitors the performance of the Project against the objectives and targets provided in Table 2 of the Plan.

Table 36. TARP and adaptive management

Project Location/ Work Area	Timing (Project Phase)	Feature	Objective	Responsibility	Baseline Data	Targets / Completion criteria	Performance indicators	Monitoring Method (how the performance indicator will be validated)	Record/Report	Frequency/ timing	Decision Trigger (measurable threshold)	Adaptive Action / Response
Biodiversity												
Disturbance footprint	Construction	N/A	Minimise and manage the impacts of the project on biodiversity.	Design Manager Construction Manager Environment and Sustainability Manager Ecologist	Clearing limits identified in Section 7.6	No exceedance to clearing values of known biodiversity including flora and fauna species as specified in CoA B25 and Appendix 2 of the Infrastructure Approval	Clearing limits to be within those set in CoA B25 and Appendix 2 of the Infrastructure Approval and Section 7.6 of this BMP	Total clearing area Clearing supervision	Clearing and Land Disturbance Permit Clearing and Land Disturbance Permit Register Pre-clearing Survey Reports Post-clearing Survey Reports.	Iteratively as clearing progresses. At a minimum monthly during initial clearing, then as required	Forecast clearing may exceed the clearing limits. Clearing limits exceeded through construction.	Stop work immediately if construction activities occur that result in unauthorised disturbance. Design or construction methodology to be reviewed to determine an approach that will avoid or minimise the forecast additional impacts to the relevant vegetation community. Design/construction methodology review to identify additional management measures that will reduce the re-occurrence of exceeded clearing. Review if further Project training is required and implement if needed. If an exceedance of the clearing limits set in CoA B25, Appendix 2 of the Infrastructure Approval and Section 7.6 of this BMP is recorded, report the non-compliance to the Department. Works can only recommence once the Environment and Sustainability Manager has confirmed that appropriate measures to limit the potential recurrence of the event, have been implemented.
All Project	Construction	N/A	Minimise and manage the impacts of the project on biodiversity.	Environment and Construction Manager All Project staff	N/A	Minimise the risk of injury and mortality of fauna.	Zero fauna injured as a result of procedures within this BMP not being adhered to	Fauna strike, injury or mortality register	Post-clearing Report Incident Report	Updated as required (based on fauna strike, injury or mortality)	Fauna injured due to procedures not being adhered to	Investigate the event and implement any corrective actions identified. Review if further Project training is required and implement if needed. Determine if an incident or non-compliance has occurred in accordance with Section 3.8 of the CEMP. Works can only recommence once the Environment and Sustainability Manager has confirmed that appropriate measures to limit the potential recurrence of the event, have been implemented.
All Project	Preconstruction Construction	N/A	Minimise and manage the impacts of the project on biodiversity.	Design Manager Environment and Sustainability Manager Construction Manager Supervisor Ecologist	Hollows impacted by Project works identified through pre-clearing surveys	Artificial hollow installation to commence as early as practicable prior to clearing activities in a particular location	Artificial hollow installation will commence prior to clearing in a particular location if practicable	Progress updates from the ecologists via meetings Artificial Hollow Installation Report	Artificial Hollow Installation Report Weekly Inspections	Iteratively through pre-construction and construction Report: Once, post artificial hollow installation	Artificial hollow installation does not occur at all prior to clearing commencement	Determine why artificial hollows cannot be installed and address barriers to installation where possible. Review construction methodology to ensure hollow installation aligns with broader program and proposed clearing works. Reinspect to confirm this has occurred. Determine if an incident or non-compliance has occurred in accordance with Section 3.8 of the CEMP Works can only recommence once the Environment and Sustainability Manager has confirmed that appropriate measures to limit the potential recurrence of the event, have been implemented

Project Location/ Work Area	Timing (Project Phase)	Feature	Objective	Responsibility	Baseline Data	Targets / Completion criteria	Performance indicators	Monitoring Method (how the performance indicator will be validated)	Record/Report	Frequency/ timing	Decision Trigger (measurable threshold)	Adaptive Action / Response
All Project	Construction	N/A	Minimise and manage the impacts of the project on biodiversity.	Design Manager Construction Manager Supervisor Environment and Sustainability Manager Ecologist	Exclusion Zones as identified through detailed design and construction	No clearing undertaken within Biodiversity Exclusion Zones.	No clearing of Biodiversity Exclusion Zones Compliance with the requirements per Appendix B: Vegetation Clearing Procedures	Inspections Pre-clearing surveys Clearing supervision	Weekly Inspections Pre-clearing Survey Reports Post-clearing Reports	Weekly (as part of the Weekly Environmental Inspections) Iteratively through pre-clearing and clearing works	Clearing or management of Biodiversity Exclusion Zones is not in accordance with Appendix B: Vegetation Clearing Procedures	Stop work immediately if construction activities occur that result in unauthorised disturbance. Investigate the event and implement any corrective actions identified. Review the construction methodology and management measures for exclusion zones and modify. Review if further Project training is required and implement if needed. Determine if an incident or non-compliance has occurred in accordance with Section 3.8 of the CEMP Works can only recommence once the Environment and Sustainability Manager has confirmed that appropriate measures to limit the potential recurrence of the event, have been implemented
Disturbance Footprint	Construction	N/A	Minimise and manage the impacts of the project on biodiversity.	Design Manager Construction Manager Environment and Sustainability Manager Ecologist	Revised BDAR Detailed Design	Impact assessment completed prior to blasting and/or crushing activities and provided to NSW DCCEEW Environment and Heritage	Impact assessment for blasting and/or crushing activities completed and provided to DCCEEW	Construction planning meetings Environmental Meetings	Meeting Minutes Construction Program	As required, prior to blasting and/or crushing activities	Blasting and/or crushing occurs prior to impact assessment completion	Stop work immediately if construction activities occur that result in unauthorised disturbance. Investigate the event and implement any corrective actions identified. Review if further Project training is required and implement if needed. Project ecologist to review works completed and undertake impact assessment for blasting and/or crushing activities to determine if any impacts to listed species have occurred. If impacts have occurred, the ecologist and Environment and Sustainability Manager to advise and consult with Transgrid and DCCEEW. Determine if an incident or non-compliance has occurred in accordance with Section 3.8 of the CEMP. Works can only recommence once the Environment and Sustainability Manager has confirmed that appropriate measures to limit the potential recurrence of the event, have been implemented.
Waterways in Disturbance Footprint	Preconstruction	N/A	Minimise and manage the impacts of the project on biodiversity.	Design Manager Environment and Sustainability Manager Construction Manager Supervisor Ecologist	CLASS 1 streams identified in the Revised BDAR (Niche) Detailed Design for additional CLASS 1 stream crossings	Surveys completed at CLASS 1 streams identified as supporting potential habitats for threatened species at the site of proposed new tracks or upgraded tracks prior to construction	Surveys completed prior to construction commencement at identified CLASS 1 streams.	Construction planning meetings Environmental Meetings	Pre-construction Aquatic Biodiversity Survey Report	Prior to construction at a Class 1 stream Report: Once, within three months of all surveys completed	Detailed Design identifies new tracks or upgraded tracks at CLASS 1 streams that have not had a pre-construction survey completed. Construction works for waterway crossings at identified CLASS 1 streams	Detailed design to be reviewed to determine alternate waterway crossing approaches. Additional surveys identified as required for waterway crossings to be undertaken by Project ecologist prior to construction commencement. Stop work immediately if construction activities occur that result in unauthorised disturbance. Project ecologist to review if any indirect or direct impacts have occurred to threatened species as a result of construction works. If impacts have occurred, ecologist and Environment and Sustainability Manager to

Project Location/ Work Area	Timing (Project Phase)	Feature	Objective	Responsibility	Baseline Data	Targets / Completion criteria	Performance indicators	Monitoring Method (how the performance indicator will be validated)	Record/Report	Frequency/timing	Decision Trigger (measurable threshold)	Adaptive Action / Response
											commenced without survey completion	advise and consult with Transgrid and DCCEEW. Construction methodology review to identify management measures and changes to procedures that will reduce re-occurrence of incidents. Review if further Project training is required and implement if needed. Investigate the event and implement any corrective actions identified. Determine if an incident or non-compliance has occurred in accordance with Section 3.8 of the CEMP. Works can only recommence once the Environment and Sustainability Manager has confirmed that appropriate measures to limit the potential recurrence of the event, have been implemented.
All Project	Construction	N/A	Minimise and manage the impacts of the project on biodiversity.	Detailed Design Manager Environment and Sustainability Manager Construction Manager Ecologist	Baseline data per Appendix H: Flora and Fauna Monitoring Program	No uncertain indirect or prescribed impacts are caused through Project works	No uncertain indirect or prescribed impacts are caused through Project works.	Biodiversity Monitoring detailed in Appendix H: Flora and Fauna Monitoring Program	Reporting per Appendix H: Flora and Fauna Monitoring Program	Frequency and timing per Appendix H: Flora and Fauna Monitoring Program	Uncertain indirect or prescribed impacts are identified and cannot be adaptively managed	Project ecologist to advise if uncertain indirect or prescribed impacts are identified through monitoring that cannot be adaptively managed. If impacts are identified, Project ecologist and Environment and Sustainability Manager to advise and consult with Transgrid. Review if additional credit obligations are required to be implemented. Review if conservation measures for impacted species are required to be implemented.
Rehabilitation												
Easement	Construction	Tower pads, laydowns and brake and winch sites	Rehabilitate and restore disturbance areas to their preexisting condition	Environment and Sustainability Manager Construction Manager Supervisor	Existing Land Use Revised BDAR Rehabilitation Baseline Monitoring Report	All temporary infrastructure is removed	Temporary infrastructure removed	Inspection	Inspection Records	Once following completion of construction and demobilisation from the area	Temporary infrastructure remains on-site	Determine why infrastructure cannot be removed and address barriers to removal. Reinspect until removed. If infrastructure must stay, then ensure that any relevant approvals that may be required are obtained and landowner agreement is in place
Easement	Construction	Tower pads, laydowns and brake and winch sites	Rehabilitate and restore disturbance areas to their preexisting condition	Environment and Sustainability Manager Construction Manager Supervisor	Existing Land Use Revised BDAR Rehabilitation Baseline Monitoring Report	Topsoil reinstated	Topsoil has been reinstated in the previously disturbed areas	Inspection	Inspection Records	Once following completion of construction and demobilisation from the area	Topsoil not reinstated	Topsoil to be reinstated. Reinspect to confirm this has occurred
Easement	Construction	Tower pads, laydowns and brake and winch sites	Rehabilitate and restore disturbance areas to their preexisting condition	Environment and Sustainability Manager Construction Manager Supervisor	Existing Land Use Revised BDAR Rehabilitation Baseline	Disturbed surfaces are adequately prepared, as per the Blue Book, to encourage and facilitate natural regeneration	Disturbed surfaces are confirmed as stable and non-polluting (CPESC to confirm)	Progressive photos of select areas. Assessment to determine if area is stable and non-polluting (may	ESCPs ESC Inspection Records Soil Conservationist Sign-off	Monthly until confirmation is received that the area is stable and non-polluting	Area confirmed to be unstable and requires further measures	Seek advice from the Soil Conservationist Implement additional measures (as may be deemed necessary based on location and site aspects) Reinspect until the location is deemed to be stable

Project Location/ Work Area	Timing (Project Phase)	Feature	Objective	Responsibility	Baseline Data	Targets / Completion criteria	Performance indicators	Monitoring Method (how the performance indicator will be validated)	Record/Report	Frequency/timing	Decision Trigger (measurable threshold)	Adaptive Action / Response
					Monitoring Report			be undertaken by CPESC)				
Easement	Construction	Tower pads, laydowns and brake and winch sites	Rehabilitate and restore disturbance areas to their preexisting condition	Environment and Sustainability Manager Construction Manager Supervisor	Existing Land Use Revised BDAR Rehabilitation Baseline Monitoring Report	All rubbish and waste materials are removed	No visible rubbish or waste	Inspection	Inspection Records	Once following completion of construction and demobilisation from the area	Waste remains on site	Waste to be removed. Reinspect to confirm this has occurred
Easement	Construction	Access tracks and access points	Rehabilitate and restore disturbance areas to their preexisting condition	Environment and Sustainability Manager Construction Manager Supervisor	Existing Land Use Revised BDAR Rehabilitation Baseline Monitoring Report	Operational requirements for access and consultation with landowner confirm final land use	Trans grid and/or landowner confirmation of final land use of the access track/point	Written confirmation or record of conversation confirming consultation with landowner on final land use	Written confirmation Record Record of conversation	Prior to commencement of decommissioning or rehabilitation works	Final land use of the access track/point is not in accordance with landowner consultation outcomes	Determine why this has occurred. Liaise again with landowner. Determine if additional rectification works are required
Easement	Construction	Access tracks and access points	Rehabilitate and restore disturbance areas to their preexisting condition	Environment and Sustainability Manager Construction Manager Supervisor	Existing Land Use Revised BDAR Rehabilitation Baseline Monitoring Report	Where access track/point is restored, all infrastructure required to be removed has been removed	Where access track/point is restored, infrastructure is removed	Inspection	Inspection Records	Once following completion of construction and demobilisation from the area	Infrastructure remains on site for an access track/point that needs to be restored	Determine why infrastructure cannot be removed and address barriers to removal. Reinspect until removed. If infrastructure must stay, then ensure that any relevant approvals that may be required are obtained and landowner agreement is in place
Easement	Construction	Access tracks and access points	Rehabilitate and restore disturbance areas to their preexisting condition	Environment and Sustainability Manager Construction Manager Supervisor	Existing Land Use Revised BDAR Rehabilitation Baseline Monitoring Report	Where access track/point is restored, topsoil is reinstated	Where access track/point is restored, topsoil has been reinstated	Inspection	Inspection Records	Once following completion of construction and demobilisation from the area	Topsoil not reinstated for an access track/point that needs to be restored	Topsoil to be reinstated. Reinspect to confirm this has occurred
Easement	Construction	Ancillary facilities	Safe, stable and non-polluting	Environment and Sustainability Manager Construction Manager Supervisor	Existing Land Use Revised BDAR Rehabilitation Baseline Monitoring Report	Progressive erosion and sediment control Plan prepared and implemented	Erosion controls have been implemented. No further sediment controls are required as appropriate cover has been achieved	Inspection	Inspection Records	Weekly (as part of the Weekly Environmental Inspections when the area is inspected)	Controls not installed in accordance with the PESCPs	Controls to be installed. Site to be reinspected
Easement	Construction	Ancillary facilities	Safe, stable and non-polluting	Environment and Sustainability Manager Construction Manager Supervisor	Existing Land Use Revised BDAR Rehabilitation Baseline Monitoring Report	Topsoil reinstated	Topsoil has been reinstated in the previously disturbed areas	Inspection	Inspection Records	Once following completion of construction and demobilisation from the area	Topsoil not reinstated	Topsoil to be reinstated. Reinspect to confirm this has occurred

Project Location/ Work Area	Timing (Project Phase)	Feature	Objective	Responsibility	Baseline Data	Targets / Completion criteria	Performance indicators	Monitoring Method (how the performance indicator will be validated)	Record/Report	Frequency/timing	Decision Trigger (measurable threshold)	Adaptive Action / Response
Easement	Construction	Ancillary facilities	Safe, stable and non-polluting	Environment and Sustainability Manager Construction Manager Supervisor	Existing Land Use Revised BDAR Rehabilitation Baseline Monitoring Report	Disturbed surfaces are adequately prepared, as per the Blue Book, to encourage and facilitate natural regeneration	Disturbed surfaces are confirmed as stable and non-polluting (CPESC to confirm)	Progressive photos of select areas. Assessment to determine if area is stable and non-polluting (may be undertaken by CPESC)	ESCPs ESC Inspection Records Soil Conservationist Sign-off	Monthly until confirmation is received that the area is stable and non-polluting	Area confirmed to be unstable and requires further measures	Seek advice from the Soil Conservationist Implement additional measures (as may be deemed necessary based on location and site aspects) Reinspect until location is deemed to be stable
Easement	Construction	Ancillary facilities	Safe, stable and non-polluting	Environment and Sustainability Manager Construction Manager Supervisor	Existing Land Use Revised BDAR Rehabilitation Baseline Monitoring Report	No significant erosion is present that would compromise the establishment of vegetation	Controls that relate to rehabilitation are implemented in accordance with the Progressive Erosion and Sediment Control Plans (PESCPs)	Inspection	Inspection Records	Weekly (as part of the Weekly Environmental Inspections)	Controls not installed in accordance with the PESCPs	Controls to be installed. Site to be reinspected
Easement	Construction	Ancillary facilities	Progressively rehabilitate the site as soon as possible following disturbance	Environment and Sustainability Manager Construction Manager Supervisor	Existing Land Use Revised BDAR Rehabilitation Baseline Monitoring Report	Commence decommissioning and/or rehabilitation within 1-2 months of completion of use of the site unless the Planning Secretary agrees otherwise.	Controls that relate to rehabilitation are implemented in accordance with the PESCPs.	Inspection	Inspection Records	Weekly (as part of the Weekly Environmental Inspections)	Controls not installed in accordance with the PESCPs	Controls to be installed. Site to be reinspected
Easement	Construction	Ancillary facilities	Progressively rehabilitate the site as soon as possible following disturbance	Environment and Sustainability Manager Construction Manager Supervisor	Existing Land Use Revised BDAR Rehabilitation Baseline Monitoring Report	Topsoil reinstated	Topsoil has been reinstated in the previously disturbed areas	Inspection	Inspection Records	Once following completion of construction and demobilisation from the area	Topsoil not reinstated	Topsoil to be reinstated. Reinspect to confirm this has occurred
Easement	Construction	Ancillary facilities	Progressively rehabilitate the site as soon as possible following disturbance	Environment and Sustainability Manager Construction Manager Supervisor	Existing Land Use Revised BDAR Rehabilitation Baseline Monitoring Report	Disturbed surfaces are adequately prepared, as per the Blue Book, to encourage and facilitate natural regeneration	Disturbed surfaces are confirmed as stable and non-polluting (CPESC to confirm)	Progressive photos of select areas. Assessment to determine if area is stable and non-polluting (may be undertaken by CPESC)	ESCPs ESC Inspection Records Soil Conservationist Sign-off	Monthly until confirmation is received that the area is stable and non-polluting	Area confirmed to be unstable and requires further measures	Seek advice from the Soil Conservationist Implement additional measures (as may be deemed necessary based on location and site aspects) Reinspect until location is deemed to be stable
Easement	Construction	Ancillary facilities	To be decommissioned and removed unless the Planning Secretary	Environment and Sustainability Manager Construction Manager	Existing Land Use Revised BDAR Rehabilitation Baseline	Redundant services including power are disconnected	Services are no longer connected	Inspection	Inspection Records	Once following completion of construction and demobilisation from the area	Redundant services remain connected	Determine why service needs to be connected (if it does) If connection is not required, ensure that disconnection occurs. Reinspect to confirm disconnection.

Project Location/ Work Area	Timing (Project Phase)	Feature	Objective	Responsibility	Baseline Data	Targets / Completion criteria	Performance indicators	Monitoring Method (how the performance indicator will be validated)	Record/Report	Frequency/ timing	Decision Trigger (measurable threshold)	Adaptive Action / Response
			agrees otherwise.	Supervisor	Monitoring Report							
Easement	Construction	Ancillary facilities	To be decommissioned and removed unless the Planning Secretary agrees otherwise.	Environment and Sustainability Manager Construction Manager Supervisor	Existing Land Use Revised BDAR Rehabilitation Baseline Monitoring Report	All temporary infrastructure required to be removed is removed including accommodation facilities and temporary buildings	Temporary infrastructure removed • Agreement is to be obtained from the Planning Secretary if removal is not proposed	Inspection	Inspection Records	Once following completion of construction and demobilisation from the area	Temporary infrastructure remains on-site	Determine why infrastructure cannot be removed and address barriers to removal. Reinspect until removed. If infrastructure must stay, then ensure that approval of the Planning Secretary is obtained, and landowner agreement is in place
Easement	Construction	Ancillary facilities	To be decommissioned and removed unless the Planning Secretary agrees otherwise.	Environment and Sustainability Manager Construction Manager Supervisor	Existing Land Use Revised BDAR Rehabilitation Baseline Monitoring Report	Temporary construction fencing removed	Temporary construction fencing removed	Inspection	Inspection Records	Once following completion of construction and demobilisation from the area	Temporary construction fencing remains on-site	Determine why fencing cannot be removed and address barriers to removal. Reinspect until removed. If fencing must stay, then ensure that approval of the Planning Secretary is obtained as required and landowner agreement is in place
Easement	Construction	Ancillary facilities	To be decommissioned and removed unless the Planning Secretary agrees otherwise.	Environment and Sustainability Manager Construction Manager Supervisor	Existing Land Use Revised BDAR Rehabilitation Baseline Monitoring Report	For access tracks/ points, operational requirements for access, and consultation with landowner to confirm final land use	Transgrid and/or landowner confirmation of final land use of the access track/point	Written confirmation or record of conversation confirming consultation with landowner on final land use	Written confirmation Record Record of conversation	Prior to commencement of decommissioning or rehabilitation works	Final land use of the access track/point is not in accordance with landowner consultation outcomes	Determine why this has occurred. Liaise again with landowner. Determine if additional rectification works are required
Easement	Construction	Land use	Restore land capability to preexisting use	Environment and Sustainability Manager Construction Manager Supervisor	v	Final land use agreed with landowner	Landowner confirmation of final land use of the access track/point	Written confirmation or record of conversation confirming final land use	Written confirmation Record Record of conversation	Prior to commencement of decommissioning or rehabilitation works	Final land use is not in accordance with landowner agreement	Determine why this has occurred. Liaise again with landowner. Determine if additional rectification works are required
Easement	Construction	Community	Ensure public safety at all times	Environment and Sustainability Manager Construction Manager Supervisor	Existing Land Use Revised BDAR Rehabilitation Baseline Monitoring Report	All temporary infrastructure required to be removed is removed	Temporary infrastructure removed. Agreement is to be obtained from the Planning Secretary if removal is not proposed	Inspection	Inspection Records	Once following completion of construction and demobilisation from the area	Temporary infrastructure remains on-site	Determine why infrastructure cannot be removed and address barriers to removal. Reinspect until removed. If infrastructure must stay, then ensure that approval of the Planning Secretary is obtained as required and landowner agreement is in place
Easement	Construction	Community	Ensure public safety at all times	Environment and Sustainability Manager Construction Manager Supervisor	Existing Land Use Revised BDAR Rehabilitation Baseline Monitoring Report	Implementation of safety requirements during all decommissioning and rehabilitation works	Public access to the site is not provided until it is considered safe to do so	Inspections by Project safety staff	Inspection Records	Safety inspections to occur per Project safety requirements	Inspection deems that the site is not safe during decommissioning and rehabilitation works	Controls to be implemented as identified by Project safety staff. Reinspection to occur to determine controls have been implemented

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APPENDIX A: UNEXPECTED SPECIES FINDS PROTOCOL

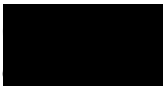
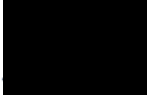
HumeLink East



Unexpected Threatened Species Finds Procedure

HLE-AGJ-ENV-ALE-PRD-0000-00004 | Rev 02

I. APPROVALS

	Name	Signature	Date
Author:			21/07/2025
Sponsor:			21/07/2025
Project Director:			21/07/2025

The authorised use of this document shall only be once approved by way of presence of signatories under section above.

II. DOCUMENT CONTROL – REVISION HISTORY

Rev	Date	Pages	Revised by	Description
A	16/01/2024	All		For submission to Transgrid
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C	15/07/2024	All		Updated for Amendment Report and Revised BDAR. For submission to Transgrid
D	14/08/2024	All		Update to address Transgrid comments
00	19/08/2024	Nil		IFU
01.1	29/11/2024	All		 BCS Comments
01.2	14/04/2025	All		Updated to address BCS and ER comments.
01.3	6/06/2025	1		Updated to address CPHR comments.
01.4	21/07/2025	4 and 5		Updated to address CPHR comments
02	15/09/2025	Nil		Issued for Use

GENERAL REQUIREMENTS

The Project Director is responsible for the distribution of this Management Plan. The controlled master version of this document is available for distribution as appropriate and maintained on RIB | CX. All circulated hard copies of this document are deemed to be uncontrolled. The implementation of this Management Plan is under the authority of AGJV and the Project Director. All personnel employed on the Project will perform their duties in accordance with the requirements of this Management Plan, supporting management plans, and related procedures.

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1. INTRODUCTION

This Unexpected Threatened Species Finds Procedure (Procedure) is an appendix to the Biodiversity Management Sub-plan (BMP) which forms part of the Construction Environmental Management Plan (CEMP) for the HumeLink East Project (the Project). Acciona Genus Joint Venture (AG JV) has been contracted to deliver the Project. Refer to the BMP for the glossary, references & compliance against relevant Conditions of Approval (CoA) and Updated Mitigation Measures (UMMs).

1.1 PURPOSE

This Procedure details the actions to be taken in the event that an unexpected actual or potential threatened species, population or threatened ecological community is encountered during Project works in accordance with UMM B3 and CoA B30. An unexpected find is a species/entity that has not been assessed in the Biodiversity Development Assessment Report (BDAR) or has been assessed but is found outside the known range in the BDAR.

This Procedure has been prepared by Principal Ecologist [REDACTED] (Zoology & Entomology), Hons (Zoology), PhD (Ecology) and [REDACTED] (Biology), Grad. Dip. (Bushfire Protection).

1.2 SCOPE

This Procedure applies to the following:

- All activities conducted by site personnel (including sub-contractors) that have the potential to encounter unexpected threatened species finds (usually during pre-clearing inspections and construction)
- Where the Project does not have approval to impact the threatened species
- Where a species is detected outside the range surveyed in the BDAR, and
- Where mitigation measures for managing the disturbance (apart from this procedure) are not contained in the BDAR.

1.3 INDUCTION AND TRAINING

All Project personnel are to be inducted on the existence of this Procedure during the Project Induction and in more detail as required in Site Inductions and regular Toolbox Talks. Records of all training, including inductions, will be maintained. Records will include the name and role of the attendee, the date of training/induction as well as the name of the course.

1.4 ROLES AND RESPONSIBILITIES

The Project Team's organisational structure and overall roles and responsibilities are outlined in Section 3.5 of the CEMP. Specific responsibilities for the implementation of environmental controls are detailed in Table 33 of the BMP.

The Acciona Genus Joint Venture (AGJV) Environment and Sustainability Manager (or delegate) will be notified in the event of a potentially unexpected find on-site during the works. The AGJV Environment and Sustainability Manager will then notify the Transgrid Senior Environmental Business Partner (SEBP) of the potential unexpected find. The AGJV Environment and Sustainability Manager will organise for the Project Ecologist to assess the find. The AGJV Environment and Sustainability Manager is the key contact point for the Transgrid SEBP regarding this Procedure.

The Project Ecologist will advise on the nature of any find, including whether it should be considered "unexpected" in terms of the Planning Approval, whether the species is listed as a threatened species or forms part of a TEC, the "no-go" zone for any nearby works, any controls that should be put in place to manage the find and the likely impact to the threatened species or TEC from the proposed work. The Project Ecologist will develop any required management plan (or equivalent) for the management of any unexpected find. The Project Ecologist will report to the AGJV Environment and Sustainability Manager.

The SEBP will liaise with relevant government agencies in the event that an impact on a threatened species or TEC has occurred or is likely to occur. Transgrid will be responsible for any further assessment in relation to offsetting residual impacts to unexpected finds.

All site personnel are responsible for reporting any unexpected finds for the duration of the Project.

1.5 PERMITS AND LICENCES

A Scientific Licence under Part 2 of the BC Act (including Animal Ethics Approval under the Animal Research Act 1985) is required for fauna handling/rescue and survey work. Where rescued fauna requires rehabilitation and care, only wildlife rehabilitation organisations authorised under Part 2 of the BC Act may be used.

1.6 REVIEW

This Procedure will be reviewed annually or earlier as needed in response to an unexpected find, audit finding, incident or near miss. Where changes to the procedure are required, the procedure will be updated in accordance with Section 3.11 of the CEMP. Project reporting requirements and responsibilities are documented in Section 3.9.6 of the CEMP.

2. PROCEDURE

In the event an unexpected find is encountered during site works, the following procedure (Figure 1) must be followed with detailed actions relating to each step included below.

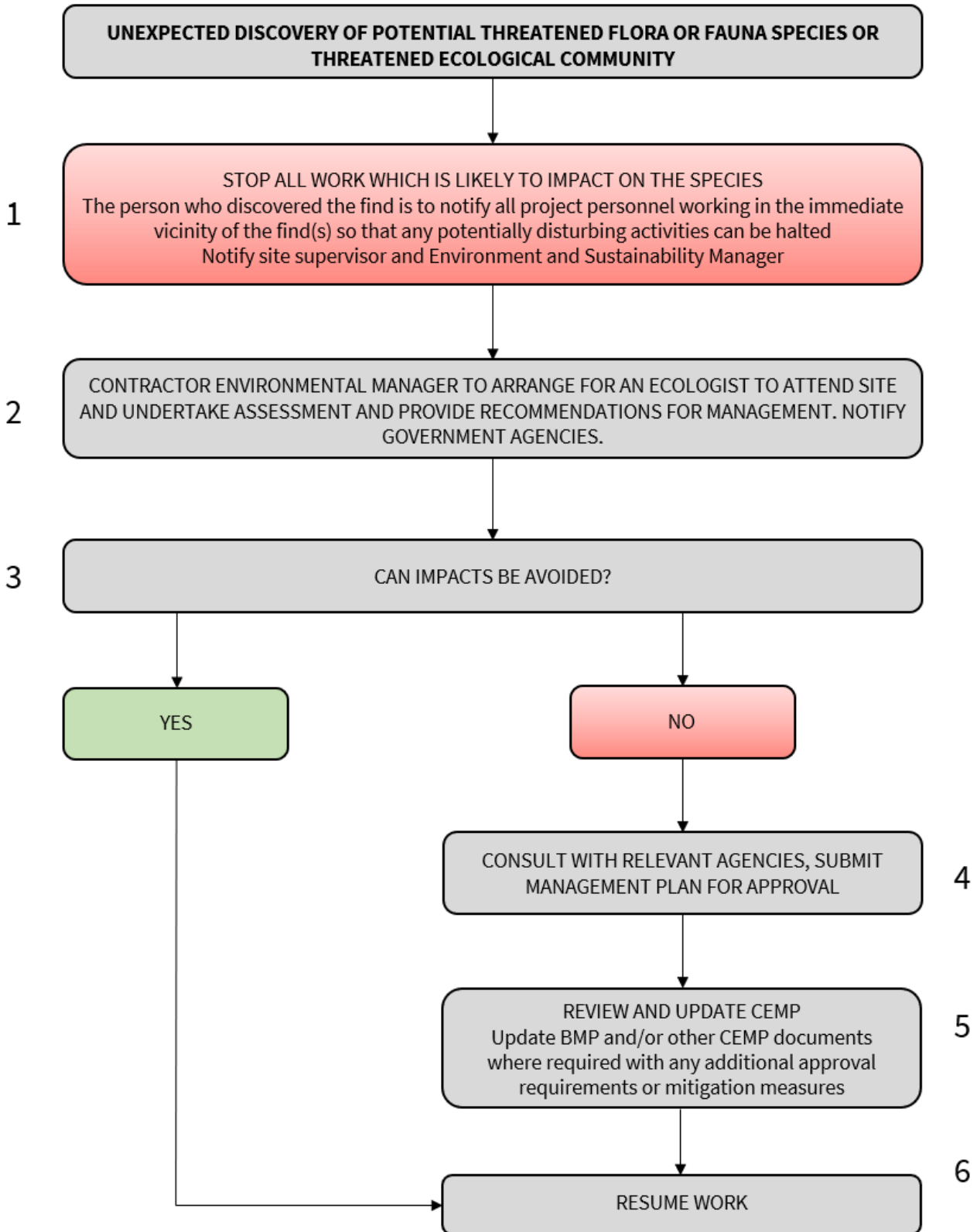


Figure 1. Unexpected Threatened Species and Threatened Ecological Community Finds Procedure.

Step 1. Stop all work which is likely to impact on the threatened species or ecological community

If an unexpected threatened species, SAIL or TEC is encountered during construction activities:

1. Immediately after the encounter, stop all work in the immediate associated area of the find and notify the AGJV Environment and Sustainability Manager, AGJV Project Manager and Site Supervisor. The AGJV Environment and Sustainability Manager (or delegate) will notify the SEBP.
2. The AGJV Project Manager or Site Supervisor will be responsible for establishing a 'no-go zone' around the find as soon as practical. The no-go zone will be established using high-visibility fencing and signage, where practicable. The location of the 'no-go zone', and any other necessary controls, will be confirmed with the Project Ecologist.
3. The AGJV Environment and Sustainability Manager will report the Unexpected Find to Transgrid as a 'report-only' in accordance with the Environmental Incident Procedure in accordance with Section 3.9.6 of the CEMP.

Step 2. AGJV Environment and Sustainability Manager to arrange for an ecologist to attend the site and undertake assessment and provide recommendations for management. Notify government agencies.

The Project Ecologist or AGJV Environmental Personnel (EP) will survey the find and confirm whether the find constitutes an unexpected threatened species, SAIL or TEC and has not been assessed in the BDAR.

If it is determined that the find is **not unexpected**, works in the vicinity of the species/community must only recommence once it is confirmed that the identified measures from the approval, permit or appropriate safeguard are in place. After having done so, no further action will be required.

If an **unexpected find is confirmed**, continue with this process.

The Project Ecologist will assess if there have been any impacts on the find from the Project Works to date and provide recommendations to be implemented until approvals can be sought.

If the threatened species or TEC has been impacted an environmental incident report will be raised in accordance with the Environmental Incident Procedure.

The NSW DCCEEW and other relevant government agencies will be notified informally by telephone or email by the SEBP as soon as the ecologist confirms the find is unexpected.

Other relevant agencies for notification may include DPI Fisheries and Commonwealth DCCEEW.

The Project Ecologist or AGJV EP will assess the potential impacts of Project Works on the find and develop a draft management plan.

The management plan will implement the following principles in order of the below hierarchy:

1. Avoid impacts to the threatened species or TEC – this may include design changes, work practice changes or timing of works where possible
2. Minimise impacts – in circumstances where minor impacts cannot be avoided, the Project Ecologist/ AGJV must still make efforts to reduce any impacts as far as reasonably possible. This includes design changes, changes to work practices, timing of works or relocating a find (where appropriate and possible). Offsetting may still be required for minimised impacts.
3. Offset – in circumstances where impacts cannot be avoided the impacts to the find are to be offset as appropriate to the type of find

The management plan will be prepared with consideration to the relevant CEMP sub-plans, revised environmental mitigation measures, Minister's CoA and assessment documentation.

The Project Ecologist will submit this plan to the AGJV Project Manager and Environment and Sustainability Manager outlining all relevant issues and constraints.

The AGJV Project Manager and Environment and Sustainability Manager will review the management plan. The Plan will be submitted to Transgrid for review and approval.

Step 3. Can impacts be avoided?

If the impacts to threatened species, SAIL or TEC can be avoided, then work may resume.

If the impacts cannot be avoided, move to step 4.

Step 4. Consult with relevant agencies and submit management plan for approval.

If required, a formal notification letter will be prepared by AGJV and the Project Ecologist.

The draft notification letter will then be sent to the SEBP for review.

The signed notification letter and management plan will be submitted to relevant government agencies by Transgrid.

The SEBP will notify and consult with relevant government agencies including the Planning Secretary and CPHR (and AG DCCEEW where relevant) on the proposed management of the unexpected find if required. This includes an agreement to determine avoidance measures in consultation with CPHR for any SAIL entities that are found unexpectedly. This could include the opportunity for a site inspection.

Any comments received by relevant government agencies will be considered and where required, the management plan will be modified. Transgrid will submit the plan to DPHI to inform DPHI endorsement for recommencement of work in accordance with CoA B30(d)(iv).

Step 5. Review CEMP and this procedure

The CEMP will be reviewed and updated as appropriate with any changes resulting from the find and final Threatened Species / TEC management plan.

The updated CEMP will incorporate additional recommendations arising from consultation. If a major update to the CEMP is required, approval will be sought from the ER or DPHI, in consultation with relevant government agencies. This procedure will be updated if required.

The Threatened Species/ TEC management plan and updated CEMP will be implemented. This includes adding any changes to the CEMP in site induction material. Project ECMs and GIS will be updated to include all confirmed unexpected finds. Site workers will be briefed on the changes during toolbox talks.

Step 6. Resume work.

Work in the associated location is not to recommence until approval has been issued by BCS or DPHI and the Planning Secretary has endorsed the recommencement of work.

The AGJV Project Manager will seek written clearance to resume Project work from the Transgrid Project Director or delegate in consultation with the ecologist and relevant government agencies.

Work will resume with any Threatened Species / TEC Management Plan and updated CEMP and sub-plans implemented if appropriate.

APPENDIX B: VEGETATION CLEARING PROCEDURES

HumeLink East



Vegetation Clearing Procedure

HLE-AGJ-ENV-ALE-PRD-0000-00005 | Rev 02

I. APPROVALS

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Author:	[REDACTED] [REDACTED] [REDACTED]	[REDACTED]	03/09/2025
Sponsor:	[REDACTED]	[REDACTED]	03/09/2025
Project Director:	[REDACTED]	[REDACTED]	03/09/2025

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II. DOCUMENT CONTROL – REVISION HISTORY

Rev	Date	Pages	Revised by	Description
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B	3/04/2024	All	[REDACTED] [REDACTED]	For submission to Transgrid
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D	14/08/2024	All	[REDACTED] [REDACTED]	Update to address Transgrid comments
00	19/08/2024	Various	[REDACTED] [REDACTED]	Minor edits to address further Transgrid comments. IFU.
01.1	29/11/2024	All	[REDACTED] [REDACTED]	[REDACTED] BCS Comments
01.2	14/04/2025	All	[REDACTED] [REDACTED]	Updated to address BCS and ER comments.
01.3	02/05/2025	Various	[REDACTED]	Update to address ER Comments
01.4	24/06/2025	Various	[REDACTED] [REDACTED] [REDACTED]	Updated to address CPHR comments.
01.5	28/07/2025	Various	[REDACTED]	Updated to address CPHR comments
01.6	13/08/2025	Various	[REDACTED]	Updated to address CPHR comments
01.7	03/09/2025	Table 4	[REDACTED]	Updated to Address DPHI Comments
02	15/09/2025	Nil		Issued for Use

GENERAL REQUIREMENTS

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1. INTRODUCTION

This Vegetation Clearing Procedure (Procedure) is an appendix to the Biodiversity Management Plan (BMP) and forms part of the overall environmental management framework for the HumeLink East project (the Project). Acciona Genus Joint Venture (AG JV) has been contracted to deliver the Project. Refer to the Biodiversity Management Plan (BMP) for the glossary, references & compliance against relevant Conditions of Approval (CoA) and Updated Mitigation Measures (UMMs).

1.1 PURPOSE

This Procedure describes how AG JV proposes to manage clearing during the construction of the HumeLink East works to minimise impacts on biodiversity in accordance with UMM B3 and UMM B20 and CoA B30.

This Procedure has been prepared by Principal Ecologist Alex Graham BSc (Biology), Grad. Dip. (Bushfire Protection) and Dr Jack Tatler BSc (Zoology & Entomology), Hons (Zoology), PhD (Ecology).

1.2 SCOPE

This Procedure applies to the pre-clearing and clearing activities conducted by site personnel, including sub-contractors, for the Project. This includes, but is not limited to, clearing and grubbing within the following 'disturbance zones':

- Total clearance zone (TCZ) where all vegetation/ habitat would be removed
- Easement clearance zone (ECZ) which would be subject to partial loss of vegetation associated with clearing taller vegetation within sections of the easement
- Hazard tree zone (HTZ) which would be subject to partial loss of vegetation associated with the removal of hazardous trees only.

All monitoring and associated reporting required for this Strategy will be undertaken in accordance with Appendix H Flora and Fauna Monitoring Program.

1.3 INDUCTION AND TRAINING

All Project personnel are to be inducted on the existence of this Procedure during the Project Induction and in more detail as required in Site Inductions, Toolbox Talks, daily prestart briefings, or targeted training as required. Records of all training, including inductions, will be maintained. Records will include the name and role of the attendee as well as the name of the course.

In addition, all relevant Project personnel involved in vegetation clearance, including relevant sub-contractors, will be trained on biodiversity management protocols and the requirements for the Project, provided with environmental control maps (showing clearing boundaries and exclusion zones) and updates as required and will be subject to toolbox talks and daily prestart meetings which will discuss items such as:

- The proposed clearing for the day
- The limits of clearing including retention of vegetation where required (e.g. shrubs and ground covers in partial clearance areas)
- Processes to follow
- Known or potentially occurring threatened species
- Exclusion zones.

1.4 ROLES AND RESPONSIBILITIES

The Project Team's organisational structure and overall roles and responsibilities are outlined in Section 3.5 of the CEMP. Specific responsibilities for the implementation of environmental controls are detailed in Table 33 of the BMP.

1.5 PERMITS AND LICENCES

A Scientific Licence under Part 2 of the BC Act (including Animal Ethics Approval under the Animal Research Act 1985) is required for fauna handling/rescue and survey work. Where rescued fauna

requires rehabilitation and care, only wildlife rehabilitation organisations authorised under Part 2 of the BC Act may be used.

All requirements for the EPBC Act relating to this procedure are detailed in Section 3.2 of the BMP

The Project Team's organisational structure and overall roles and responsibilities are outlined in Section 3.5 of the CEMP. Specific responsibilities for the implementation of environmental controls are detailed in Section 8 of the BMP.

1.6 RELEVANT DOCUMENTS, GUIDELINES AND SPECIFICATIONS

This procedure has been developed with consideration to the HumeLink Vegetation Clearing Method and Management Memorandum (Nov 2023).

2. VEGETATION CLEARING ZONES

Impacts on matters of biodiversity conservation significance will be avoided to the greatest extent practicable during the finalisation of the design and construction methodology for the Project. Additional avoidance and minimisation measures to further reduce impacts to entities that are likely to have a serious and irreversible impact (SAIL) to the greatest extent practicable must be identified.

Biodiversity constraints mapping will be used to guide the prioritisation of areas of high biodiversity conservation significance (particularly SAILs), and critically endangered ecological communities (CEECs) to avoid, where practicable. Spatial data, threatened species locations and constraints mapping will be provided to the design and construction teams and considered in detailed design. Associated mapping will be included in Environmental Control Maps (ECMs) and provided to the construction workforce.

Micro-siting of the transmission line infrastructure and associated work sites will occur to avoid or minimise impacts wherever practicable. Micro-siting will focus on transmission towers and access tracks, and will be undertaken as part of the detailed design stage of the Project, to:

- Minimise prescribed impacts as described in the revised BDAR (i.e. avoiding impact to rocky habitats or caves and waterways)
- Minimise impacts to native vegetation where possible including cut and fill
- Avoid impacts to groundwater dependent ecosystems (GDEs), aquatic habitats and supporting aquifers.
- Reduce the vegetation clearing extents for the project to avoid carbon sink lost, hence reducing the Project's Greenhouse Gas (GHG) emissions.

Site features with the highest biodiversity conservation significance, in particular recorded threatened species, and their habitat, will be given the highest priority for impact avoidance.

Intact and/ or higher condition remnants should be prioritised for avoidance, incorporating consideration of connectivity between retained remnants within and adjacent to the Project footprint, and must be considered in the connectivity strategy.

2.1 DISTURBANCE AREAS

The vegetation clearing methodology is dependent on the type of disturbance area in which it is being undertaken. The key disturbance areas are as follows:

- Total clearance zone (TCZ) where all vegetation/ habitat would be removed
- Easement clearance zone (ECZ) which would be subject to partial loss of vegetation associated with clearing taller vegetation within sections of the easement
- Hazard tree zone (HTZ) which would be subject to a partial loss of vegetation associated with the removal of hazardous trees only.

Indicative disturbance zones are presented in Figure 1 and Figure 5.

2.1.1 TOTAL CLEARANCE ZONE

TCZ lands are subject to total clearing and ground disturbance (including earthworks). Permanent structures including transmission line structures, access tracks and substations would be situated within these lands as well as temporary brake and winch sites, temporary construction compounds and worker accommodation facilities.

Where possible, existing access tracks and clearings will be used to limit the construction of new tracks.

Access Track widths will be minimised where feasible to 4-6 meters with some locations requiring a 1-meter buffer on either side for the cut and/or fill. The project is also seeking to implement a micropile design for tower structures which requires smaller piling rigs and less concrete, which will enable reduced track design widths and increased grades. This design approach will decrease the project's cut and fill requirements and therefore the total TCZ required. This width is a significant reduction from the EIS allowances of 10-20m.

Tower Pad design and construction have also been optimised on hill slopes as below:

- Tiered construction benches to limit the overall cut/fill.
- Micropile design allows for reduced pad sizes from 50mx70m to 50x50m in non-tension tower locations.
- Combining crane and elevated works platform (EWP) pads to reduce tower pad size.
- Increasing crane pad grades to max 5% to avoid unnecessary cut
- Increasing assembly area grades to max 10% to avoid unnecessary cut
- Towers will also be designed with leg extensions to reduce batter lengths.

These approaches will reduce total clearing required for tower erection.

The TCZ will require the complete removal of vegetation to facilitate safe access of construction vehicles, plant and equipment and erection of transmission line structures. Clearing would be undertaken with the use of machinery, or manually where it is unsafe to operate machinery or access is limited. Root balls will be removed at foundation locations and potentially in other earthworks areas. However, root balls would be retained where practicable within the transmission line structure zone to minimise potential environmental and heritage impacts.

In areas subject to civil work (such as construction benches, structure footings, access track surfaces, and substation benches), complete removal of the root balls would be required. As such, a tree pusher would typically be used in these areas. Removed trees would be passed through a tub grinder with the material and then re-used for erosion and sediment control and stabilisation of disturbed areas during construction and in post-construction rehabilitation. Mulched material would only be stored within the cleared footprint.

In the areas where civil work is not required, a forest harvester or excavator-mulcher would be used. Rootballs would be retained where required due to environmental and heritage constraints. Mulched material will be evenly spread to a depth <50mm on bare, disturbed or exposed areas within the full clearing area to assist in the protection of the soil and to prevent suppression of germination and regeneration of native flora from the soil seed bank. Where low-growing vegetation, grasses or ground cover exists, care will be taken to avoid excess debris build-up/ smothering to promote regeneration of the grass layer.

Vegetation debris would be managed in accordance with Transgrid's *Transmission Line Construction Manual – Major New Build 2020* which stipulates relocating suitable fauna habitat to adjacent woodland where available/feasible and offering useful timber to landowners for reuse.

2.1.2 EASEMENT CLEARANCE ZONE

ECZ will be subject to partial clearing. It includes land within the proposed transmission line easement where clearing and ongoing suppression of tall growing vegetation would be undertaken, but ground-storey vegetation will be retained and allowed to re-establish. Tall growing vegetation includes any vegetation that may intrude on the Vegetation Clearance Requirements (VCR) at Maximum Line Operating Conditions (maximum conductor sag and blowout) at that location now or at any time in the future (see Figure 5). Vegetation clearance heights are set by Transgrid for operational and safety requirements, including bushfire risk management. A qualified arborist would assess tall growing vegetation. All tall growing vegetation (i.e. trees and tall shrubs) will be removed. While the EIS takes the precautionary approach of assuming full impacts to the shrub and canopy strata in the ECZ, in practice, much of the shrub vegetation in the ECZ will be retained (see Figure 5). The EIS approach utilises LiDAR to assess all tall growing trees for removal. This includes all trees that either sit within the VCR or have the potential to grow to encroach on this zone. Due to the lower quality of LiDAR data, this could include mid-story trees that sit below the top canopy and hence will be removed unnecessarily. Using an arborist to confirm the LiDAR approach, the ECZ required can be reduced significantly.

In areas safely accessible to machinery, smaller trees (or other tall growing vegetation) <200mm diameter at breast height (DBH) would be removed using an excavator-mulcher.

Vegetation >200mm DBH would be removed using a forest harvester, noting that tree branches/ canopy may be mulched *in situ*. Tree barrels would either be:

- Tub ground to provide material for erosion/sediment control and rehabilitation for use outside of the ECZ
- Re-used by landowners (pending negotiations)

- Mulched and evenly spread on bare disturbed areas to assist with the protection of the soil. Mulch will be spread to a depth of no greater than 50 millimetres wherever possible. Mulch will not be spread over areas with retained native understory.
- Relocated to the edge of the easement or retained on-easement as habitat in select areas (i.e. connectivity corridors and riparian lands) and where they will not impede easement access for maintenance.

Incidental impacts to native vegetation caused by machinery movements to tall-growing vegetation will be minimised by (but not limited to):

- Use of machinery that maximises vegetation clearance coverage/reach
- Use of machinery and tracks that minimise ground impacts
- Hand felling, where not safely accessible
- Consolidating/minimising machinery access paths
- Restriction of machinery access within ecologically sensitive areas (e.g. wetlands and bogs)
- Use of non-lethal methods of temporary vegetation removal (e.g. mulching/slashing, cutting), that would allow native vegetation to re-grow
- Use of targeted methods of lethal vegetation control to avoid damage/death of non-target individuals (e.g. cut-stump painting of cleared woody individuals, rather than foliar spray applications).

Slashing of scrub and undergrowth is only to be carried out to the extent necessary to meet the safety requirements for separation between infrastructure and vegetation. Removal of ground-storey vegetation is not necessary, and impacts will only occur as a result of unavoidable machinery movements. Any temporary impacts to ground-storey vegetation will be monitored and managed to facilitate restoration.

Manual clearing/ felling will be used in areas that cannot be safely accessed by machinery and may also be used in areas of high and very high ecological sensitivity (including SAI TECs/ CEECs, per Section 7.6 of the BMP) identified in the constraints mapping, in order to minimise the potential for impacts. Where practicable, felled trees will remain *in situ* with the crowns/heads being cut/docked and laid flat. Fencing will be used to demarcate these areas.

The EIS identified that for conductor stringing purposes, all remaining shrubs within a 10-metre-wide area along the centre of the easement would need to be slashed to prevent snagging of the conductor. A stringing methodology has subsequently been adopted for the project that does not require a 10-meter-wide vegetation disturbance along the centre of the easement using drones and/or helicopters.

2.1.3 HAZARD TREE ZONE

This includes land located within and adjacent to the transmission line easement where selective tree removal, trimming or lopping would be undertaken to manage any risk of infringement on the VCR at Maximum Line Operating Conditions (max conductor sag and blowout). Earthworks are not required within this zone.

Minimising ground disturbance will be of particular focus. Clearing will aim to conserve mid- and ground-storey vegetation in this zone. Any adjacent and important habitat trees and features identified for retention will be clearly marked and included in ECMs to avoid disturbance during the felling activities. Each hazard tree will be individually marked and field assessed during detailed design to minimise impacts. Removed/felled vegetation will be left *in situ* with tree crowns cut/docked and laid flat. Areas of high ecological sensitivity identified in the constraints mapping would be fenced off and hand clearing/felling employed if required to avoid impacts to these areas.

LiDAR analysis was performed to identify hazard trees around the indicative disturbance area. The outer boundary of the mapped trees was then buffered to allow for a consolidated potential impact area. All hazard trees within and outside the easement corridor would be field assessed by a qualified Level 4 or Level 5 arborist with Tree Risk Assessment Qualification in accordance with Transgrid's Maintenance Plan – Easement and Access Tracks prior to the commencement of construction. Any hazard tree showing risk of failure due to health, structure or defect shall be removed.

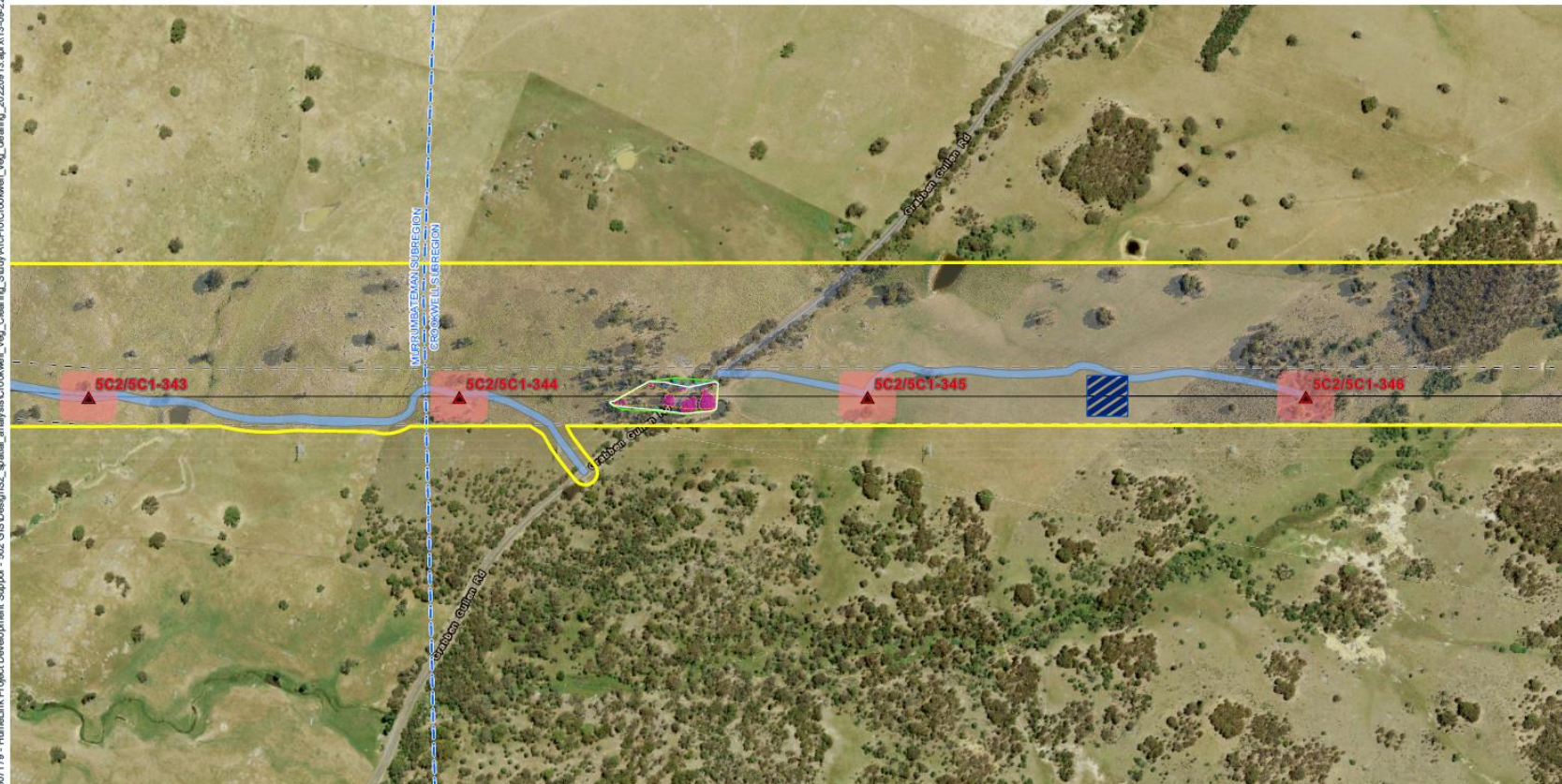
2.1.4 REDUCED VEGETATION CLEARING STRATEGY

The vegetation clearing methodology adopted by the Project has undergone numerous refinements to reduce the clearing extent as much as reasonably practicable from a baseline approach.

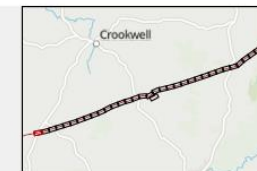
The HLE Project led initiatives listed below and described in Sections 2, 2.1.1, 2.1.2 and 2.1.3 above effectively reduce the projects vegetation disturbance area in accordance with CoA B25(a) and B30(d). In addition, these initiatives reduce the carbon sink lost through land clearing for the Project. Significant GHG emissions savings will be achieved through the implementation of these initiatives, summarized below:

- Micro-siting of the transmission line infrastructure to avoid biodiversity impacts where practicable
- Arborist field assessment of ECZ and tall growing trees as well as hazard trees in lieu of utilising LiDAR data only to remove all shrub and canopy strata
- Reduced Access Track and Tower Pad widths from EIS allowances
- Staggered tower leg design to reduce overall earthwork requirements
- The use of drones for transmission line stringing activities to eliminate the requirement of a 10m centerline clearance for stringing.

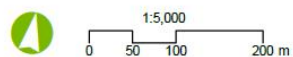
C:\Users\Carmen.Braz\Aurecon Group\507179 - HumeLink Project Development Support - 507 GIS Design\GIS2_spatial_analysis\Crookwell_Veg_Clearing_Study\AcPro\Crookwell_Veg_Clearing_20220913.apr\13-09-22\Carmen.Braz



- | | | |
|--|---|--------------------------------------|
| ▲ Tower Location | ■ Easement Electrical Clearance (6.4m) | □ GIS Cluster Boundary - Hazard Tree |
| — Transmission Line | ■ Easement Electrical Clearance (8.0m) | ■ Brake and Winch Site |
| - - - Transmission Line Easement (70m) | ■ Hazard Tree | ■ Tower Construction Area |
| ■ HumeLink Footprint v9 | ■ GIS Cluster Boundary - Easement Electrical Clearance (6.4m) | ■ Access Track Footprint |
| ■ IBRA Subregion Boundary | ■ GIS Cluster Boundary - Easement Electrical Clearance (8.0m) | |



Source: Aurecon, LPI



Projection: GDA 1994 MGA Zone 55

HumeLink Vegetation clearing change

Figure 1: Footprints

Figure 1 Indicative disturbance footprint.

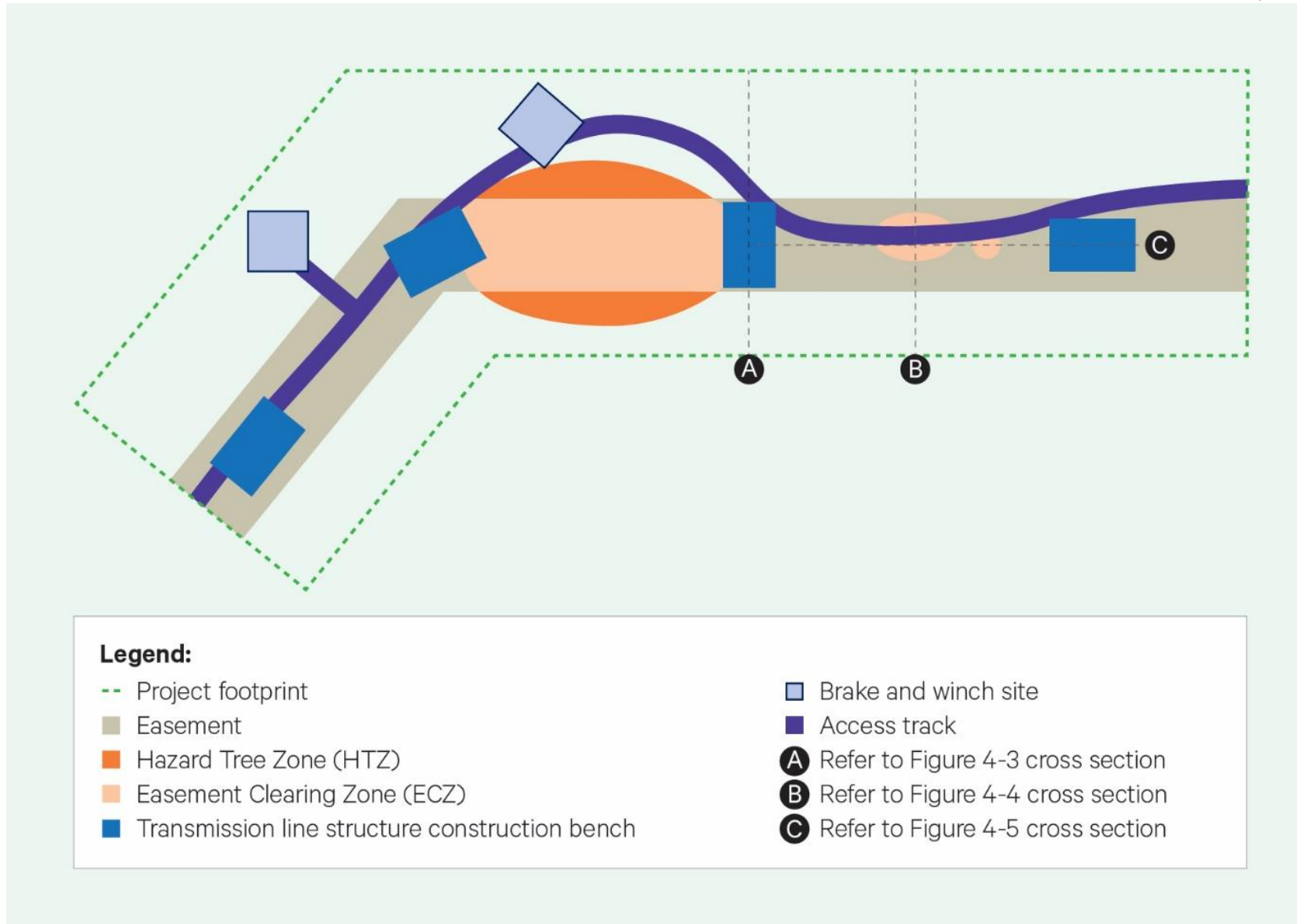


Figure 2 Indicative vegetation clearing zones within the project footprint.

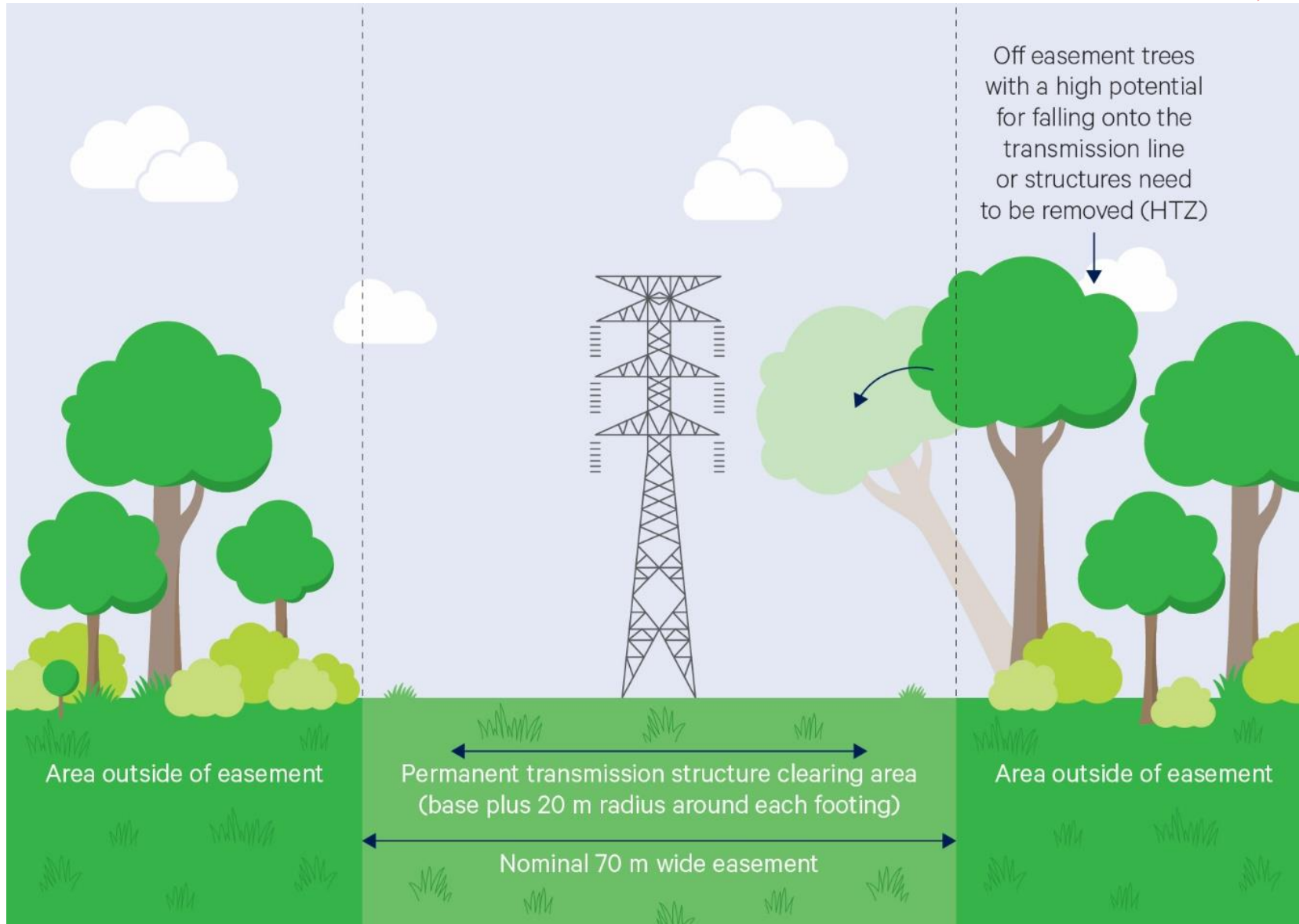


Figure 3 Indicative vegetation clearing around a typical transmission line structure (TCZ)

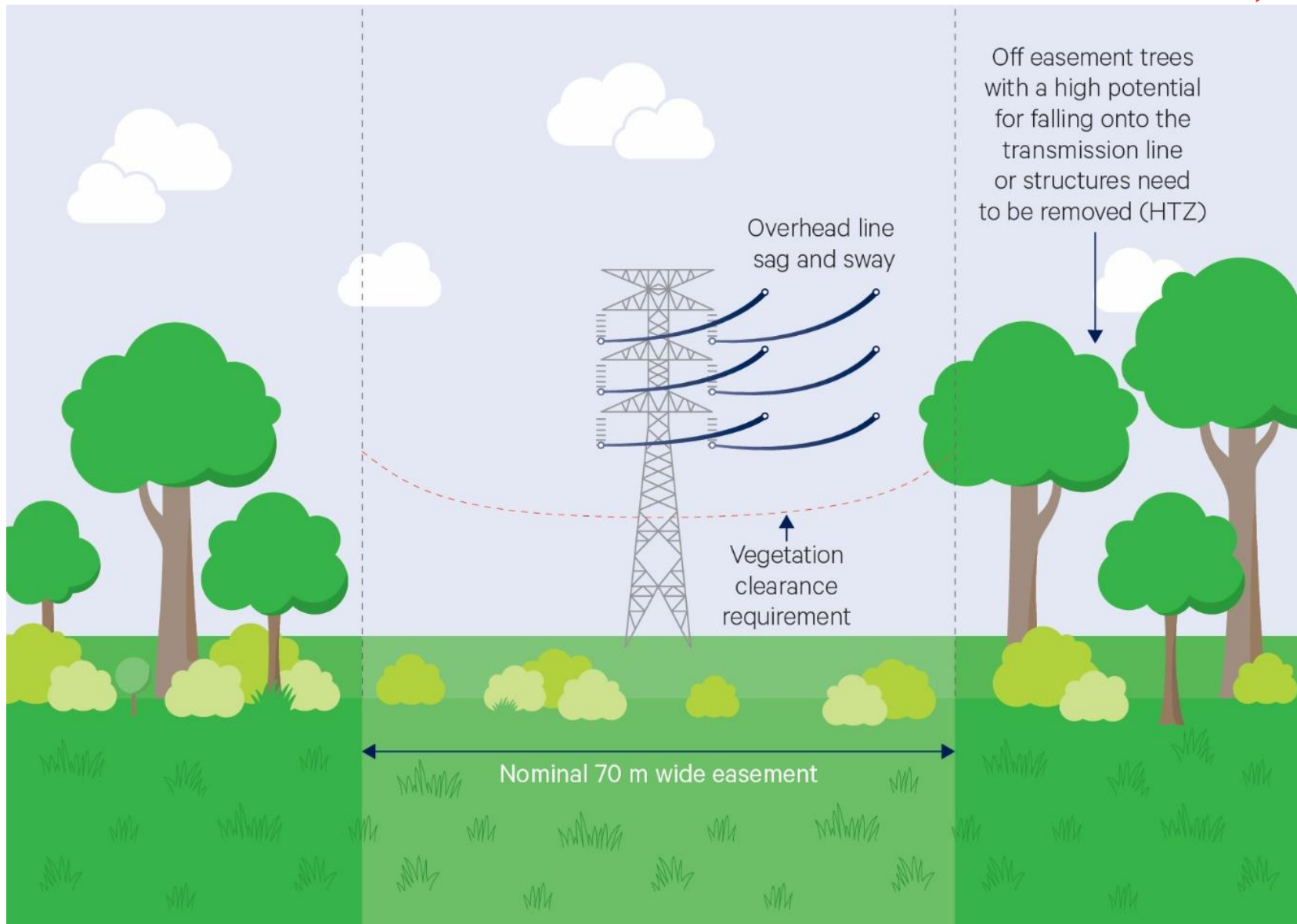


Figure 4 Indicative vegetation clearing within the easement (ECZ)t

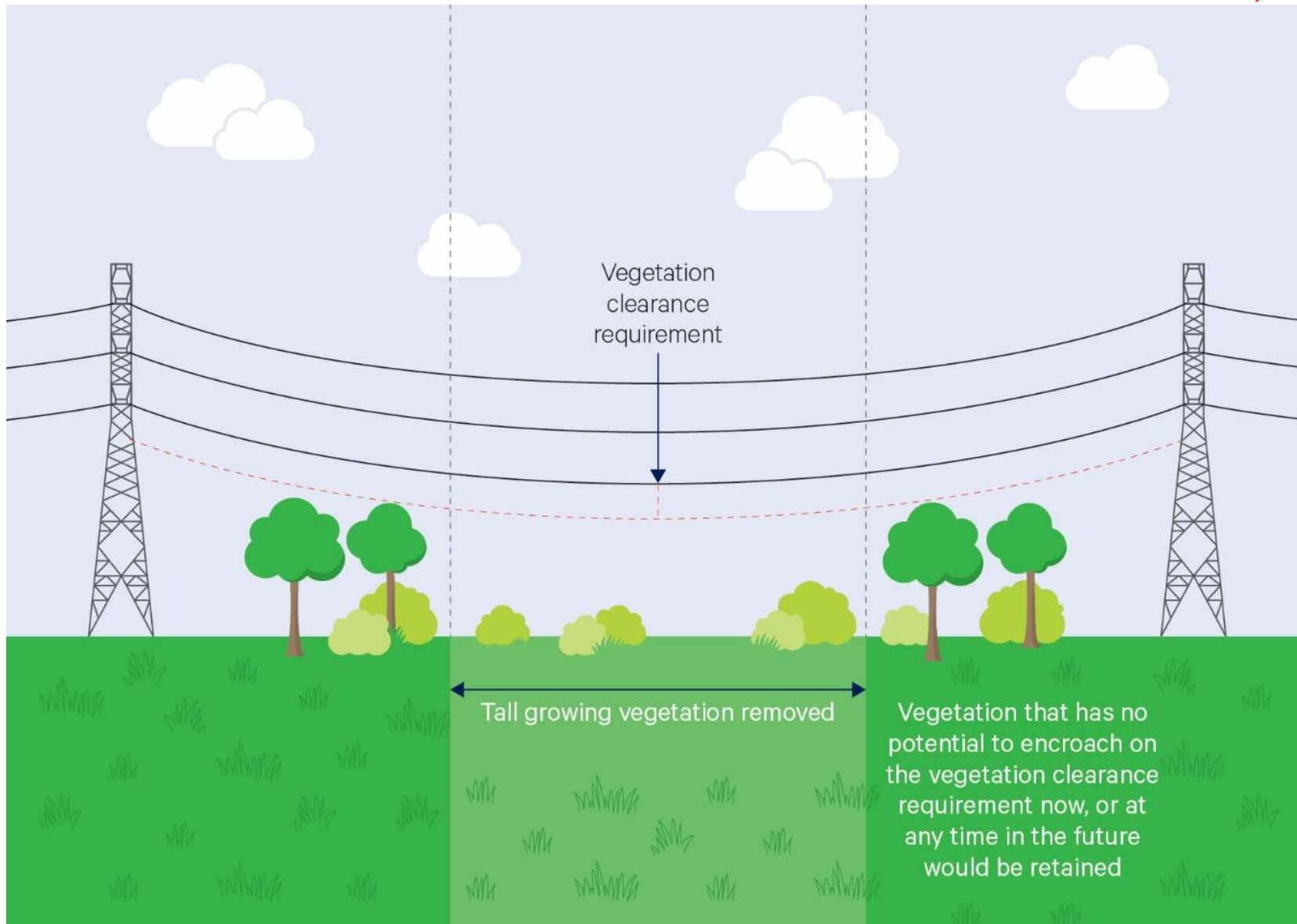


Figure 5 Indicative vegetation clearing mid-span (ECZ)

2.2 PROTECTED AREAS AND CONSERVATION LANDS

Impacts within protected areas (i.e. nature refuges) and conservation lands (i.e. established BioBank and Biodiversity Stewardship sites and Conservation Agreement sites) occurring within the Project footprint will be avoided or minimised through detailed design and micro-siting of Project infrastructure including transmission line structure benches and access tracks.

2.3 THREATENED ECOLOGICAL COMMUNITIES

Five BC Act listed threatened ecological communities (TECs) and two EPBC Act listed TECs occur within the HumeLink East Project footprint. The Revised BDAR determined five of these TECs are at risk of a serious and irreversible impact (SAIL). TECs relevant to the HumeLink East Project are summarised in Table 1.

Table 1. TECs within the HumeLink East Project footprint. E – Endangered; CE – Critically Endangered.

TEC Name	BC Act Listing	EPBC Act Listing	SAIL
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	-	CE	Yes
Alpine Sphagnum Bogs and Associated Fens	-	E	No
White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland – Critically Endangered Ecological Community	CE	-	Yes
Tableland Basalt Forest in the Sydney Basin and South-Eastern Highlands Bioregions Endangered Ecological Community	E	-	Yes
Coolac-Tumut Serpentine Shrubby Woodland in the NSW South-Western Slopes and South- Eastern Highlands Bioregions	E	-	Yes
Monaro Tableland Cool Temperate Grassy Woodland in the South-Eastern Highlands Bioregion	CE	-	Yes
Montane Peatlands and Swamps of the New England Tableland, NSW North Coast, Sydney Basin, South- East Corner, South-Eastern Highlands and Australian Alps bioregions	E	-	No

In accordance with UMM B1 and BD9, impacts to TECs and SAIL entities will be avoided through the below methods:

- TECs and biodiversity constraints mapping will be identified in Environmental Control Maps (ECMs). Biodiversity constraint levels are defined in Section 7.6 of the BMP.
- Sensitive areas and areas of high biodiversity value (including TECs and SAIL entities) will be prioritised for retention, guided by biodiversity constraints mapping.
- Detailed design and micro-siting of infrastructure and access tracks will reduce and avoid impacts to SAIL TECs and CEECs in accordance with UMM B1.

All retained TEC vegetation will be protected by establishing Biodiversity Exclusion Zones, described in Section 2.11 below. Exclusion fencing will be reviewed by ecologists prior to works commencing. Where avoidance of impacts is not possible and clearing of TEC vegetation is required, the following impact mitigation measures will be implemented:

- Pre-clearing induction of all contractors working in area to discuss location of TECs which are to be avoided.
- During clearing, an ecologist shall be on site at all times to monitor activities.
- Alternative line installation techniques that do not require clearing of the centreline, such as drone or helicopter, will be adopted.
- Clearing restricted to the identified tower worksite locations and new access track sections via the shortest route possible to avoid clearing.
- To minimise impacts on biodiversity and ground stability, ground and mid-storey cover vegetation would be retained, wherever possible, noting machinery tracking and mulch will partially impact species. Mulch cover will be reduced in depth to allow regeneration as much as possible.

- Heavy machinery use will be minimised, and trees will be slung down using tree climbers where practicable
- Mid and ground story vegetation will be conserved to the extent possible in the ECZ and HTZ, and manual felling may be undertaken when clearing SAIL TEC or CEEC vegetation within the ECZ to minimise impacts.
- In accordance with the Transgrid proposal 'AAM - HumeLink's SAIL - letter to BCD - September 2024_FINAL_v1', Transgrid will facilitate the design and delivery of a Local Area Management Plan (LAMP) which will guide a conservation initiative to compensate for SAIL impacts (targeting Box Gum Woodland restoration), and will include a monitoring program to measure Project success against LAMP performance targets.

If an unexpected impact to a TEC is identified during pre-clearing, the following responses will be actioned:

1. Stop work immediately if construction activities occur that result in unauthorised disturbance and/or impacts that are not permitted.
2. Ecologist assessment to determine if TECs have been impacted.
3. Investigate the event.
4. Determine if an incident or non-compliance has occurred in accordance with Section 3.8 and Section 3.9 of the CEMP
5. Works can only recommence once the Environment and Sustainability Manager has confirmed that appropriate measures to limit the potential recurrence of the event, have been implemented.

2.4 THREATENED FLORA SPECIES

In accordance with UMM B1, specific pre-clearing and clearing requirements for recorded threatened flora species locations are included in Table 2. Table 2 Management of recorded threatened flora species locations (pre-clearing and clearing)

Species	Management	Trigger Action Response
<i>Ammobium craspedioides</i> (Yass Daisy)	1. During detailed design and review of temporary design, opportunities to site items in locations where impacts to matters of biodiversity conservation significance are reduced, will occur, in accordance with UMM B1.	• Stop work immediately if construction activities occur that result in unauthorised disturbance and/or impacts that are not permitted.
<i>Leucochrysum albicans</i> var. <i>tricolor</i> (Hoary Sunray)	2. Pre-clearing threatened flora survey for areas that would be cleared or impacted to identify the extent of known patches of threatened flora species per Appendix H Flora and Fauna Monitoring Program. 3. Areas that will not be cleared will be delineated with flagging or other highly visible markers as exclusion fencing. 4. Exclusion fencing should be installed with a 1-metre buffer off any main stems to lower risk of root damage. 5. Exclusion fencing will be reviewed by ecologists prior to works commencing. 6. Threatened flora species location maps to be distributed to all contractors to notify location and significance. 7. Pre-clearing induction of all contractors working in area to discuss location of threatened flora species which are to be avoided. 8. During clearing, an ecologist shall be on site at all times to monitor activities. 9. Clearing restricted to the identified tower worksite locations and new access track sections via the shortest route possible to avoid clearing. 10. Alternative line installation techniques that do not require clearing of the centreline, such as drone or helicopter, will be adopted.	• Ecologist assessment to determine if threatened flora species have been impacted. • Investigate the event. • Determine if an incident or non-compliance has occurred in accordance with Section 3.8 and Section 3.9 of the CEMP • Works can only recommence once the Environment and Sustainability Manager has confirmed that appropriate measures to limit the potential recurrence of the event, have been implemented.

Species	Management	Trigger Action Response
	11. To minimise impacts on biodiversity and ground stability, ground and mid-storey cover vegetation would be retained, wherever possible, noting machinery tracking and mulch will partially impact species. Mulch cover will be reduced in depth to allow regeneration as much as possible. 12. Heavy machinery use will be minimised, and trees will be slung down using tree climbers where practicable	

2.5 THREATENED FAUNA HABITAT

Until the first verification reports are accepted by CPHR/DPHI, Table 4 details the measures that will apply to minimise impacts to threatened species that may be occupying habitat adjoining the disturbance footprint with species polygons that extend into clearing areas (in unsurveyed areas in particular). Buffer dimensions for threatened fauna, in line with TBDC information. Should any occupied habitat be identified as per Table 4, these will be shown in updated ECMs and accompanying spatial data.

Table 4 shows a list of species, with buffer dimensions and/or impact mitigation measures that would be applied for the minimisation of impacts to these species if detected.

Table 4 Species specific mitigation measures

Species	Pre-clearing survey method (if species is assumed or known in a clearing area)	Mitigation measures
Amphibians		
Booroolong Frog. Sloane's Froglet. Yellow-spotted Tree Frog.	Threatened frog habitats will be delineated in known or assumed habitats.	Threatened frog habitat will be clearly identified on construction planning maps. Project Ecologist to supervise installation of waterway crossings to relocate any individuals present per Section 4.3.
Cockatoos		
Gang-gang Cockatoo (breeding season = Oct-Jan). South-eastern Glossy Black-Cockatoo (breeding season = Apr-Aug).	Identification of suitable nest (i.e., hollow-bearing) trees will occur in known or assumed habitat. Where potential nest trees (i.e., a breeding pair observed inspecting the hollow) are identified, the tree will be inspected during the breeding season (see left) to confirm the presence of an active nest.	Potential nest trees will be clearly identified on construction planning maps. If actual nest trees (i.e., trees that are actively in use for nesting), known nests or nests with evidence of occupancy are identified, a 100 m temporary buffer (minimal disturbance zone) will be established until follow-up surveys confirm the individuals (adults and chicks) have left the hollow. The purpose of the buffer is to minimise construction impacts to breeding pairs and their chicks. The buffer can be removed outside of the breeding season. Activity in the buffer would be limited to low impact works such as use of existing tracks.
Forest Owls		

Species	Pre-clearing survey method (if species is assumed or known in a clearing area)	Mitigation measures
Barking Owl (breeding season = Oct-Jan). Masked Owl (breeding season = Apr-Nov). Powerful Owl (breeding season = May-Oct). Sooty Owl (breeding season = Mar-Sep).	Identification of suitable nest (i.e., hollow-bearing) trees will occur in known or assumed habitat. Where potential nest trees are identified (i.e., a breeding pair observed inspecting the hollow), the tree will be inspected during the breeding season (see left) to confirm the presence of an active nest. Monitoring is only required if clearing is proposed in the breeding season and would involve stag watching	Potential nest trees will be clearly identified on construction planning maps. If actual nest trees (i.e., trees that are actively in use for nesting), known nests or nests with evidence of occupancy are identified, a 100 m temporary buffer (minimal disturbance zone) will be established until follow-up surveys confirm the individuals (adults and chicks) have left the hollow. The purpose of the buffer is to minimise construction impacts to breeding pairs and their chicks. The buffer can be removed outside of the breeding season. Activity in the buffer would be limited to low impact works such as use of existing tracks.
Parrots		
Superb Parrot (breeding season = Sep-Nov).	Identification of suitable nest (i.e., hollow-bearing) trees will occur in known or assumed habitat. Where potential nest trees are identified (i.e., a breeding pair observed inspecting the hollow), the tree will be inspected during the breeding season (see left) to confirm the presence of an active nest.	Potential nest trees will be clearly identified on construction planning maps. If actual nest trees (i.e., trees that are actively in use for nesting), known nests or nests with evidence of occupancy are identified, a 100m temporary buffer (minimal disturbance zone) will be established until follow-up surveys confirm the individuals (adults and chicks) have left the hollow. The purpose of the buffer is to minimise construction impacts to breeding pairs and their chicks. The buffer can be removed outside of the breeding season. Activity in the buffer would be limited to low impact works such as use of existing tracks.
Raptors		
Little Eagle (breeding period = Aug-Oct). Square-tailed Kite (breeding period = Sep-Jan). White-bellied Sea-eagle (breeding period = Jul-Dec).	Pre-clearing surveys will identify trees with large stick nests or any adult with nesting material in known or assumed habitat. Where trees with large stick nests are identified on-site, diurnal nest watching will occur during the breeding season (see left) to confirm presence of breeding activity (eggs or chicks).	Nest trees will be clearly identified on construction planning maps. If breeding activity is recorded on-site during construction, a 100 m temporary buffer (minimal disturbance zone) will be established around the active nest until follow up surveys confirm the individual (adults and chicks) have left the nest. The purpose of the buffer is to minimise construction impacts to breeding pairs and their chicks. The buffer can be removed once chicks have fledged. Activity in the buffer would be limited to low impact works such as use of existing tracks.
Simple nesting birds		

Species	Pre-clearing survey method (if species is assumed or known in a clearing area)	Mitigation measures
Australian Painted Snipe. Black-chinned Honeyeater (eastern subspecies). Bush-stone Curlew. Diamond Firetail. Dusky Woodswallow. Flame Robin. Freckled Duck. Gilbert's Whistler. Grey-crowned Babbler. Hooded Robin. Malleefowl. Olive Whistler. Painted Honeyeater. Pink Robin. Scarlet Robin. Speckled Warbler. Varied Sittella.	Pre-clearing surveys will occur per Section 3 to record nests in known or assumed habitat.	Nests will be clearly identified on construction planning maps. If utilised nests are identified on-site, the Project Ecologist will determine a suitable buffer relevant to the identified species; to be established until follow up surveys confirm the individuals (adults and chicks) have left the nest. The purpose of the buffer is to minimise construction impacts to breeding pairs and their chicks. The buffer can be removed once chicks have fledged. Activity in the buffer would be limited to low impact works such as use of existing tracks.
Arboreal mammals		
Koala.	Per Section 3.3, final pre-clearing checks will occur in known or assumed habitat within 24 hours of clearing commencing to check for individuals in trees. Due to the transient nature of Koalas, an ecologist should be present for all clearing in koala habitat OR undertake a rapid survey the morning of the clearing. Koalas move overnight, so 24hrs prior won't provide any certainty.	If individuals are recorded on-site during pre-clearing surveys or construction, a 50 m temporary buffer (minimal disturbance zone) is to be established around the individual until follow up surveys confirm the individual has relocated. The purpose of the buffer is to allow for safe egress of the individual from the construction site. Activity in the buffer would be limited to low impact works such as use of existing tracks. Construction involving clearing or moving plant / earthworks within 50 m of Koalas traversing the site (on the ground) will be ceased until the Koala has safely left the area. Individuals observed in trees will be monitored by a suitably qualified ecologist or Environmental Coordinator to confirm they have voluntarily left

Species	Pre-clearing survey method (if species is assumed or known in a clearing area)	Mitigation measures
		(fled) the tree before the 50 m temporary minimal disturbance buffer is removed. Koalas traversing the site (on the ground) will be monitored by a suitably qualified ecologist or Environmental Coordinator until the animal has safely moved >100m off the site. CHPR are to be notified of Koala observations within 3 days of detection.
Hollow-dependent arboreal mammals		
Brush-tailed Phascogale (breeding period = Dec-Jun). Eastern Pygmy-possum (breeding period = Oct-Apr). Squirrel Glider (breeding period = Jun-Jan). Southern Greater Glider (breeding period = Mar-May). Yellow-bellied Glider (breeding period = Aug-Dec).	Identification of suitable nest (i.e. hollow bearing) will occur in known or assumed habitat. Where potential nest trees are identified, nocturnal surveys (stag watching) would commence following Stage 1 clearing during the appropriate breeding periods (if clearing during target species' breeding period cannot be avoided).	Potential nest trees will be clearly identified on construction planning maps. If actual nest trees (i.e., trees that the species are known to have used for nesting), known nests or nests with evidence of occupancy are identified, a 100 m temporary buffer (minimal disturbance zone) will be established until follow-up surveys confirm the individual (adults and joeys) have left the hollow. The purpose of the buffer is to minimise construction impacts to breeding individuals and their young. The buffer can be removed outside of the breeding season. Activity in the buffer would be limited to low impact works such as use of existing tracks.
Terrestrial mammals		
Broad-toothed Rat. Smoky Mouse. Spotted-tailed Quoll	Surveys in known or assumed habitat will record observations of burrow systems (Smoky Mouse); potential ground nests and distinctive scats (Broad-toothed Rat); and fallen logs, other animal burrows, small caves and rock outcrops (Spotted-tailed Quoll). Motion cameras (IR white-light cameras) will be used over 5 survey nights to confirm suspected burrows/nests/dens.	Hand clearing will occur within 50 m buffer of recorded burrows/nests/dens unless camera surveys confirm burrows are not from target species. Link confirmed burrow/nests/den sites in the ECZ or HTZ to adjoining vegetation on each side of the disturbance zone by ground corridors consisting of a hand clearing zone and retention of ground refugia over a minimum 20 m width.
Microbats		
Corben's Long-eared Bat.	Pre-clearing surveys in known or assumed habitat will identify hollow-bearing trees or known roost trees.	A 50 m temporary buffer (minimal disturbance zone) is to be established around breeding individuals (i.e., 8 or more individuals roosting together).

Species	Pre-clearing survey method (if species is assumed or known in a clearing area)	Mitigation measures
Eastern False Pipistrelle. Greater Broad-nosed Bat. Little Pied Bat. Large Bent-winged Bat. Large-eared Pied Bat. Southern Myotis. Yellow-bellied Sheath-tail-bat.	Confirm presence of karst roosting habitat for bats (Large-eared Pied Bat) within 1km of high impact works such as blasting and crushing. If karst roosting habitat are present, complete inspection to confirm use by bats prior to undertaking activities during the breeding season). Pending on access to private land within 1km of the high impact works. Inspection of existing culverts, bridges or other structures near waterways for known or assumed Southern Myotis (or other bat) roosts prior to demolition or modification. Inspection will utilise thermal detectors to confirm presence/absence. Proximity to waterway might be more favourable for some bats, but all structures should be checked for bats irrespective of proximity to waterway.	Evidence of bats in culverts or other structures will trigger adaptive response – a bat exclusion plan is to be developed in consultation with CPHR. Detailed design will incorporate conductor line-marking techniques to minimise bird and microbat strikes within one kilometre of wetland/riverine habitats.
Reptiles		
Alpine She-oak Skink.	Pre-clearing surveys in known or assumed habitat will target beneath litter, rocks, logs, other ground debris, and within grass tussocks.	In areas of known or assumed habitat, the Project Ecologist will supervise all vegetation clearing activities as this species preferring tree-less or very lightly treed areas that contain tussock grasses, low heath or a combination of both. Works are to cease if individuals are observed until they are confirmed to have relocated or fled by the Project Ecologist.
Pink-tailed Legless Lizard.	Pre-clearing surveys in known or assumed rocky habitat will include turning over suitably sized rocks (300 mm wide and 50 mm deep).	If the species is confirmed to be present in a rocky outcrop within the TCZ that cannot be avoided, a relocation plan is to be prepared in consultation with CPHR. The plan should identify how individuals will be relocated to other areas of suitable habitat with rocky outcrops, including location of recipient site, capture and transport protocols and name and qualifications of the individuals to complete the relocation. If the species is confirmed to be present in a rocky outcrop within the ECZ, a 50 m temporary buffer (minimal disturbance zone) around the areas of habitat is to be established and clearly delineated. Any vegetation clearing within the

Species	Pre-clearing survey method (if species is assumed or known in a clearing area)	Mitigation measures
		buffer must be completed by hand with heavy machinery excluded.
Striped Legless Lizard.	Pre-clearing surveys in known or assumed habitat will include active searches of individuals on the ground surface, under partially imbedded rocks, ground debris, soil cracks and within grass tussocks.	In areas of known or assumed habitat, the Project Ecologist will supervise all vegetation clearing activities as this species prefers grasslands. Works are to cease if individuals are observed until they are confirmed to have relocated or fled by the Project Ecologist.
Rosenberg's Goanna (breeding period = Nov-Mar).	Pre-clearing surveys will include the demarcation of termite mounds suspected of breeding.	Potential breeding termite mounds will be clearly identified on construction planning maps. If nest termite mounds are identified, a 100 m temporary buffer (minimal disturbance zone) will be established until follow-up surveys confirm the hatchlings have left the mound. The purpose of the buffer is to minimise construction impacts to hatchlings. The buffer can be removed outside of the breeding season. Activity in the buffer would be limited to low impact works such as use of existing tracks.
Flora		
<i>Acacia ausfeldii</i> . <i>Ammobium craspedioides</i> . <i>Bossiaea fragrans</i> . <i>Caesia parviflora</i> var. <i>minor</i> . <i>Caladenia concolor</i> . <i>Caladenia montana</i> . <i>Calotis glandulosa</i> . <i>Calotis pubescens</i> . <i>Cullen parvum</i> . <i>Diuris tricolor</i> . <i>Glycine latrobeana</i> . <i>Grevillea wilkinsonii</i> . <i>Leucochrysum albicans</i> subsp. <i>tricolor</i> . <i>Persoonia marginata</i> . <i>Pimelea bracteata</i> .	Individuals will be identified within known or assumed habitats subject to partial clearing (i.e., ECZ/HTZ), including those detected during Revised BDAR and Biodiversity Assessment Verification surveys.	Known threatened flora locations will be clearly identified on construction planning maps. A 30 m buffer to be delineated around known records of threatened flora within a 20m buffer of the Project impact area in partial clearing zones (i.e., ECZ/HTZ), with vegetation clearing works limited to hand clearing. No clearing or plant use will occur outside the Project impact area or within connectivity corridors (excluding access tracks).

Species	Pre-clearing survey method (if species is assumed or known in a clearing area)	Mitigation measures
<i>Pomaderris cotoneaster.</i>		
<i>Prasophyllum bagoense.</i>		
<i>Prasophyllum innubum.</i>		
<i>Prasophyllum keltonii.</i>		
<i>Prasophyllum petilum.</i>		
<i>Pterostylis alpina.</i>		
<i>Pterostylis foliata.</i>		
<i>Pterostylis oreophila.</i>		
<i>Pultenaea humilis.</i>		
<i>Senecio garlandii.</i>		
<i>Swainsona recta.</i>		
<i>Swainsona sericea.</i>		
<i>Thelymitra alpicola.</i>		
<i>Thesium australe.</i>		
<i>Xerochrysum palustre.</i>		

2.6 THREATENED FROG HABITAT

Where threatened frog habitats, including Booroolong Frog, have been identified in the Project footprint, the following avoidance measures will be implemented in accordance with UMM B8:

- Installation of water crossing will be avoided
- Disturbance within 50 m of the top of the bank of the waterway (including riparian vegetation) will be avoided.

Where avoidance is not possible:

- Waterway crossing designs should avoid instream structures to minimise the potential for hydrological change, erosion, and sedimentation impacts of downstream environments
- The location of waterway crossings will be determined in consultation with the Project Ecologist to avoid or minimise impacts to potential habitats or ecological features
- Develop site-specific erosion and sedimentation control plans to ensure the potential for erosion and sedimentation impacts are minimized as far as practicable, including monitoring the success of erosion and sediment control measures
- Develop and implement site-specific hygiene protocols (e.g. cleaning of plant machinery), to minimise the spread of pathogens and exotic weeds during and post-construction (in line with Hygiene protocols for the control of diseases in Australian frogs [DCCEEW, 2011]) and in accordance with Appendix D Biosecurity Management Plan.

2.7 CONNECTIVITY CORRIDORS

Fauna connectivity corridors will be managed in accordance with Appendix F Connectivity Strategy and included in ECMs. Where new or existing access tracks intersect with the connectivity corridor, these access tracks will be used during the construction period to limit the need for additional clearing which would otherwise be required outside of, or around, the connectivity corridor.

Minimising clearing through only removing the vegetation that is within, or could grow into or fall into, the Transgrid's minimum VCR will result in reduced (selective) clearing, particularly in woodland areas. This will result in reduced fragmentation of habitats and increased retention of the ground and shrub layers.

Connectivity corridors are to be located where they provide benefits to the local landscape. The following locations will be considered for connectivity corridors:

- Major riparian crossings
- Areas joining the proposed biodiversity stewardship sites and/or conservation reserve estate
- Transmission line structure locations that occur in woodland vegetation at strategic locations (i.e. vegetation corridors with moderate to high landscape connectivity, and with moderate to high levels of fauna activity/ movement). This should include areas with existing structural vegetated connectivity linking the connectivity corridor with core habitat areas on either side of the Project alignment.

The connectivity corridors will be 20m wide and will typically be located in valleys or adjacent to towers where the height of the transmission line is greater, and an increased vegetation height can be accommodated.

2.8 WATERCOURSES

Numerous large streams and waterways are located within the Project area as detailed in Table 3.

Table 3 Watercourses within the Project area

Activities within the riparian zones of these watercourses will be managed to minimise impacts to aquatic environments wherever practicable. The riparian zone is defined by the Guidelines for riparian corridors on waterfront land (DPI – Office of Water, July 2012). In accordance with UMM B27, the following measures for riparian zones will be undertaken to the greatest extent practicable:

- Transmission line structures will be located and constructed to minimise impacts on vegetated riparian zones (VRZs)
- The final transmission line easement will target narrow crossing points of waterways and riparian areas clear of vegetation
- Shrub or ground stratum native vegetation within vegetated riparian zones will be protected to the greatest extent practicable.
- Vegetation clearing will be limited to the tree stratum only, with trunk bases retained in situ (vegetation to remain at four metres and 10 metres based on the disturbance area)
- Should the riparian zone be subject to a connectivity corridor, vegetation within this connectivity corridor will be cleared at 10 metres in height

- If encroaching on VCR trees will be removed as close as possible to ground level and root balls will be left in situ wherever practicable
- Where threatened species are known to occur, work methods will avoid or minimise impacts by limiting clearing wherever possible and delineating their habitat outside the final disturbance area as no-go zones
- Work near waterways will be undertaken to avoid impacts such as herbicide drift/overspray, erosion, and damage to the banks
- Disturbance of bush rock in riparian areas will be avoided wherever practicable
- Riparian areas subject to disturbance will be progressively stabilised and rehabilitated (see Section 7.8 of the BMP).

Waterway crossing activities will be managed through detailed design and micro-siting processes to minimise and avoid potential impacts on aquatic habitats and disturbance to waterways (bed, banks and associated riparian zones) as per UMM B30. The following measures would be implemented:

- Existing crossings will be re-used or upgraded in preference to establishing new crossings
- The crossing design and construction work sites will minimise disturbance to any native vegetation, including instream, fringing, and riparian vegetation within the access track alignment and the disturbance areas
- Waterway crossings will be constructed perpendicular to the flow of the water and be positioned away from channel bends (where erosive forces are typically greatest). Crossings will be preferably located in straight stream sections with well-defined channel geometries and shallow stream gradients, in stable dry reaches
- Micro-siting will avoid direct and indirect impacts on riverine features such as riffles and rapids and sensitive habitat features (i.e. snags, coarse woody debris, instream macrophytes, boulders)
- Where instream structures are required, considerations of potential flooding and erosive effects will be made in the design and construction of the crossing.

Construction works will be carried out in such a manner that the least practicable disturbance to actual ground cover and contours is caused in the following areas:

- Steep or Highly Erodible lands where slopes are in excess of 18 degrees from the horizontal
- Protected Riparian Land (PRL) is defined as land within 20 m of the bed or bank of a prescribed stream. Generally, named watercourses are classed as protected riparian land, however, some unnamed watercourses may be classed as protected riparian land
- Waterfront land (40 m from the top of the bank).

Where appropriate and practicable, the following will be incorporated into construction methodologies for waterway crossings:

- Minimise disturbance to native vegetation, including instream, fringing and riparian vegetation within the indicative disturbance area
- Areas of native vegetation to be retained during works will be demarcated
- Waterway crossing work will be constructed during no or low flow conditions and under calm weather conditions and timed to occur outside of any locally high flow periods
- Silt curtains or coffer dams will be deployed around instream work sites where required, to protect against any impacts to water quality or indirect impacts to retained vegetation. These measures will be situated to avoid blocking fish passage wherever practical and be removed as soon as they are no longer required
- Flow diversion measures will be installed on bunded waterway crossings as appropriate or where construction during no or low flow conditions is not feasible. Flow diversion measures may include pumps to ensure that water can be moved from one side of blockages to the other, with screened inlets to prevent the entrapment of aquatic fauna and outlet structures that are designed to avoid scouring the channel. Where waterways are bunded or flow obstructed, all obstructions to flow will need to be removed as soon as practical after watercourse crossing construction has been completed
- Appropriate erosion and sediment controls that consider potentially flood-prone areas will be employed to manage water quality impacts and indirect impacts to retained vegetation
- Waterway bed and bank material excavated during construction will be stockpiled outside of the active channel and avoid riparian vegetation. Any material excavated from the bed of waterways will

be stockpiled separately from other materials and returned to the waterway bed following the completion of construction work

- If the stockpiling of sediment or soil is required, it will be located as far away from waterways as practicable and managed so that it is secure against flooding and runoff to prevent any sediment from entering waterways. Adequate erosion and sediment control measures will be in place to protect stockpiled sediment against runoff during rainfall or flooding
- Only excavated natural materials (ENM) or virgin excavated natural materials (VENM) will be used as fill during reclamation work, i.e. no contaminated material, building or demolition rubble will be used as fill in any stream crossings
- Chemicals will be stored in adequate bunding (in accordance with Australia Standard 1940 – The storage and handling of flammable and combustible liquids) as far away from streams as practicable and appropriately protected against flooding or runoff. Spill kits will be made available, and a spill response plan will be developed
- Plant refuelling will occur as far away from streams as possible and appropriate spill prevention measures (such as diversion bunds/cut-off drains upslope and drip trays and spill kits) will be implemented when refuelling.

2.9 ACCESS TRACKS

Design and micro-siting of new access tracks will avoid or minimise impacts to breeding and sheltering habitat for fauna including habitat trees and rocky habitats (i.e. rock outcrops, large boulders, piled rock, and rock features that provide potential sheltering).

Access tracks will be used as necessary for the construction work and as far as is practicable. Access track corridors will be established with consideration to site contours and terrain to minimise cut/fill and vegetation clearing. Track construction will be carried out to cause minimum disturbance to soil and vegetation both on and adjacent to the track.

For any temporary access tracks, the disturbed surfaces and formed areas will be revegetated in accordance with the approved CEMP or Managing Urban Stormwater: Soils and Construction – Volume 2C Unsealed Roads (DECC, 2008a) (see Section 7.8 of the BMP). In addition, other erosion control mechanisms will be put in place during the initial track construction work to contain any sediment that may erode from the disturbed surfaces in accordance with the Soil and Water Management Plan (SWMP).

2.10 AREAS SUBJECT TO PARTIAL CLEARANCE

Prior to partial clearance works, all relevant Project personnel involved in vegetation clearance, including relevant sub-contractors, will be trained on the requirements for partial clearance areas (ECZ and HTZ), as detailed in Section 2.1.2 and Section 2.1.3 of this Procedure.

Areas that are subject to partial clearance (ECZ and HTZ) will be progressively monitored from the commencement of construction in accordance with Appendix H Flora and Fauna Monitoring Program.

2.11 BIODIVERSITY EXCLUSION ZONES

Biodiversity exclusion zones for retained vegetation and retained threatened species habitats will be confirmed by a suitably qualified ecologist and identified as 'No disturbance' zones prior to the commencement of clearing or any site activity that could damage the vegetation within the exclusion zone.

These areas will be identified as a no-go zone within approved plans and on-site physical demarcation will be required with high visibility protection fencing including signage clearly identifying these areas as no-go zones. Prior to clearing, biodiversity exclusion zones will be included on ECMs and Project GIS with requirements for the protection and management of no-go zones will be addressed as a part of the site induction.

3. PRE-CLEARING PROCEDURE

The following tasks are required to occur before clearing:

1. A suitably qualified and experienced ecologist will be engaged for the Project (the Project Ecologist)
2. A clearing and grubbing work pack, Environmental Work Method Statement (EWMS) and/or ECMs will be developed for construction teams
3. Opportunities to retain and protect existing vegetation within the disturbance area will be identified during construction planning through a review of design and construction methodologies
4. The predicted extent of clearing of native vegetation will be checked against the extent of clearing as permitted by Condition B25 of the Infrastructure Approval. The predicted extent of clearing will also consider the type of clearing (e.g. temporary or permanent)
5. The extent of clearing required for construction of infrastructure is to be surveyed and marked out on site
6. The Project Ecologist is to undertake pre-clearing surveys and confirm the location and extent of any biodiversity exclusion zones as well as verify the clearing extent as permitted by Condition B25 of the Infrastructure Approval
7. The Supervisor is to ensure the clearing extent, and any exclusion and protection zones are delineated in accordance with the requirements before clearing works commence. In areas that are not adjacent to exclusion zones (refer below), the clearing limits will be delineated using regularly placed pegs or identification markers at a maximum distance of 3 metres apart. In locations adjacent to exclusion zones or where pegs and identification markers will not be suitably visible (for example, if obscured by existing vegetation), highly visible barrier or star pickets with tape such as colour-coded UV-stabilised rope, bunting, nightline, or other similarly robust and durable materials will be used ensuring a clear marking line. The two key exclusion zones are:
 - **Biodiversity Exclusion Zones** – includes areas of retained vegetation and retained threatened species habitats such as SAIL, TECs, MNES, threatened flora and fauna, retained habitat trees etc. Delineation of these areas will be completed per the requirements above and the extent will be verified by a suitably qualified ecologist prior to the commencement of clearing or any site activity that could damage the vegetation within the exclusion zone. The ecologist will consider identified threatened flora populations and PCTs that are not of a growth form height that would ever require management
 - **Heritage and Contamination Exclusions Zones** - Refer to the Heritage Management Plan and Soil and Water Management Plan, respectively.
8. The Environment team will ensure delineation is installed consistent with the requirements detailed above to reduce the risk of error or misinterpretation of boundaries and that exclusion zones delineated are consistent with delineation for no-go zones identified within other approved plans and maps
9. Any relevant findings from the pre-clearing survey will be used to update and confirm the accuracy of ECMs and/or geospatial information systems (GIS).
10. The construction workforce will be supplied with environmental control maps (ECMs) showing clearing boundaries, exclusion zones and the location of threatened flora or vegetation that is to be retained through the relevant Work Packs and/or Work Method Statements
1. The Supervisor, clearing operators and Environment team will discuss any findings from the pre-clearing survey during the daily pre-start meetings as required including changes to the sequence of clearing, exclusion zones, avoidance areas, or habitat features
2. A Clearing and Land Disturbance Permit will be approved by the Environment and Sustainability Manager or delegate before clearing activity commences.

3.1 PRE-CLEARING SURVEY

Pre-clearance surveys will be undertaken prior to clearing or ground disturbance activities in a given area. The following steps will be completed prior to clearing commencement by the Project Ecologist who will:

- Survey the clearing extent (refer to Section 2),

- In response to the request for additional mitigation measures for threatened entities in unsurveyed areas, the project has adopted a 50 m buffer for pre-clearing surveys beyond the direct disturbance footprint. This buffer will apply to areas mapped as Moderate to Very High condition native vegetation, excluding access tracks. Any incidental observations of threatened species or habitat features outside the direct impact area—regardless of whether a 50 m buffer is applied—will be documented in pre-clearing survey reports. It is acknowledged that implementation of the 50 m buffer is subject to property access permissions and may be constrained by the approved project boundary. Within these limits, the project will make all reasonable efforts to achieve the buffer as described.
- Pre-clearing surveys must be extended to a 30m buffer requirement to avoid threatened flora species not being offset.
- Identify, inspect and demarcate habitat trees that are suspected to accommodate fauna
- Document, mark, photograph and record other habitat features (e.g. rocky outcrops, surface rock, dead wood, logs) for possible retention or relocation
- Survey, inspect, and confirm the presence of nests, including raptor, within the survey area
- Identify priority weed species present
- Count (or estimate if over 10 individuals are present) the number of individuals observed for each priority weed species
- Record, photograph and mark any signs of pathogens (i.e., myrtle rust, tree dieback, sick or dead frogs) in the survey area
- Record, photograph and mark evidence of pests (e.g., alert species or priority species identified in Section 2 of this Plan) in the survey area
- Note the NSW property lot in which each weed species or evidence of pest or pathogen species are observed, to determine which property areas require management
- Confirm the presence of karst roosting habitat for bats within areas identified as high potential karst habitats and if identified, implement adaptive safeguards to mitigate impacts to roosting individuals (refer to Section 1)
- Record GPS coordinates for all identified habitat trees, nests and habitat features during the pre-clearing survey
- Survey hollow bearing trees within the survey area, and confirm hollows are unoccupied by conducting a visual inspection of each identified accessible hollow, either by climbing the tree (with a ladder or rope access) or from the ground with an extendable endoscope
- Where the Project Ecologist identifies hollow-bearing trees with a high likelihood of threatened species occupancy (evidence may include feathers or staining at the entrance of the hollow, or scars, claw marks or staining on adjacent trees), conduct a dusk stag-watch, where possible
- Record the total number of hollows that will be incorporated into the Supplementary Hollow and Nest Strategy (Appendix E)
- Confirm that artificial hollows are in place (where required) in suitable locations
- Capture and/or remove fauna that have the potential to be disturbed as a result of clearing activities and relocate any captured fauna into nearby habitats, documenting the location of any fauna release sites off easement. Relocation of fauna should occur outside of fauna breeding seasons where possible.
- Prior to any disturbance of waterway banks, a thorough inspection by a qualified ecologist will be undertaken for aquatic fauna and frogs
- Where works are to be undertaken within the 50m of aquatic habitat (rivers, creeks, dams etc.), all vegetation, rocks, logs and other shelter are to be carefully inspected for frog species and all captured frogs are to be relocated to adjacent habitats away from impacts
- Confirm any monitoring locations

Where fauna is encountered during pre-clearing surveys and vegetation clearing occupying habitat features during breeding seasons, i.e., nest, drey, hollow, consideration will be provided to retaining vegetation until fauna is able to be safely relocated where possible.

If any unexpected finds, the Unexpected Threatened Species Finds Procedure (Appendix A) will be followed.

Pre-clearing surveys will involve parallel field traverses within each pre-clearance area. The width of parallel traverses will depend on factors affecting line of sight, including vegetation formation, density and terrain. The spacing of field traverses will be determined at the time of survey by the attending ecologist, and will be appropriate to local conditions. Generally, the recommended spacing of parallel field traverses is 70 m wide or less. The distance between parallel field traverses will be recorded in the pre-clearing report.

3.2 PRE-CLEARING REPORT

Pre-clearing reports are to be prepared iteratively and will include:

- Description of the presence of threatened flora species, including a description of fauna habitat
- Description of the presence or evidence of threatened fauna species (including fresh scats, scratches and remains of prey)
- Description and photographs of identified fauna habitat
- Description of identified weeds
- Recommended actions to avoid the potential for harm to any fauna during clearing, including protocols for staged clearing of vegetation, safe tree felling, and a two-stage tree and log removal process
- Live animal sightings, captures and any releases, including the location of fauna release sites off easement
- Measures to avoid disturbance to surrounding and/or retained vegetation during clearance works

Reports will be prepared by the Project Ecologist and provided to Transgrid within 3 months of the commencement of the relevant activity. Reports may be provided to other agencies upon request. Outcomes of the pre-clearing survey will be incorporated into the relevant ECM and Clearing Permit as required.

3.3 CLEARING PERMIT

Following the completion of pre-clearing surveys, a Clearing Permit will be completed and signed off by the relevant parties including the Project Ecologist and AGJV Environment Manager, prior to commencement of clearing. Any management measures required under the BMP or other actions identified during the pre-clearing survey will be incorporated into the Permit.

3.4 CHANGED IMPACTS AND BAM ASSESSMENTS

Changed impacts may affect areas either inside or outside of the biodiversity study area.

Project changes within the biodiversity study area can be considered against the known biodiversity values that were confirmed in accordance with the BAM, as documented in the BDAR. Most commonly, these types of changes include altered tower locations to minimise environmental disturbance and improve constructability, changes to construction site layouts, and the provision of alternative access. This can result in slight differences in impacts compared to the BDAR. If a proposed change could affect a location of native vegetation or threatened species habitat outside of the biodiversity study area, a supplementary biodiversity survey (prepared in accordance with the BAM) would be carried out by an Accredited Assessor prior to disturbance to confirm the biodiversity values present and to allow potential impacts to be identified and avoidance and mitigation measures incorporated where possible.

Typical situations that can require additional BAM assessment outside of the biodiversity study area may include the following:

- Areas adjacent to assessed access tracks to allow for spatial inaccuracies in the georeferenced aerial imagery used for impact assessment purposes and alterations based on actual site conditions
- Areas where alternative access arrangements might be required based on landholder preferences, ground conditions or topography not understood during the EIS phase
- Areas where alternative access is required to avoid access through, and impacts within, locations with sensitive heritage and biodiversity values

- Parts of road corridors in the vicinity of approved access points and internal property access roads to account for all potential ground disturbance during access point installation, including signage within the road reserve on approach to the access points, track installation, upgrades, and maintenance
- Areas around water supply points to account for any disturbance to vegetation required during access upgrades or that might occur due to Project-related vehicle movements.

When finalising the design and construction methodology, the Project will reduce impacts to the greatest extent practicable in accordance with Updated Mitigation Measures (UMMs) B4 and B28 and the requirements of Condition B30. The Project will assess any of these proposed changes to confirm that:

- The works can be carried out in compliance with the conditions of the Infrastructure Approval and EPBC Act Permit
- The works can be carried out generally in accordance with the EIS (including the BDAR)

It is noted that clearing cannot be carried out until an additional BAM assessment is undertaken and changes have been assessed against the CoAs.

Clearing that would result in an exceedance of the limits included within Appendix 2 of the Approval will not occur unless otherwise approved by the Secretary.

4. STAGED OR NON-STAGED CLEARING

All Project areas that need to be cleared will be subject to staged or non-staged clearing. Staged clearing occurs in locations where the Project Ecologist identifies habitat features and is typically referred to as 'two-stage clearing.' The two processes are outlined below.

Both two-staged and non-staged areas will be identified in the Clearing and Land Disturbance Permit. Both areas are subject to the requirements of the disturbance areas per the Clearing and Land Disturbance Permit.

4.1 CLEARING – NO HABITAT FEATURES IDENTIFIED (ONE-STAGE CLEARING)

If no habitat features have been identified by the Project Ecologist in the pre-clearing surveys, then a two-stage clearing process is not required and clearing can be undertaken in a single step without the ecologist present. An example is cropland/agricultural pasture area, outside of threatened species habitat (i.e. species polygons).

All other demarcation and flagging are to occur as required by the Clearing and Land Disturbance Permit.

4.2 CLEARING – HABITAT FEATURES IDENTIFIED (TWO-STAGE CLEARING)

Two-stage clearing is required where the Project Ecologist has identified habitat features during the pre-clearing surveys. For these locations, the Project Ecologist must survey the clearing area within 24 hours or immediately before clearing to:

- Obtain updated information on fauna and flora habitat that is present, including:
 - Inspection of identified habitat features for evidence of fauna occupation
 - Identify any fauna that will require relocation before clearing
 - Document the location of any fauna release sites off easement
 - Demarcate any newly identified habitat and confirm that habitat trees are prominently marked/tagged
 - Confirm that habitat trees to be retained within and adjacent to the clearing extents are prominently marked/tagged
 - Capture and relocate any identified non-mobile fauna
 - Confirm that nest boxes are in place (where required) or suitable locations for installation have been identified
- Collect data on any newly identified threatened species in the area.

4.2.1 INITIAL CLEARING – REMOVAL OF NON-HABITAT VEGETATION

In this first stage, non-habitat vegetation will be removed, and all marked habitat features will be retained until the final stage of clearing. This allows respite between the initial disturbance and the final removal of habitat. The changed environment and the disturbance from non-habitat vegetation clearing should encourage residing fauna to relocate voluntarily without human handling.

A respite period of a minimum of 24 hours after the removal of non-habitat vegetation is required to allow resident fauna the opportunity to vacate the remaining habitat before final clearing commences.

4.2.2 FINAL CLEARING – REMOVAL OF HABITAT VEGETATION

The Project Ecologist must be onsite to supervise the final clearing works. They will:

- Thoroughly inspect all hollows that are accessible from the ground immediately before clearing
- Carefully supervise the removal of habitat features and hollows when trees are dropped to the ground
- Ensure detected fauna are encouraged to self-relocate or capture and relocate any encountered fauna to pre-identified release sites
- Ensure that any injured wildlife is transported to a veterinarian or wildlife carer

- Where breeding fauna or dependent young are detected during the clearing works, consult with a licensed carer to determine whether the animal/s require ongoing care or can be safely relocated to an adjacent habitat.

Locations of fauna release (including GPS coordinates) will be recorded in a post-clearing report as detailed in Section 5. Once all fauna habitat inspections and any required fauna removal are complete, the remaining vegetation clearing will commence.

Salvage and relocation requirements of habitat features are detailed within the Supplementary Hollow and Nest Strategy (Appendix E) and will be included in EWMS, Work Packs and ECMs and communicated to staff.

5. POST-CLEARING REPORT

Project Ecologists will prepare post-clearing reports quarterly during clearing works and will include:

- Information on clearing operations, dates, procedures, and areas
- The type of clearing (i.e., TCZ, ECZ)
- A breakdown of the spatial extent and type of clearing of each mapped Plant Community Type
- A breakdown of the spatial extent and type of clearing of mapped threatened ecological communities and threatened flora
- Live animal sightings, captures, any releases or injured/shocked wildlife
- Details of any habitat features removed and retained i.e. HBT -size/ class/ details of number of hollows
- The Location, date and time of fauna capture and release, or treatment as per the fauna handling procedure
- Fauna that may have died as a result of clearing
- Photographs of any rescued fauna.
- Connectivity corridor performance being maintained, if applicable.
- Monitoring locations confirmed during pre-clearance surveys

Reports will be prepared by the Project Ecologist and provided to Transgrid within 3 months of completion of clearing for a given area. Reports will be provided to CPHR and may be provided to other agencies upon request and at Transgrid's discretion.

As detailed in the Section 7.5 of the BMP, the spatial extent and type of clearing will be provided to Transgrid to confirm actual impacts to biodiversity values to inform any final biodiversity offset requirements within the biodiversity offset package allowing comparison to clearing limits in Appendix 2 of the Planning Approval per CoA B25.

Actual clearing extents will be recorded and provided to Transgrid in GIS format:

- The clearing extent
- The type of clearing at each clearing location as per the clearing approach identified and assessed in the EIS and Revised BDAR.

6. UNEXPECTED THREATENED SPECIES FINDS PROCEDURE

If during construction activities the Project Ecologist (or other Project personnel) identify a threatened species or threatened ecological community that has not been (or is suspected to have not been) assessed as a part of the Project assessment, the Unexpected Threatened Species Finds Procedure (Appendix A) will be followed.

This includes a commitment that any newly detected threatened species or their habitats will be identified, photographed, mapped and reported in pre-clearing reports to inform design, micro-siting, specific avoidance (particularly if owl breeding habitat or SAI species) and appropriate mitigation measures subject to monitoring and reporting.

APPENDIX C: FAUNA HANDLING AND RESCUE PROCEDURES

HumeLink East



Fauna Handling and Rescue Procedure

HLE-AGJ-ENV-ALE-PRD-0000-00006 | Rev 02

I. APPROVALS

	Name	Signature	Date
Author:	[REDACTED]	[REDACTED]	21/07/2025
Sponsor:	[REDACTED]	[REDACTED]	21/07/2025
Project Director:	[REDACTED]	[REDACTED]	21/07/2025

The authorised use of this document shall only be once approved by way of presence of signatories under section above.

II. DOCUMENT CONTROL – REVISION HISTORY

Rev	Date	Pages	Revised by	Description
A	16/01/2024	All	[REDACTED]	For submission to Transgrid
B	3/04/2024	All	[REDACTED]	For submission to Transgrid
C	15/07/2024	All	[REDACTED]	Updated for Amendment Report and Revised BDAR. For submission to Transgrid
D	14/08/2024	All	[REDACTED]	Update to address Transgrid comments
00	19/08/2024	Nil		IFU
01.1	29/11/2024	All	[REDACTED]	Updated for Revised BDAR (Rev 00), CoA and to address Transgrid Additional Ecological Surveys Briefing Note and BCS Comments
01.2	17/03/2025	All	[REDACTED]	Updated to address BCS and ER comments.
01.3	6/06/2025	1, 6	[REDACTED]	Updated to address CPHR comments.
01.4	21/07/2025	1	[REDACTED]	Update to address CPHR comments
02	15/09/2025	Nil		Issued for Use

GENERAL REQUIREMENTS

The Project Director is responsible for the distribution of this Management Plan. The controlled master version of this document is available for distribution as appropriate and maintained on RIB | CX. All circulated hard copies of this document are deemed to be uncontrolled. The implementation of this Management Plan is under the authority of AG JV and the Project Director. All personnel employed on the Project will perform their duties in accordance with the requirements of this Management Plan, supporting management plans, and related procedures.

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1. INTRODUCTION

This Fauna Handling and Rescue Procedure (Procedure) is an appendix to the Biodiversity Management Sub-plan (BMP) which forms part of the Construction Environmental Management Plan (CEMP) for the HumeLink East Project (the Project). Acciona Genus Joint Venture (AG JV) has been contracted to deliver the Project. Refer to the Biodiversity Management Plan (BMP) for the glossary, references and compliance against relevant Conditions of Approval (CoA) and Updated Management Measures (UMMs).

1.1 PURPOSE

This Procedure applies to the handling of any fauna encountered during construction if required in accordance with UMM B3 and CoA B30.

This Procedure has been prepared by Principal Ecologist [REDACTED] (Zoology & Entomology), Hons (Zoology), PhD (Ecology) and [REDACTED] (Biology), Grad. Dip. (Bushfire Protection).

1.2 SCOPE

This Procedure applies to the following:

- All activities conducted by site personnel (including subcontractors) that have the potential to encounter fauna that will need to be relocated or removed from site
- Vegetation clearing and land disturbance.

Handling of fauna may be necessary for fauna to be relocated or, if injured, taken to a vet or wildlife carer. A wildlife licence and/or scientific licence must be held by any staff handling fauna and should be undertaken either by the Project Ecologist or a person skilled in handling the species of fauna encountered.

Should any threatened species be identified that have not been assessed in the BDAR, the Unexpected Threatened Species Finds Procedure (Appendix A) would be implemented.

1.3 INDUCTION AND TRAINING

All Project personnel are to be inducted on the existence of this Procedure during the Project Induction and in more detail as required in Site Inductions and regular Toolbox Talks. Records of all training, including inductions, will be maintained. Records will include the name and role of the attendee, the date of training/induction as well as the name of the course.

1.4 ROLES AND RESPONSABILITIES

The Project Team's organisational structure and overall roles and responsibilities are outlined in Section 3.5 of the CEMP. Specific responsibilities for the implementation of environmental controls are detailed in Table 33 of the BMP.

1.5 PERMITS AND LICENCES

A Scientific Licence under Part 2 of the BC Act (including Animal Ethics Approval under the Animal Research Act 1985) is required for fauna handling/rescue and survey work. Where rescued fauna requires rehabilitation and care, only wildlife rehabilitation organisations authorised under Part 2 of the BC Act may be used. A wildlife licence and/or scientific licence must be held by any staff handling fauna.

2. GENERAL FAUNA HANDLING AND RESCUE PROCEDURE

This procedure will be implemented only if intervention is necessary (i.e. where fauna are injured or otherwise unable to leave the site without intervention), or to minimise stress to native fauna and/ or remove the risk of further injury.

Fauna may be encountered in a variety of situations during delivery of the Project. During staged clearing activities, any fauna handling will be carried out by the Project Ecologist or a trained fauna handler. During other construction activities or non-staged clearing (when the Project Ecologist or fauna handler may not be present on site), fauna may require handling by other Project personnel. Wherever possible, the Project Ecologist or trained fauna handler will be used. Due to the remoteness and large distances between work sites, there may be times when the Project Ecologist or fauna handler is not present on-site, and it is more important to move the fauna from danger or harm. In these circumstances, AG JV personnel may be required to handle the fauna (i.e. where that movement removes the fauna from danger or harm). Appropriate animal handling gear, as described below and in Section 3, should be kept at the site offices.

If wildlife (including aquatic) is discovered on the Project site during construction activities that may harm the animal or pose a risk to site personnel, the following steps will be taken:

1. Stop all work in the vicinity of the fauna, turn off all machinery, and immediately notify the Foreman who is then to notify the Environment and Sustainability Manager. The Environment and Sustainability Manager is then to immediately notify the Project Ecologist to discuss the best course of action, e.g. if animal is injured then take to wildlife rescue organisation or closest Veterinary Clinic
2. Preferably allow fauna to leave the area without intervention if it is not injured or in shock and if safe to do so (i.e. no machinery in the immediate vicinity). In the event the Project Ecologist or local wildlife rescue cannot be contacted, the injured animal will be delivered to the closest vet as soon as possible. The contact details for available vets and WIRES are provided within Table 1
3. Where necessary, to minimise stress to native fauna and/ or remove the risk of further injury before the appropriate rescue agency arrives onsite, AG Environmental Personnel shall:
 - a. Cover the animal with a towel or blanket and place in a cardboard box and/or hessian bag. Appropriate temporary housing for fauna is species-dependent. Gliders, possums, bats, snakes, lizards and frogs can be held individually in a calico bag until released in adjacent habitat. Nesting birds and eggs are best placed in a covered cardboard box equipped with soft cloth
 - b. Place small animals in a cotton bag, tied at the top
 - c. Rescued fauna must be protected from exposure to heat and removed from the areas undergoing clearing activities to minimise noise exposure. Keep the animal in a quiet, cool, ventilated and dark place. A designated site would be decided upon in advance of any construction work
 - d. Aquatic fauna to be placed in a plastic aquarium or plastic bag with sufficient amount of water sourced from point of collection. Frogs would be transported without water or debris in recognition of the risk of transporting disease and the minimal transport time. Any frog handling would be undertaken in accordance with the Hygiene Guidelines (DPIE, 2020) (see Section 3.6)
 - e. Some animals require particular handling (e.g. venomous reptiles, raptors) and should only be handled by appropriately qualified personnel
 - f. If handling bats, the handler must be vaccinated against the Australian Bat Lyssavirus (ABLV), which is a form of rabies and have appropriate licences to handle
 - g. Equipment for fauna rescue (including but not limited to a hessian sack, calico bags, cloths/ towels, gloves and transport boxes) will be kept in designated locations for emergency use by site staff if required. The fauna specialist will carry a fauna rescue kit in a site vehicle, and an additional kit will be located in the site office
 - h. Ensure a fully equipped standard first aid kit is on their person at all times, which should include a minimum of two snake bandages. Any animal handling must be undertaken by, or under the supervision of, a person with first-aid training

4. If the animal cannot be handled but appears to be injured or in shock and has not moved on of its own accord, exclude personnel from the vicinity, record the exact location of the animal and contact the Project Ecologist and/ or rescue agency
5. If the animal cannot be handled but appears to be injured or in shock and has not moved on of its own accord, exclude personnel from the vicinity, record the exact location of the animal and contact the Project Ecologist and/ or rescue agency
6. If the fauna species is identified as a threatened species that is not a species identified in the BDAR, the Environment and Sustainability Manager must:
 - a. Immediately cease all work likely to affect the threatened species
 - b. If the fauna is injured, call the rescue agency and notify Project Ecologist
 - c. Implement the Unexpected Threatened Species Finds Procedure (Appendix A of the BMP)
7. If the fauna is to be released, the Project Ecologist must identify suitable fauna release locations within or near the Project site

All relevant Project documentation will be updated to display the new findings and subsequent management measures where required. This would include the BMP (and associated documents) and Environmental Control Maps (Appendix E of the CEMP).

Due to the linear nature of the Project, there will be a range of different roads and access tracks in which Project personnel or subcontractors may encounter fauna. The likelihood of encountering fauna during dawn and dusk is increased.

If fauna are handled, moved or euthanised during clearing activities, this will be recorded in post-clearing reports. If fauna are struck by a vehicle, this is recorded by the Environment team via the Fauna Incident Reporting Protocol (Section 6) and requires reporting via the incident management database per the Safety Management Plan. A Fauna Strike, Injury or Mortality Register will be maintained during construction.

3. SPECIFIC HANDLING REQUIREMENTS

3.1 BIRDS

General rescue approach for birds:

- where possible and safe to do so, gain access to nests and relocate to nearby safe areas avoiding the direct handling of eggs and chicks where possible. Nest platforms/poles will be considered on a case-by-case basis where they provide benefit to a threatened species and as advised by an ecologist
- capture and remove any nestlings
- place nestlings in cotton capture bags and assess for injuries. Store bags containing nestlings in a pet-carrying cage or ventilated cardboard box. The animal container will be covered to reduce stress on the bird. Deliver to specialist wildlife carer
- if adult birds are captured, they will be released away from construction activities
- raptors should only be handled by experienced fauna handlers and with appropriate attire e.g. welders' gloves for the talons.

3.2 SMALL GROUND-DWELLING MAMMALS

General rescue approach for ground dwelling mammals:

- if a small mammal is within the construction zone, activities in the area that may impact the animal may need to cease
- small mammals should be calmly encouraged or left to leave the work area
- if small mammals are found during habitat removal, they will need to be captured and relocated
- if an echidna is found, dig it out by hand or carefully by shovel to the side of the echidna. The aim is to get a hand(s) beneath the animal and to lift it from the soil. Ensure thick gloves are used if handling
- if native rodents or bandicoots are found, capture using your hands or with a net and place in a cloth bag
- place small mammals in a larger container, such as a pet carry case. Captive mammals will be kept in a cool, well-ventilated location, out of direct sun. Uninjured small mammals will be translocated to adjacent un-impacted bushland and released as soon as possible

3.3 LARGE GROUND-DWELLING MAMMALS

General rescue approach for kangaroos, wallabies, wombats and introduced pests:

- if a large mammal is within the construction zone, activities in the area that may impact the animal may need to cease
- large mammals should be calmly encouraged, or left, to leave the work area
- in the event that a juvenile is displaced (thrown from a pouch) and cannot be reunited with its parent, it will be taken to a vet or wildlife carer
- gloves should be worn at all times when handling mammals to mitigate risks from kicking and scratching
- introduced pests such as goats, deer and pigs should not be handled. All pest species should be corralled/ directed out of the Project or dealt with in accordance with the Biosecurity Management Plan

3.4 ARBOREAL MAMMALS

General rescue approach for arboreal mammals:

- if arboreal mammals are found during vegetation clearing, the Project Ecologist/ fauna handler will determine if capture and relocation are warranted
- animals will be captured either by hand or net and placed into a suitable cage
- if uninjured, captured animals will be released at a location deemed suitable by the Project Ecologist
- in the event that juvenile possums/ gliders are displaced and cannot be reunited with their mother, they will be managed in accordance with the recommendations of the Project Ecologist or fauna handler. As required, the juvenile will be taken to a vet or wildlife carer

3.5 REPTILES

General rescue approach for reptiles:

- snakes will only be captured and relocated if they present a potential threat to construction personnel or are likely to be harmed by the works. In most cases, snakes will attempt to move away from a disturbed area
- reptiles will be captured by the Project Ecologist (when they are available) or by a person who is licensed under the Biodiversity Conservation Act 2016 to catch and release reptiles
- no contact handling techniques (i.e. use a snake hook and bag as opposed to manually handling the snake) are recommended for all snakes
- lizards will be released as soon as possible after capture into suitable habitat outside of the construction zone

3.6 AMPHIBIANS

The Hygiene Guidelines (DPIE, 2020) must be followed for all frog handling to prevent pathogen spread amongst individuals and between catchments. General rescue approach for frogs:

- single use, non-latex, non-powdered (i.e. nitrile) disposable gloves to be worn when handling individuals if gloves are not available, then avoid touching the frog with bare hands by using implements to transfer to a container
- healthy frogs are to be placed in separate single-use plastic bags which should be partially inflated and include a small amount of leaf litter or clean (i.e. washed in a 0.1% concentration of a benzalkonium chloride-based disinfectant solution such as F10SC at 1:250 dilution and not re-used) damp cloth bag containing a small amount of leaf litter
- sick or injured individuals would be euthanised immediately unless there is a high probability of recovery, in which case treatment would be as for healthy frogs
- handling equipment, hands and boots to be cleaned of all soil and sprayed with a 0.1% concentration of a benzalkonium chloride-based disinfectant solution (i.e. F10SC at 1:250 dilution) or a Chlorhexidine based product (e.g. Halamid©) and rinsed when moving between waterbodies. Hands may be disinfected using 70% methylated spirits in water
- frogs and tadpoles are not to be moved between catchments
- dead frogs would be handled only using single-use gloves and buried in situ to avoid movement of pathogens

3.7 OTHER MAMMALS: BATS

General rescue approach for bats:

- bats must only be handled by a qualified ecologist or wildlife carer experienced in bat handling and vaccinated against the Australian Bat Lyssavirus (ABLV)
- gloves must be worn when handling bats
- as soon as possible, captured microbats will be placed into a cloth bag hung vertically in a quiet, cool, dark place until released
- larger bats would be wrapped in a large towel and handled by wearing elbow length puncture proof gloves
- all bats will be relocated into adjacent suitable habitat
- in the event that a juvenile bat is displaced and cannot be reunited with its parent, orphaned animals will be managed in accordance with the recommendations of the Project Ecologist or fauna handler. As required the juvenile will be taken to a vet or wildlife carer

4. EUTHANASIA

4.1 WHEN TO EUTHANISE

In some cases, rehabilitation and/ or relocation of fauna will not be possible. When it is not possible to transport an injured animal to a wildlife carer or veterinarian (e.g. when injuries are so extreme that survival is not possible), injured fauna must be assessed by the Project Ecologist or AG ER and a decision made regarding euthanasia. In keeping with the NSW Code of Practice for Injured, Sick and Orphaned Protected Fauna (Office of Environment and Heritage, 2011), fauna must be euthanised without exception when:

- death is imminent or highly likely regardless of the treatment provided
- the animal is suffering from chronic, un-relievable pain or distress
- the animal is carrying (or suspected to be carrying) an incurable disease that may pose a health risk to wild animals
- its ability to consume food unaided is permanently impaired due to a missing or injured jaw, teeth or beak

Fauna must be euthanised when one or more of the following circumstances apply:

- its ability to locomote normally (i.e. run, climb, crawl, hop, fly or swim) is permanently impaired due to a missing or injured limb, wing, foot, backbone or tail
- its ability to sense its environment (i.e. see, hear, smell, taste or feel) is permanently impaired due to a missing or injured organ (e.g. eye, ear or nose)
- its ability to catch or handle food is permanently impaired.

4.2 EUTHANASIA METHODS

A method appropriate for the species and circumstances should be utilised to ensure minimal pain and suffering. These methods could include:

- stunning followed by decapitation and/or destruction of the brain for reptiles and amphibians
- stunning followed by cervical dislocation for small birds and mammals (less than 0.5 kg)

Any euthanasia methods utilised will be in accordance with those identified in the NSW Code of Practice for Injured, Sick and Orphaned Protected Fauna (Office of Environment and Heritage, 2011).

Fauna that requires euthanasia should not be exposed to additional stressors such as large numbers of onlookers, people touching it, loud noises or extreme temperatures.

Death must be confirmed prior to disposal of the carcass. The absence of a heartbeat and the loss of corneal reflexes indicate death has occurred.

The decision to euthanise an animal can only be made by the Project Ecologist and/or fauna handler. Euthanasia should be carried out by a licenced wildlife carer, veterinarian or Project Ecologist.

5. CONTACT DETAILS

The contact details for available vets and WIRES are provided within Table 1.

Table 1. Contact details.

Role	Organisation	Location	Contact details

6. FAUNA INCIDENT REPORTING PROTOCOL

If fauna are struck by a vehicle, the Fauna Handling Record Sheet (Table 2) is to be completed and provided to the Environment and Sustainability Manager, filed in the Environmental Log and included in the Fauna Strike, Injury or Mortality Register.

Table 2. Fauna handling record sheet.

Item	Detail
Date fauna located	
Time fauna located	
Weather (temperature, wind, cloud cover, precipitation)	
Location (Coordinates and description i.e. in tree hollow; under stockpile, open area etc)	
Fauna type (Mammal, bird, reptile etc)	
Species (if known)	
Visual signs of behaviour	
Condition, general health signs, description of injuries, note if a dead specimen	
Is the fauna injured (YES / NO)	
If YES, please complete Section A; If NO please complete Section B	
A – Injured Fauna Reporting	
What time was a fauna specialist (qualified ecologist or wildlife handler) called	
What time did the fauna specialist arrive?	
Fauna specialist name and contact	
What was the outcome? (e.g. Animal euthanised; animal in care; animal taken to vet; treated and relocated)	
B – Non-injured Fauna Reporting	
Where was the fauna relocated? (Coordinates and description) NB Only a qualified fauna ecologist or wildlife handler is to relocate fauna	
Time the fauna relocated?	
Name and qualification of fauna handler	
Visual signs of behaviour on release	
Condition – general health signs – on release	
General	
Other comments	
Completed by	
Signed	
Date	

APPENDIX D: BIOSECURITY MANAGEMENT PLAN

HumeLink East



Biosecurity Management Plan

HLE-AGJ-ENV-ALE-PLN-0000-00003 | Rev 02

I. APPROVALS

	Name	Signature	Date
Author:	[REDACTED]	[REDACTED]	22/07/2025
Sponsor:	[REDACTED]	[REDACTED]	22/07/2025
Project Director:	[REDACTED]	[REDACTED]	22/07/2025

The authorised use of this document shall only be once approved by way of presence of signatories under section above.

II. DOCUMENT CONTROL – REVISION HISTORY

Rev	Date	Pages	Revised by	Description
A	16/01/2024	All	[REDACTED]	For submission to Transgrid
B	3/04/2024	All	[REDACTED]	For submission to Transgrid
C	15/07/2024	All	[REDACTED]	For submission to Transgrid
D	14/08/2024	All	[REDACTED]	Update to address Transgrid comments
00	19/08/2024	Nil		IFU
01.1	29/11/2024	All	[REDACTED]	Updated for Revised BDAR (Rev 00), CoA and to address Transgrid Additional Ecological Surveys Briefing Note and BCS Comments
01.2	17/03/2025	All	[REDACTED]	Updated to address BCS and ER comments.
01.3	6/06/2025	All	[REDACTED]	Updated to address CPHR comments.
01.4	22/07/2025	11	[REDACTED]	Updated to address CPHR comments
02	15/09/2025	Nil		Issued for Use

GENERAL REQUIREMENTS

The Project Director is responsible for the distribution of this Management Plan. The controlled master version of this document is available for distribution as appropriate and maintained on RIB | CX. All circulated hard copies of this document are deemed to be uncontrolled. The implementation of this Management Plan is under the authority of AGJV and the Project Director. All personnel employed on the Project will perform their duties in accordance with the requirements of this Management Plan, supporting management plans, and related procedures.

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1. INTRODUCTION

This Biosecurity Management Plan (Plan) is an appendix to the Biodiversity Management Sub-plan (BMP) which forms part of the Construction Environmental Management Plan (CEMP) for the HumeLink East Project (the Project). Acciona Genus Joint Venture (AG JV) has been contracted to deliver the Project. Refer to the Biodiversity Management Plan (BMP for the glossary, references & compliance against relevant Conditions of Approval (CoA) and Updated Management Measures (UMMs).

1.1 PURPOSE

This Plan details the weed and pathogen management and control practices to be implemented throughout the construction phase of the Project, to minimise the threat to native fauna, remnant vegetation within the Project site, other remnant vegetation in the local area and agricultural activities in accordance with UMM B3 and B22 and CoA B30.

This Plan has been prepared by Principal Ecologist Dr J [REDACTED] (Zoology & Entomology), Hons (Zoology), PhD (Ecology) and [REDACTED] (Biology), Grad. Dip. (Bushfire Protection).

1.2 SCOPE

This Plan focuses on weed and pathogen control prior to vegetation clearance, weed, pathogen and pest management and control during clearing and progressive weed control throughout the construction phase.

All monitoring and associated reporting required for this Plan will be undertaken in accordance with Appendix H Flora and Fauna Monitoring Program.

1.3 INDUCTION AND TRAINING

All Project personnel are to be inducted on the existence of this Procedure during the Project Induction and in more detail as required in Site Inductions and regular Toolbox Talks. All personnel managing and using pesticides will receive appropriate training prior to commencing work. Records of all training, including inductions, will be maintained. Records will include the name and role of the attendee, the date of training/induction as well as the name of the course.

1.4 ROLES AND RESPONSABILITIES

The Project Team's organisational structure and overall roles and responsibilities are outlined in Section 3.5 of the CEMP. Specific responsibilities for the implementation of environmental controls are detailed in Table 29 of the BMP.

1.5 RELEVANT DOCUMENTS, GUIDELINES AND SPECIFICATIONS

This Plan has been prepared in accordance with the requirements of the *Biosecurity Act 2015* (NSW), Hygiene protocols for the control of diseases in Australian frogs (DCCEEW, 2011) and with consideration to the guidelines detailed within Table 1.

Table 1. Relevant guidelines.

Guideline/ Strategy	Application
National Weeds Strategy 2017-2027	These weeds are regarded as a current priority and future weed threat to Australia because of their invasiveness, potential for spread, and economic and environmental impacts. Five WoNS and 21 priority weeds were identified in the Project area.
NSW Invasive Species Plan 2018-2021 (DPI, 2018a).	The plan adopts four goals for managing invasive species (including weeds): 1. Exclude – prevent the establishment of new invasive species 2. Eradicate or contain – eliminate or prevent the spread of new invasive species 3. Effectively manage – reduce the impacts of widespread invasive species 4. Capacity building – ensure NSW has the ability and commitment to manage invasive species

Guideline/ Strategy	Application
	This plan will aim to align with the relevant first three main goals of preventing the establishment of new invasive species and containing invasive species in areas directly impacted by construction as outlined in Sections 3 and 4 of this Plan.
Priority Weeds of the Murray and Riverina Regions - Identification Guide.	The guide has been developed as an easy-to-use resource to assist land managers and members of the general community to identify high priority weeds. It is not intended to provide detailed information on each species and their control. Notification details are also provided within the guide for the identified priority weeds.
Riverina Regional Strategic Pest Animal Management Plan 2018 – 2023 (LLS, 2018)	The overall goal of the plan is to: • Reduce the impacts of pest animals within the Riverina region on production, the environment and the community • Improve community engagement and expertise in pest animal management • Improve monitoring and reporting of pest animal management activities
South East Regional Strategic Weed Management Plan 2023-2027 (LLS, 2022)	The plan applies to all lands and waters in the South East region and focuses on managing weeds that impact: • animal and plant industries, including agriculture, horticulture, forestry, aquaculture, and recreational fishing in freshwater systems and eco-tourism • ecological communities and biodiversity, including those in natural urban and peri-urban environments • human health, livelihood, lifestyle, cultural values, recreation, and landscape amenity • infrastructure and service industries, including energy, transport, and water supplies
South East Regional Strategic Pest Animal Plan 2018-2023 (LLS, 2018)	Key outcomes of this plan include: • Outcome 1: The South East RSPAMP is effective in supporting the community to reduce pest animal impacts • Outcome 2: The South East community shares the responsibility for pest animal management • Outcome 3: The impact of priority pest animals on priority assets is reduced, and their spread contained • Outcome 4: New pest species in the region are detected and incursions are eradicated

1.6 TRANSGRID GENERAL BIOSECURITY REQUIREMENTS

This Plan is to be implemented in conjunction with Transgrid's Corporate-wide Biosecurity Procedure (2022), which provides further detail on general work planning. Ensuring individuals and their vehicles are not carrying any unwanted pests, diseases and weeds is an effective way of minimising the risk. Individuals can ensure that they 'come clean, go clean' (as far as reasonably practicable) by:

- Inspecting vehicles for soil/vegetation matter (and having an awareness of where a vehicle might harbour these, like wheel wells, undercarriage, radiator and behind the bulbar)
- Thoroughly washing vehicles periodically. Where possible, before entering a property, wash down, brush down or utilise the Biosecurity Kit
- Scrub and wash down boots before entering or leaving the property and production areas
- Ensure all tools and equipment have been properly cleaned and not carrying any unwanted passengers

1.6.1 EMERGENCY ZONE

When a significant outbreak of disease or pest has been identified in an area that has an impact on the economy, environment or community it will be declared an emergency zone by either the federal, state or local government under the *Biosecurity Act 2015*. An emergency zone will have conditions in place to contain the further spread of disease. The strictness of the emergency order conditions will depend on the severity and type of outbreak or pest and the potential threat to non-infected areas.

Notification of an emergency zone declaration will be made by the Senior Environment & Sustainability Manager to staff through an HSE Notice.

1.6.2 CONTROL ZONE

A control zone is declared to eradicate or prevent the spread of medium or high-risk biosecurity matter, and it is not intended to serve as a long-term management tool. A control zone can be made quickly so that a timely response can be mounted to a biosecurity risk or impact that is not deemed an emergency, or as an immediate response while longer-term management arrangements are being developed.

1.6.3 BIOSECURITY ZONE

A Biosecurity zone has specific controls and requirements that must be implemented to prevent, eliminate, minimise or manage a biosecurity risk or biosecurity impact. Of the ten biosecurity zones listed in the *Biosecurity Regulation 2017*, there are currently three biosecurity zones relevant to Transgrid's activities that are in place to manage high-priority weeds. These are:

- Alligator weed (all of NSW)
- Bitou bush (all land within the State except land within 10 kilometres of the mean high water mark of the Pacific Ocean between Cape Byron in the north and Point Perpendicular in the south.)
- Water hyacinth (all land within the State, except for the following regions: Greater Sydney or North Coast, North West (but only the local government area of Moree Plains), Hunter (but only in the local government areas of City of Cessnock, City of Lake Macquarie, MidCoast, City of Maitland, City of Newcastle or Port Stephens), South East (but only in the local government areas of Eurobodalla, Kiama, City of Shellharbour, City of Shoalhaven or City of Wollongong).)

1.6.4 BIOSECURITY RISK ZONES

For the purposes of planning works including access and inspection, properties will be assigned a biosecurity risk rating based on an assessment of the degree of risk known to be present (if any) (Table 2). Risk zones will be included and managed in the Project GIS.

Table 2. *Biosecurity Risk Rating (Transgrid, 2022).*

Risk rating	Examples
High	Properties subject to a control order, quarantined properties and known properties that have in place a Biosecurity Management Plan or where a land occupier has notified Transgrid of a valid biosecurity concern.
Medium	Intensive animal production properties and other at-risk land-use classifications, known as weed-infested properties.
Low	All other properties. No known risk, but, as always, the potential exists, and access should be undertaken with caution.

2. EXISTING ENVIRONMENT

The following section summarises existing known weeds, pathogen species and pest animals within and adjacent to the Project based on the information contained in Technical Paper 4 (Agricultural land impact assessment) of the EIS, and the Revised BDAR. The assessment comprised of an agricultural study area which includes the project footprint with a 1.5-kilometre buffer and encompasses the agricultural areas likely to be directly and indirectly affected by the Project.

2.1 WEEDS

The Project has the potential to effectively manage biosecurity risks due to its separation from major populations and intensive agricultural industries.

High Threat Weeds (HTW), Priority weeds (Riverina, Murray and Southeastern regions) under the NSW Biosecurity Act 2015 (DPI 2023) and Weeds of National Significance (WoNS) (Australian Weeds Committee, 2018) recorded within the Project footprint are detailed in Table 3. It is noted that there is no statutory requirement to manage HTWs and as such, they are not discussed further.

Table 3. Priority weeds recorded during field surveys for the BDAR.

Scientific Name (Common Name)	Priority	WoNS	HTW	IBRA Subregion
<i>Agrostis capillaris</i> (Browntop Bent)	-	No	Yes	Crookwell, Murrumbateman
<i>Axonopus fissifolius</i> (Narrow-leaved Carpet Grass)	-	No	Yes	Bungonia, Crookwell, Murrumbateman
<i>Bidens pilosa</i> (Cobbler's Pegs)	-	No	Yes	Bungonia,
<i>Briza subaristata</i>	-	No	Yes	Crookwell, Murrumbateman
<i>Bromus diandrus</i> (Great Brome)	-	No	Yes	Crookwell, Murrumbateman, Inland Slopes
<i>Carthamus lanatus</i> (Saffron Thistle)	-	No	Yes	Bungonia, Crookwell, Murrumbateman, Inland Slopes, Bondo
<i>Cenchrus ciliaris</i> (Buffel Grass)	-	No	Yes	Inland Slopes
<i>Cenchrus clandestinus</i> (Kikuyu)	-	No	Yes	Inland Slopes
<i>Crataegus monogyna</i> (Hawthorn)	-	No	Yes	Bungonia, Crookwell,
<i>Cyperus eragrostis</i> (Umbrella Sedge)	-	No	Yes	Bungonia, Crookwell, Murrumbateman, Inland Slopes
<i>Delairea odorata</i> (Cape Ivy)	-	No	Yes	Bondo
<i>Ehrharta calycina</i> (Perennial Veldtgrass)	-	No	Yes	Inland Slopes
<i>Ehrharta erecta</i> (Panic Veldtgrass)	-	No	Yes	Bungonia, Inland Slopes, Bondo
<i>Eragrostis curvula</i> (African Lovegrass)	-	No	Yes	Murrumbateman, Inland Slopes, Bondo
<i>Hypericum perforatum</i> (St. John's Wort)	-	No	Yes	Crookwell, Murrumbateman, Inland Slopes, Bondo
<i>Ligustrum sinense</i> (Small-leaved Privet)	-	No	Yes	Bondo
<i>Nassella neesiana</i> (Chilean Needle Grass)	Yes	Yes	Yes	Crookwell, Murrumbateman, Inland Slopes
<i>Nassella trichotoma</i> (Serrated Tussock)	Yes	Yes	Yes	Bungonia, Crookwell, Murrumbateman,
<i>Paspalum dilatatum</i> (Paspalum)	-	No	Yes	Bungonia, Crookwell, Murrumbateman, Inland Slopes
<i>Pinus radiata</i> (Radiata Pine)	-	No	Yes	Inland Slopes, Bondo

Scientific Name (Common Name)	Priority	WoNS	HTW	IBRA Subregion
<i>Rosa rubiginosa</i> (Sweet Briar)	-	No	Yes	Bungonia, Crookwell, Murrumbateman, Inland Slopes, Bondo
<i>Rubus fruticosus</i> sp. agg. (Blackberry complex)	Yes	Yes	Yes	Bungonia, Crookwell, Murrumbateman, Inland Slopes, Bondo
<i>Rumex acetosella</i> (Sheep Sorrel)	-	No	Yes	Bungonia, Crookwell, Murrumbateman, Inland Slopes, Bondo
<i>Salix rubens</i>	Yes	Yes	Yes	Murrumbateman
<i>Senecio madagascariensis</i> (Fireweed)	Yes	Yes	Yes	Bungonia, Crookwell, Inland Slopes
<i>Xanthium occidentale</i> (Noogoora Burr)	-	No	Yes	Bungonia, Inland Slopes
<i>Xanthium strumarium</i>	-	No	Yes	Inland Slopes

2.2 OTHER WEEDS UNDER THE BIOSECURITY ACT 2015

The EIS Technical Paper 4 (Agricultural Land Impact Assessment) reported weeds recorded by authorised officers during property inspections under the *Biosecurity Act 2015*. The most common weed recorded by authorised officers during property inspections under the *Biosecurity Act 2015* was Blackberry (*Rubus fruticosus*), which was found in relatively high numbers across the agricultural study area. Other common weeds with more restricted geographical spread are set out in Table 4. Images of these recorded weeds are provided in Table 12 of this plan.

Table 4. Common weeds in the agricultural study area.

Species	
Between Tumut and Bookham	
St. Barnaby's Thistle	<i>Centaurea solstitialis</i>
Serrated Tussock	<i>Nassella trichotoma</i>
Sweet Briar	<i>Rosa rubiginosa</i>
Between Bookham and Dalton	
African Lovegrass	<i>Eragrostis curvula</i>
St John's Wort	<i>Hypericum perforatum</i>
Sweet Briar	<i>Rosa rubiginosa</i>
Between Dalton and Bannaby	
Serrated Tussock	<i>Nassella trichotoma</i>

2.3 REGIONAL PRIORITY WEEDS

The regional strategic weed management plans (Riverina LLS, 2017 and South East LLS, 2017) identify regional priority weeds, some of which are, or may, be present in the vicinity of the agricultural study area according to weed distribution data (Table 5).

Table 5. Regional priority weeds.

Species	
African Lovegrass	<i>Eragrostis curvula</i>
Black Willow	<i>Salix nigra</i>
Bitou Bush	<i>Chrysanthemoides monilifera</i> ssp. <i>rotundata</i>
Cane Needle Grass	<i>Nassella hyalina</i>
Cat's Claw Creeper	<i>Dolichandra unguiscati</i>

Species	
Chilean Needle Grass	<i>Nassella neesiana</i>
Coolatai Grass	<i>Hyparrhenia hirta</i>
Fireweed	<i>Senecio madagascariensis</i>
Gorse	<i>Ulex europaeus</i>
Grey Sallow	<i>Salix cinerea</i>
Groundsel Bush	<i>Baccharis halimifolia</i>
Lantana	<i>Lantana camara</i>
Montpellier Broom	<i>Genista monspessulana</i>
Mother of Millions	<i>Bryophyllum spp</i>
Ox-eye Daisy	<i>Leucanthemum vulgare</i>
Perennial Ground Cherry	<i>Physalis longifolia</i>
Pink Pampas Grass	<i>Cortaderia jubata</i>
Prairie Ground Cherry	<i>Physalis hederifolia</i>
Scotch Broom	<i>Cytisus scoparius</i>
Serrated Tussock	<i>Nassella trichotoma</i>
Spanish Broom	<i>Spartium junceum</i>
Spanish Heath	<i>Erica lusitanica</i>
Tropical Soda Apple	<i>Solanum viarum</i>
Water Hyacinth	<i>Eichhornia crassipes</i>

2.4 STATE PRIORITY WEEDS

As outlined in EIS Technical Paper 4 (Agricultural land impact assessment), State priority weeds that may occur in the Riverina or South East LLS regions are presented in Table 6.

Table 6. State priority weeds.

Species	
African Boxthorn	<i>Lycium ferocissimum</i>
Asparagus Weeds	<i>Asparagus species</i>
Athel Pine	<i>Tamarix aphylla</i>
Boneseed	<i>Chrysanthemoides monilifera ssp. monilifera</i>
Cane Cactus	<i>Austrocylindropuntia cylindrica</i>
Lantana	<i>Lantana camara</i>
Prickly Pears	<i>Opuntia and Cylindropuntia species</i>
Bitou Bush	<i>Chrysanthemoides monilifera ssp. rotundata</i>
Blackberry	<i>Rubus fruticosus</i>
Silverleaf Nightshade	<i>Solanum elaeagnifolium</i>
Tropical Soda Apple	<i>Solanum viarum</i>
Water Hyacinth	<i>Eichhornia crassipes</i>
Willows	some <i>Salix</i> species

Some of the weeds listed above as state or regional priority weeds or weeds recorded by authorised officers are also 'weeds of national significance' (Weeds Australia, 2022), including Athel Pine (*Tamarix aphylla*), Bitou Bush (*Chrysanthemoides monilifera*), Blackberry (*Rubus fruticosus*), Bridal Creeper

(*Asparagus asparagoides*), Chilean Needle Grass (*Nassella neesiana*), Gorse (*Ulex europaeus*), Lantana (*Lantana camara*), Serrated Tussock (*Nassella trichotoma*) and Willows (some *Salix* species).

2.5 OTHER WEEDS IDENTIFIED IN THE EIS

Other important weeds in the Riverina and South East LLS regions are listed in the respective regional strategic weed management plans. The description of these weeds varies between the two relevant LLS regions, but they are described in South East LLS (2017) as species that pose a potential biosecurity risk within the region, but there is insufficient information on them to complete a regional risk assessment and inform an appropriate regional response. These weeds are listed in Table 12 of this plan.

Other weeds in the vicinity of the agricultural study area include khaki weed (*Alternanthera pungens*) and caltrops (*Tribulus terrestris*). Both are found in disturbed and high-traffic areas such as roadways and are easily spread by vehicles and humans.

2.6 POTENTIAL ANIMAL AND PLANT DISEASES (PATHOGENS)

2.6.1 ANIMAL

The occurrence of sheep footrot in the vicinity of the agricultural study area has been low in recent years. DPI reported a total of 32 quarantined flocks in December 2021 across the Riverina and South East LLS regions (DPI, 2022). The total number of flocks across the Riverina and South East LLS regions was 5,440. Therefore, the infection rate was around 0.6 per cent.

Footrot is a contagious bacterial disease of sheep and goats, caused by the organism *Dichelobacter nodosus* (*D. nodosus*) in association with several other bacteria. The bacterium *D. nodosus* may persist for many years in the feet of infected sheep and may pass from infected sheep into the soil. Footrot is introduced into a clean flock by the inclusion of infected sheep, or by exposure to contaminated land under favourable conditions.

Little recent data is available on the prevalence of Ovine Johne's disease (OJD) in NSW. However, most of the agricultural study area was in a high prevalence area with more than 12.5 per cent of flocks estimated to be infected (DPI, 2011). OJD is an incurable infectious disease caused by the bacterium *Mycobacterium paratuberculosis*.

The landowners consulted confirmed that OJD is not a substantial problem as it is currently well-managed. There have been problems with footrot in recent years, but these cases are relatively rare.

No specific data is available on sheep lice infestations near the agricultural study area.

No evidence of Chytrid Fungus (*Batrachochytrium dendrobatidis*) was recorded within the Project footprint. However, there is the potential for this to occur.

2.6.2 PLANT

Horticultural enterprises are particularly susceptible to plant diseases and pests. All of the agricultural study area is within the Phyloxera Exclusion Zone. The entire state of NSW is a Potato Biosecurity Zone.

No evidence of pathogens such as Root Rot (*Phytophthora cinnamomi*) and Myrtle Rust (*Austropuccinia psidii*) was recorded within the Project footprint. However, these have the potential to occur.

Phytophthora has been detected in locations associated with the adjoining Snowy 2.0 project and in Lob's Hole (as identified in Appendix C (NSW DCCEE Environment and Heritage detailed response) of the HumeLink Submissions Report). Recent surveys of Kosciuszko National Park have detected three species that are likely to be the most destructive of environmental values:

- *Phytophthora cinnamomi*
- *Phytophthora gregata*
- *Phytophthora multivora*

The Project footprint does not overlap with Kosciuszko National Park and there are no plans for vehicle movements in the National Park. If construction vehicles are required to move through areas of known

or likely infestation, the risk of spread will be managed through the implementation of suitable hygiene protocols detailed in Section 4.

2.7 PEST ANIMAL SPECIES

The EIS Technical Paper 4 notes that foxes, wild rabbits and kangaroos have a widespread distribution across the agricultural study area (Riverina LLS, 2018 and South East LLS, 2018). Feral goats have scattered distribution with a low to medium presence near Tarcutta, low concentrations near Wagga Wagga and Burrinjuck Dam, and a higher abundance near Bannaby. Wild pigs are mainly found in low densities in the south near Tarcutta, Tumut, Maragle and Bookham, and around Dalton and Bannaby (DPI, 2021d).

The part of the agricultural study area between Tumut and Maragle has a medium to high abundance of feral horses and deer and a medium level of wild dogs. Wild dogs and deer are also found at the eastern end of the agricultural study area around Bannaby. The distribution of feral horses, feral pigs and deer has expanded in recent years in parts of the agricultural study area (DPI, 2021d).

Plague locusts and mice can also cause problems in favourable seasons. Some species (such as goats and pigs) pose important biosecurity, economic and social threats as they can harbour and transmit both endemic and exotic diseases.

2.8 BIOSECURITY ZONE

Currently, there are 4 biosecurity zones:

- Citrus Red Mite Biosecurity Zone
- Grapevine Phylloxera Biosecurity Zone
- Potato Biosecurity Zone
- Rice Biosecurity Zone

All of the agricultural study area is within the Phylloxera Exclusion Zone, which bans the taking of grapevines, cuttings or budwood into this zone. The agricultural study area is also in the Potato Biosecurity Zone, which covers all of NSW and restricts the movement of plants belonging to the family Solanaceae.

Biosecurity Zones will be monitored during construction with any updates to zones included in revisions to this Plan.

3. BIOSECURITY RISKS AND IMPACTS

There are risks that animal diseases, plant diseases, feral pests and especially weeds could be introduced or spread during the construction of the proposal through vegetation clearing, ground disturbance, soil and water movements and vehicle (especially tyres), machinery or construction personnel movements. Soil-borne biosecurity hazards could also be spread by soil erosion and water runoff associated with construction works.

A biosecurity breach of this nature is likely to increase costs and decrease the income of agricultural properties in the vicinity of the Project. Depending on the biosecurity matter, impacts on both costs and income could be short to long-term (more than five years). Increased costs could include expenses associated with monitoring pests, weeds or diseases and implementing control measures; while reduced income could include reduced livestock, crop or pasture production, plus lower quality of produce.

Weeds and pathogens pose a threat to threatened species and communities as they can affect the health of native plant and animal species, reducing their ability to reproduce or survive. Exotic fungal infections, viruses and other pathogens can weaken and kill native fauna species contributing to their decline and potential extinction. Weeds can compete with native plants for resources such as light, nutrients and space and aggressively invade areas and push out native species.

These risks are identified within the Environmental Risk Register within Appendix D of the CEMP.

3.1 RISK OF WEED SPREAD

The risk of weed spread is generally highest during the earthworks phase of construction, due to the high frequency of vehicle movements and disturbance of ground cover and soil, which could lead to weed growth. Weeds such as some cactuses, spiny burr grass, caltrops, khaki weed, Noogoora burr and Bathurst burr are readily spread by vehicles, machinery and human activity.

Biosecurity incidents (as defined in Section 5.6) have the potential to impact surrounding agricultural enterprises due to the costs of monitoring pests, weeds or diseases and implementing control measures as well as the reduced income caused by loss of livestock, crop or pasture production and lower produce quality.

To minimise the risk of biosecurity incidents occurring due to construction, mitigation measures would be implemented to avoid the spread of weeds.

3.2 RISK OF PATHOGENS

Sheep lice, OJD and ovine footrot are likely to be the most important livestock pest and disease risks associated with the Project. These sheep diseases are present in the region and can have large productivity impacts on sheep enterprises. There is the potential for several pathogens to be spread during the construction of the Project including:

- *Phytophthora spp.*
- Myrtle Rust (*Austropuccinia psidii*)
- Chytrid Fungus (*Batrachochytrium dendrobatidis*)
- Ovine footrot, which is an important risk despite its low current prevalence due to the relative ease of its spread and economic consequences due to impacts on stock health, productivity and value, as well as disease control costs
- Ovine Johne's Disease (OJD), which can result in significant economic losses due to sheep deaths, lost meat production, fewer lambs and less wool
- Sheep lice, which can cause significant losses in sheep enterprises due to treatment costs, reduced wool growth and lower meat production

Under the *Biosecurity Act 2015* Schedule 1, ovine footrot and OJD are notifiable diseases. However, considering the low density of livestock and low prevalence of disease in the area, the overall risk of spreading these livestock diseases during construction is low.

3.3 RISK OF OTHER PESTS

Pest animals threaten native animals because they hunt and prey on native species and compete for food and habitat resources. Pest animals also threaten native plant species and degrade the environment. Introduced herbivores, such as deer, goats and pigs, can cause extensive damage to native vegetation and soils through grazing, trampling and digging. They may also compete with native herbivores for food and further impact the environment by providing an abundant food source for other pests. For example, rabbits can support high densities of feral cats and foxes, which in turn prey on native animals. As well as damaging the natural environment, pest animals can harm sites of cultural significance such as Aboriginal rock art sites or historically significant structures.

Pest animals pose a major threat to agriculture by killing, harassing or competing with livestock, spreading disease and contributing to soil erosion. They can affect aquatic as well as terrestrial ecosystems. Species such as goats and pigs pose important biosecurity, economic and social threats as they can harbour and transmit both endemic and exotic diseases.

Guidance from the Department of Primary Industries on Varroa mites (*Varroa jacobsoni* and *V. destructor*) must be applied when relocating or managing bees and/ or beehives of honeybees.

The Biosecurity (Fire Ant) Emergency Order (No 3) 2024 places restrictions on the movement of fire ant carriers including organic mulch, compost, growing media, manure, soil and anything with soil on it, hay, straw, chaff, silage, potted plants, turf, agricultural equipment, earth moving equipment, sand, gravel, chitters, coal fines, coal stone, overburden and decomposed granite into NSW from the fire ant infested area of Queensland.

3.4 BIOSECURITY RISKS TO ORGANIC PRODUCERS

Organic producers face the same pest, weed and disease biosecurity risks as non-organic producers. However, there is an additional risk associated with the introduction of non-organic plants or materials to an organic property. These could include genetically modified plants, mineral fertilisers and synthetic pesticides. Construction activities are not expected to use or introduce genetically modified plants, and there are alternatives to the use of mineral fertilisers and synthetic pesticides. Therefore, the risk to organic producers would be very small with appropriate mitigation measures.

4. BASELINE DATA COLLECTION

The weed, pest and pathogen species known or likely to be present within the Project footprint are listed in Section 2 of this Plan. Additional baseline data is required to determine the spatial distribution of weed, pest and pathogen species across the Project and inform adaptive management measures and controls.

Baseline data will be obtained prior to commencement of vegetation clearing as part of pre-clearing surveys. Pre-clearing surveys will involve parallel field traverses within each pre-clearance area. The width of parallel traverses will depend on factors affecting line of sight, including vegetation formation, density and terrain. The spacing of field traverses will be determined at the time of survey by the attending ecologist, and will be appropriate to local conditions. Generally, the recommended spacing of parallel field traverses is 70 m wide or less. The distance between parallel field traverses will be recorded in the pre-clearing report.

The following methods for collecting baseline data relevant to weeds, pathogens and pests are to be undertaken during pre-clearing surveys:

- Identify priority weed species present
- Assign a cover estimate category (Low [$<5\%$], Moderate [$<15\%$], or High [$>15\%$]) for each priority weed species
- Record, photograph and mark any signs of pathogens (i.e., myrtle rust, tree dieback, sick or dead frogs) in the survey area
- Record, photograph and mark evidence of pests (e.g., alert species or priority species identified in Section 5.4 of this Plan) in the survey area
- Note the NSW property lot in which each weed species or evidence of pest or pathogen species are observed, to determine which property areas require management.

The full pre-clearing procedure for the Project is described in Appendix B Vegetation Clearing Procedure.

Where weed, pest and pathogen species are shown to be present, management measures will be undertaken in accordance with Section 5 of this Plan.

5. WEED, PATHOGEN AND PEST MANAGEMENT

The management of weeds is based on managing the risk of introducing new weeds, pathogens or pests to any Project work areas during the construction phase due to Project activities. Safeguards, hygiene protocols and management measures will be implemented to avoid and minimise the spread of pathogens (in line with Hygiene protocols for the control of diseases in Australian frogs (DCCEEW, 2011) and exotic weeds during construction and manage impacts from the introduction and spread of weeds. These are summarised in Table 11.

Clean-down bays will be established at designated points along the Project and at compounds. Clean-down bays will contain apparatus to clean vehicles, plant, equipment and footwear. The location of clean-down bays will be dependent on the biosecurity risks identified in that location and confirmed with the affected landholder in the Property Management Plans referred to in Section 5.5 below. Water from clean-down bays will drain to a contained sump/ low point and materials (sediments) from clean-down bays will be contained and disposed of in accordance with the Waste Management Plan (HLE-AGJ-MGT-ALE-PLN-0000-00032).

5.1 VEHICLE BIOSECURITY KIT

A vehicle biosecurity kit is an effective tool to help minimise the risk of spreading unwanted weeds, pests and diseases between farms or regions. A kit should be carried and used by persons operating at the farm level in agriculture and horticulture in NSW. This includes farmers, consultants, agronomists and trial operators, and farm/orchard staff, including itinerant workers and contractors. The kit is designed to reduce the biosecurity risk associated with people's movement on and off farms by assisting with personal cleanliness. Kit contents should include items for cleaning clothing, shoes, equipment and vehicle interiors.

The contents of a biosecurity kit will vary according to the agricultural/horticultural business. The basic contents of all kits should contain:

- Brush and pan
- Stiff brush for removing soil and plant matter from shoes, clothes, equipment and vehicle tyres
- Disposable gloves
- Handwash or hand sanitiser
- Spray bottle containing cleaning agent such as a detergent, dilute bleach solution or 70 % methylated spirits
- Paper towel
- Plastic bags for holding dirty clothes, shoes or equipment

Vials/containers and paper bags can be included for collecting samples of unusual pests and plant symptoms for further examination and identification. Factsheets on high-priority exotic threats for specific relevant industries can be included as a ready reference. Contact details for state agriculture departments for reporting suspect exotic pests and diseases can also be carried as a ready reference.

Additional suggested items include:

- Spare pair of shoes, for example for wearing while driving to keep vehicle interiors clean
- Overalls, particularly where activity may result in clothes becoming dirty or contaminated with pathogens (e.g. fungal spores)
- Disposable boot covers
- Magnifying glass to assist with identifying unusual pests or plant symptoms

A container of water (e.g. 5L) can also be carried to assist with cleaning. Vehicle exteriors are difficult to effectively clean using a biosecurity kit. On-farm vehicle movement should be minimised between properties, and farm vehicles used where available. Vehicle biosecurity kits should contain a stiff brush or scraper to remove weed seeds before leaving a site. Farm washdown facilities should be located to assist with ensuring vehicles are clean prior to leaving and entering farms.

5.2 WEED CONTROL

5.2.1 MECHANICAL CONTROL OF WEEDS

Mechanical control methods for weed management onsite include:

- Strategic use of seasonal slashing for select weed species in association with chemical application (slashing in spring, followed by chemical application to reduce seeding opportunities)
- Carry out mechanical means of control (such as mowing or slashing) where feasible in proximity to waterways and aquatic environments
- Clearing and grubbing

Weeds requiring hand or mechanical removal, including contaminated topsoil, will require disposal by encapsulation (deep burying) or disposal to an approved waste management facility. Machinery involved in weed management activities will be thoroughly cleaned to remove any plant material or soil, before the commencement of construction.

5.2.2 CHEMICAL CONTROL OF WEEDS

Chemical methods of weed control will be used during site rehabilitation in response to weed monitoring outcomes and recommendations.

- Timing of chemical application will vary depending on the lifecycle and periods of active growth for each weed species
- Herbicide application will be administered by authorised personnel only, with ChemCert Accreditation Australian Qualification Framework (AQF) 3 (in accordance with SafeWork NSW requirements)
- Herbicides and pesticides will be managed in ChemAlert
- Priority weeds will be treated using species-specific recommendations and herbicide dosages, as prescribed by the Department of Primary Industries (DPI). See New South Wales Weed Control Handbook (NSW DPI, 2018)
- Only pesticides registered for use near water may be used near any waterways

A list of approved pesticides is provided in Table 7 as per the Transgrid Schedule of Approved Pesticides (Rev 10, June 2023).

Table 7 Approved pesticides for Project use

Active Grade Constituent	Approved Product Name	Application Method/s	Target Species	Location of Use	Special Restrictions	Comments
Sodium Flouride 40-50% Paraffin Potassium Dichromate 2-4% Calcium Sulfate 5-8% Thixatropes 1-3%	Ausplast Wood pole preserving compound known as Ausplast	Plastic sheet, wrap around pole butt below ground level.	Protect timber from wood decay	Timber poles	Nil	Refer SDS for handling and storage requirements. SDS to be kept onsite and included in PWRA.
Metsulfuron methyl (600g/kg)	Brush Off Brush Controller	Granules dissolved for spraying	Woody brush and broadleaf weeds	Easements, Access Tracks, Premises and Construction works	Aquatic Hazard GHS Category 1 – 80m buffer from waterway Minimum PPE ¹	See label for exact dilution rates and application methodologies for each target species.
Sulfometuron methyl (75g/kg)	DuPont™ Oust Herbicide	Spray	Control of certain annual and perennial weeds	Easements, Access Tracks, Premises and Construction works	Aquatic Hazard GHS Category 1 – 80m buffer from waterway Minimum PPE ¹	See label for exact dilution rates and application methodologies for each target species.
300g/L Triclopyr 100g/L Picloram	Fightback Herbicide	Spray	Woody brush and broadleaf weeds	Easements, Access Tracks, Premises and Construction works	Aquatic Hazard GHS Category 1 – 80m buffer from waterway Minimum PPE ¹	See label for exact dilution rates and application methodologies for each target species.
Metsulfuron methyl (600g/kg)	Genfarm Metsulfuron 600WG Herbicide	Granules dissolved for spraying. Not approved under this schedule for granular application	Woody brush and broadleaf weeds	Easements, Access Tracks, Premises and Construction works	Nil	See label for exact dilution rates and application methodologies for each target species.
Triclopyr acid equiv. (300g/L) Picloram acid equiv. (100g/L) Aminopyralid (0.7%)	Grazon Extra Herbicide	Spray	Range of environmental and priority woody and herbaceous weeds	Easements, Access Tracks, Premises and Construction works	Aquatic Hazard GHS Category 1 – 80m buffer from waterway Minimum PPE ¹	See label for exact dilution rates and application methodologies for each target species. Consider alternative (if feasible)

Active Grade Constituent	Approved Product Name	Application Method/s	Target Species	Location of Use	Special Restrictions	Comments
MCPA dimethylamine salt 340g/l Dicamba dimethylamine salt 80g/l	Kamba M Selective herbicide	Spray	Certain broadleaf weeds	Depots, road verges	Aquatic Hazard GHS Category 2 – 40m buffer from waterway Minimum PPE1	Withholding period of 7 days
Metsulfuron methyl (600g/kg)	Kenso Agcare Ken-Met 600 Herbicide	Granules dissolved for spraying	Woody brush and broadleaf weeds	Easements, Access Tracks, Premises and Construction works	Aquatic Hazard GHS Category 2 – 40m buffer from waterway	See label for exact dilution rates and application methodologies for each target species. Consider alternative (if feasible)
300g/L Triclopyr 100g/L Picloram	Fightback Herbicide	Spray	Woody brush and broadleaf weeds	Easements, Access Tracks, Premises and Construction works	Aquatic Hazard GHS Category 1 – 80m buffer from waterway Minimum PPE1	See label for exact dilution rates and application methodologies for each target species.
Pindone	Rabbit Pindone Oat Bait	Prepared Baits	Rabbits Only	Substations and Premises Only	Nil	Can only be supplied to TransGrid by an Authorised Control Officer
Sodium fluoroacetate	Rabbit 1080 Carrot Bait	Prepared baits	Rabbits Only	Substations and Premises Only	Nil	Can only be supplied to TransGrid by an Authorised Control Officer
Rabbit haemorrhagic disease virus (RHDV)	Rabbit RHDV Baits	Prepared Baits	Rabbits Only	Transgrid owned land	Nil	Can only be supplied to TransGrid by an Authorised Control Officer
PAPP (paraaminopropiophenone)	PAPP Baits	Prepared baits	Vertebrate Pests Only	Transgrid owned land	Nil	Can only be supplied to TransGrid by an Authorised Control Officer
Disodium octaborate tetrahydrate 30-60% Sodium fluoride 1030%	PresChem Polesaver Rods and Bioguard	Drill and insert into timber poles	Termites/fungus	Easements	Nil	Refer to the product label for specific application methods.
Glyphosate Isopropylamine salt (360g/L) Surfactant (10-20%)	Roundup Biactive Herbicide	Spray Cut stump Stem injection	Non-selective control of annual and perennial weeds	Easements, Access Tracks, Premises and Construction works	Nil	See label for exact dilution rates and application methodologies for each target species.

Active Grade Constituent	Approved Product Name	Application Method/s	Target Species	Location of Use	Special Restrictions	Comments
Glyphosate Isopropylamine salt (360g/L) Surfactant (10-20%)	Roundup Herbicide	Spray Cut stump Stem injection	Non-selective control of annual and perennial weeds	Easements, Access Tracks, Premises and Construction works	Aquatic Hazard GHS Category 2 – 40m buffer from waterway Minimum PPE1	See label for exact dilution rates and application methodologies for each target species.
Glyphosate Isopropylamine salt (480g/L) Surfactant (10-20%)	Ripper 480 Herbicide	Spray Cut stump Stem injection	Non-selective herbicide for the control of many annual, perennial and woody weeds	Easements, Access Tracks, Premises and Construction works	Nil	See label for exact dilution rates and application methodologies for each target species.
Glyphosate Isopropylamine salt (540g/L) Surfactant (10%)	Roundup PowerMAX Herbicide	Spray Cut stump Stem injection	Non-selective control of annual and perennial weeds	Easements, Access Tracks, Premises and Construction works	Aquatic Hazard GHS Category 1 – 80m buffer from waterway Minimum PPE1	See label for exact dilution rates and application methodologies for each target species.
360 g/L GLYPHOSATE (present as the isopropylamine and mono-ammonium salts)	Weed-Master Duo Dual Salt Technology Herbicide	Handgun and knapsack	For the control of annual, perennial and aquatic weeds in many situations. Broad range of target species (refer to label)	Easements, Access Tracks, Premises and Construction works	Aquatic Hazard GHS Category 1 – 80m buffer from waterway Minimum PPE1	See label for exact dilution rates and application methodologies for each target species.
360 g/L GLYPHOSATE (present as the isopropylamine salts)	Wipe-Out Bio herbicide	Handgun and knapsack Spray, Cut stump, Stem injection	Non-selective control of annual and perennial weeds	Easements, Access Tracks, Premises and Construction works	Nil	See label for exact dilution rates and application methodologies for each target species.
5g/kg Hexaflumuron	Sentricon Ag Termite Baits	Above-ground bait in bait stations	Termites	Easements (timber poles)	Nil	See label for exact dilution rates and application methodologies. Highly toxic to aquatic invertebrates.
745g/L Fluproponate	Taskforce water Soluble Herbicide	Spray	Serrated Tussock, Chilean Needle Grass, African Love Grass.	Easements, Access Tracks, Premises and Construction Works	Aquatic Hazard GHS Category 2 – 40m buffer from waterway	See label for exact dilution rates and application methodologies for each target species.
Fipronil 100g/L	Termidor Residual Termicide and	Liquid mix applied to poles or soil	Termites	Only for protection of poles and fence posts	Nil	See label for application rates for target species.

Active Grade Constituent	Approved Product Name	Application Method/s	Target Species	Location of Use	Special Restrictions	Comments
	InsecticideR	Trenching and recirculation				
Triclopyr Triethylamine salt 200g/L Picloram salt 100g/L	Tordon Double Strength Herbicide	Spray Cut stump Stem injection	Woody weeds	Easements, Access Tracks, Premises and Construction works	Nil	Shall not be used near waterways See label for exact dilution rates and application methodologies for each target species.
Triclopyr Triethylamine Salt 200g/L Picloram trisopropanolamine salt 100g/L Aminopyralid Trisopropanolamine Salt 25g/L	Tordon Regrowth Master Herbicide	Cut stump Stem Injection Spray (blackberry and gorse only)	Acacia, angophora, Casuarina, Corymbia, Eucalypts (except Yellow Box) Lophostemon, and Melaleuca	Easements, Access Tracks, Premises and Construction works	Aquatic HazardGHS Category 1 – 80m buffer from waterway Minimum PPE ¹	Do not apply on sites where surface water from heavy rain is expected to run off to areas containing non-target or sensitive vegetation. Do not contaminate waterways with the chemical. Consider alternative (if feasible)
Various domestically available pesticides	Domestic pesticides (products generally available at supermarkets for example aerosol insect sprays, and vermin baits)	Must be applied by hand or by using handheld equipment	Insects and Rodents	Outdoors: use no more than five litres/five kilograms of concentrate or 20 litres/20 kilograms of ready-to-use product Indoors: use no more than one litre/one kilogram of concentrate or five litres/five kilograms of ready-to-use product	Nil	Products under this category apply to pesticides that are ordinarily used for domestic purposes (e.g. in the home or garden) and are widely available to the general public at retail outlets such as supermarkets or hardware stores

¹Minimum PPE refers to impervious gloves and eye protection, in addition to the direct controls stipulated in the SDS.

5.2.3 STOCKPILING AND DISPOSAL

To reduce the risk of weed, infested materials contaminating unaffected areas the following recommendations should be adhered to:

- Weed-infested materials will not be stockpiled near native vegetation or threatened species habitat wherever possible during topsoil stripping operations
- Weed material and weed-contaminated topsoil will be stockpiled separately during the clearing and grubbing program. The stockpiles will be covered with geofabric and regularly monitored by the Environment Team. If required, weeds will be treated prior to being used in site rehabilitation or landscaping works
- All classified weed material will be handled and disposed of lawfully
- All imported material is obtained from a source that is validated as weed and plant-pathogen-free

5.2.4 VEHICLE, PLANT AND EQUIPMENT HYGIENE

All vehicles, plant and equipment must be thoroughly cleaned to remove all soil and plant material and complete a Project-based Weed Hygiene Declaration form prior to being allowed to enter the site. Plant and equipment will be checked and cleaned before leaving the worksite that contains priority weeds.

The weed inspection is a two-stage inspection process, specifically:

- Plant, vehicles and equipment are to be inspected by the subcontractor prior to coming to site
- Plant, vehicles and equipment are to be inspected by the site representative when machinery is onsite

Inspections will ensure that no soil and/or organic matter that may contain weed reproductive material is present in or on areas that are accessible during regular cleaning and maintenance work.

Designated inspection areas will be at the site entrance to prevent the spread of weeds.

5.2.5 WEED-IMPACTED TOPSOIL

Weed control prior to clearing and topsoil recovery will help reduce the weed seed content within the topsoil, particularly if regard has been made for the timing of weed species germination. Even if pre-recovery weed control is conducted, weed seeds will remain within the topsoil and may germinate while the topsoil is stockpiled. Stockpiled topsoil can also accumulate a weed seed bank which will be spread when the stockpile is eventually utilised. As a mitigation measure, stockpiles will be covered with geofabric to control any new growth of weed species (from the weed seeds existing in the soil) and reduce the competition on site for planting or seeding.

Prior to the offsite disposal of weed-impacted topsoil (from aquatic or terrestrial areas), the Contractor must identify opportunities for the onsite re-use of weed-impacted topsoil and discuss opportunities with Transgrid for beneficial re-use onsite.

5.2.6 THREATENED INSECT HABITAT

Overall management of threatened insect habitat rehabilitation is discussed in Appendix G Threatened Insect Habitat Rehabilitation Plan. Weed control and maintenance should commence when required to prevent weed seed set, particularly of invasive priority and environmental weed species.

Table 8 details weed management for translocated soils in threatened species rehabilitation areas. Refer to Appendix G Threatened Insect Habitat Rehabilitation Plan for maps identifying threatened species rehabilitation areas.

Table 8. Weed management for Threatened Species Rehabilitation areas.

Action	Objective	Notes
Weed maintenance	• Establish and maintain native grass species emerging from translocated topsoils • Prevent establishment of priority and	• If present, control of weed growth upon scalped soil berms should commence in the first month following the completion of soil scalping and translocation – as far as is practicable, weed control efforts on the soil berms should aim to establish a predominately native species cover from species emerging from the soil seed bank

Action	Objective	Notes
	environmental weed species	• Weed control and maintenance at the soil translocation sites should be deferred for as long as possible to avoid trampling of emerging native seedlings • Weed control and maintenance should commence when required to prevent weed seed set, particularly of invasive priority and environmental weed species • Following commencement of weed control works, maintenance control of emerging populations of exotic species is to be undertaken every month up to 12 months following instalment as required, and then every 2 months from 13-24 months following instalment • As far as is practical, use of herbicide spray applications for maintenance weed control should be avoided • Maintenance weed control should aim to: – maintain the surroundings of any emerging NTG as weed-free – consolidate and expand native species patches – prevent/minimise weed seed set • The frequency of maintenance weed control visits should be increased if the prescribed visitation is insufficient to control weed growth • If natural regeneration from the soil seed bank is insufficient or unsuccessful, consideration should be given to supplementary seeding of provenance native species to establish a native species cover. The requirement for supplementary planting should be assessed in conjunction with monitoring and annual reporting of site works.

5.3 PATHOGEN CONTROL

No evidence of pathogens such as Root Rot (*Phytophthora cinnamomi*), Myrtle Rust (*Austropuccinia psidii*) and Chytrid Fungus (*Batrachochytrium dendrobatidis*) was recorded within the Project footprint. However, these have the potential to occur.

Safeguards, hygiene protocols and management measures to avoid and minimise the spread of pathogens during construction in line with Hygiene protocols for the control of diseases in Australian frogs (DCCEEW, 2011) are summarised in Table 10 and Table 11.

In the event of pathogen detection within the Project footprint, the Project Ecologist will assess the infected and surrounding areas to assign a risk level based on the following criteria:

- High Risk – Myrtle rust identified on host plants OR, extensive evidence of tree dieback potentially attributed to Phytophthora OR waterbodies containing suitable frog (vector) habitat
- Medium Risk – Small instances of tree dieback (more than three trees in close proximity) potentially affected by Phytophthora OR, small drainage lines within potential impact area containing suitable frog (vector) habitat
- Low Risk – No tree dieback evident, AND no evidence of myrtle rust on host plants AND low potential for surface water to persist and maintain frog (vector) habitat.

5.4 PEST CONTROL

NSW DPI describes principles that should be considered and implemented by all community, industry, landholders and other stakeholders in pest animal management:

- Be alert: Monitor and report sightings of any species you have not seen in your area before. Prevention and early intervention from the community are important to avoid the establishment of new pest animal species
- Work together and participate: Pest animal management is a shared responsibility between landholders, community, industry and Government and requires a coordinated approach across a range of scales and land tenures
- Be committed: Effective pest animal management requires an ongoing commitment by land managers, community, Government and industry. Those that create the risks associated with pest

species and those that benefit from the pest animal management outcomes should help to minimise impacts and contribute to the costs associated with management

- Stay up-to-date: Community, industry, government and landholders should stay up-to-date with new information to ensure that contemporary best practice pest animal management activities are employed to reduce pest animal impacts in a way that is as safe, effective, target-specific and humane as possible

5.4.1 ALERT SPECIES

Alert species are pest animals that may have been detected in the region but are not established or are present in other areas of the State but have not yet entered the region. Land managers and community members play a major role in reporting any unusual sightings of pest animals in the region. Alert species for the South East include cane toad, American corn snake, red-eared slider turtle, tilapia and mice if reaching plague proportions. Alert species for the Riverina include American corn snake, Hog deer, Rusa deer and Chital deer.

To report an unusual sighting or alert species, use the following methods:

- Complete the 'Report an unusual animal sighting form' through the following website <https://www.dpi.nsw.gov.au/biosecurity/forms/report-an-unusual-animal-sighting>
- Phone the Invasive Plants and Animals Enquiry Line: 1800 680 244, or
- Email: invasive.species@dpi.nsw.gov.au

5.4.2 PRIORITY SPECIES

Pest animals for the South East LLS region have been prioritised based on the level of risk and the feasibility of control as assessed through objective science-based prioritisation methods and expert advice. Pest animals for the Riverina region have been prioritised based on the level of risk and feasibility of control assessed through prioritisation guidelines using the South Australian Pest Animal Risk Management Guide and prioritisation tool.

Land managers are encouraged to report sightings of priority species to their nearest LLS office.

Table 9. Priority pest species for the South East and Riverina regions.

Region	Common name	Management category*
South East	Deer (all species)	Asset-based protection for existing established populations. For new incursions and/or isolated populations (as defined by the RPAC), the priority is to eradicate or contain if feasible.
	Wild rabbit	Asset-based protection
	Feral pig	Asset-based protection for existing established populations. For new incursions and/or isolated populations (as defined by the RPAC), the priority is to eradicate or contain if feasible.
	Wild dog	Asset-based protection
	Feral Cat	
	European Red Fox	
	Feral Goat	Asset-based protection for existing established populations.
	Wild horse	For new incursions and/or isolated populations (as defined by the RPAC), the priority is to eradicate or contain if feasible.
	Indian Myna	Limited action. Support projects managing this pest.
	Common Carp	
	Redfin perch	
Riverina	Common Carp	Asset-based Protection (Protecting assets and managing pest animal populations)
	European Red Fox	
	Feral Cat	
	Feral Goat	

Region	Common name	Management category*
	Feral Pig	
	Wild Deer (East of Hume Highway)	
	Wild Deer (West of Hume Highway)	Containment (Contain spread)
	Wild Dog (East of Hume Highway)	Asset-based Protection (Protecting assets and managing pest animal populations)
	Wild Dog (West of Hume Highway)	Eradicate
	Wild Horse	Asset-based Protection (Protecting assets and managing pest animal populations) Containment (Contain spread)
	Wild Rabbit	Asset-based Protection (Protecting assets and managing pest animal populations)

*Descriptions of management categories can be found in the respective Strategic Pest Animal Plans.

5.5 PROPERTY MANAGEMENT PLANS

All properties affected by the Project area will have a Property Management Plan, and where relevant, will contain specific 'on-farm' biosecurity requirements, highlight weeds/ diseases of concern on the property and in the local area and include detail on where biodiversity values are present for application of weed control and management actions. The Project will undertake surveys/assessments, including consultation with landowners/occupiers, to identify any biosecurity requirements in areas to be accessed for construction activities. Appropriate demarcation or signage (similar to those below) will be installed in areas identified as having biosecurity risks or requirements as outlined in the Property Management Plans.

5.6 MONITORING

Weed, pest and pathogen monitoring is discussed in Appendix H Flora and Fauna Monitoring Program.

5.7 INCIDENT NOTIFICATION

A biosecurity incident on the Project means the detection of a terrestrial contaminant or terrestrial species on freight, people, plant, or equipment on the Project that was not previously identified in the EIS as a result of Project activities. This would include a situation where there are weed species that were not previously identified in the EIS and are suspected to be spread to new locations as a result of Project activities. This would exclude weeds that might be detected on properties or previously known locations (adjacent to or in the study area), that are distant from Project activities. In the event of a biosecurity incident that has occurred as a result of construction activities, the process outlined in Section 3.8 of the CEMP will be implemented. Incident management and response will be undertaken in accordance with the incident reporting procedures detailed within the CEMP. Where a complaint is received in relation to a biosecurity issue or incident, the complaint will be managed in accordance with the process outlined in the Community Stakeholder Engagement Management Plan (CSEMP) and any further notifications or actions required will be undertaken in accordance with this plan.

There are several instances that require notification in accordance with the *Biosecurity Act 2015* and Biosecurity Regulation 2017. These include the requirement to notify a biosecurity event and the requirement to notify a certain pest or disease. Notification requirements with respect to biosecurity matters are detailed below.

5.7.1 NOTIFIABLE BIOSECURITY EVENTS AND PROHIBITED MATTER EVENTS

In accordance with Section 39 of the *Biosecurity Act 2015* (Act), a biosecurity event is something that has, is having, or could have a significant biosecurity impact. In terms of the Act, a biosecurity event does not involve prohibited matter. For example, a biosecurity event could be the sudden death of a flock of birds or a herd of cattle.

Prohibited matter is defined as any species listed in Schedule 2 of the *Biosecurity Act 2015*. Schedule 2 includes pests and diseases of plants and animals, diseases of aquatic animals, pest terrestrial invertebrates, terrestrial and freshwater weeds, and aquatic pests. Examples include the diseases African swine fever, foot and mouth disease, Hendra virus and the pest species Siam weed and rubber vine.

If any of these are identified on the Project site by the Project Ecologist or informed by Property Owners, during the construction delivery of the Project, the AG JV Environmental Manager would notify Transgrid and Department of Primary Industries. A person is required to immediately notify of a biosecurity event or prohibited matter event. All incidents and non-compliances will be managed in accordance with Section 3.8, Section 3.9.4 and Section 3.9.5 of the CEMP. In the event that unexpected impacts are identified, the contingency plan in Section 8.8 of the BMP will be followed.

5.7.2 NOTIFIABLE WEEDS

The *Biosecurity Regulation 2017* (Regulation) includes requirements for the notification of certain pests and diseases that are found in NSW and could have a severe effect on the economy, environment or community if not managed appropriately.

Pests and diseases that require notification are listed in:

- Schedule 2 of the Act
- Schedule 1 of the Regulation

In terms of diseases identified as animal diseases of concern (under the *Biosecurity Act 2015* and Regulation), sheep footrot and OJD are notifiable diseases.

The list of notifiable pests and diseases in the *Biosecurity Act 2015* and Regulation is large and they typically require specialist knowledge to identify. The list is not, therefore, repeated within this plan. No notifiable pests or diseases were identified as occurring or likely to occur in the Project area. The presence of notifiable pests or diseases on the Project would be identified in the Property Management Plans in consultation with landholders/ property owners or as advised by the Department of Primary Industries.

5.7.3 NOTIFIABLE PESTS OR PATHOGENS

Biosecurity zones cover most of NSW (see Section 2.8), including the Project area and require landowners and occupiers to notify the local control authority in accordance with section 30 and section 38 of the *Biosecurity Act 2015* of a new infestation of the weeds and destroy or suppress the weeds.

Suspicion or awareness of prohibited matters and biosecurity events must be immediately reported verbally to an authorised officer. This can be done by phoning:

- The Animal Disease Hotline 1800 675 888 (24-hour hotline), or
- Your Local Land Services 1300 795 299 (during working hours)

Suspicion or awareness of other listed notifiable pests and diseases of animals must be notified within one working day. This can be done by:

- Phoning Local Land Services 1300 795 299, or
- Contacting a NSW Department of Primary Industries authorised officer, or
- For less urgent cases (that are not potentially prohibited matter or a biosecurity event) it is possible to use the Notifiable Pests and Diseases of Animals Reporting Form to notify. When in doubt as to whether you are dealing with a prohibited matter, a biosecurity event, or another listed notifiable pest or disease of animals, it is better to phone to ensure you fulfil your duty to notify.

5.7.4 RESPONSIBILITY

In the case of a pest or disease that is listed as a prohibited matter in Schedule 2 of the *Biosecurity Act 2015* or a biosecurity event, the duty to notify applies only if the person has anything to do with the premise in which the pest and disease is identified or suspected. This could include the owner (Transgrid) or occupier of the premise (AG JV). Table 10 summarises the weeds identified during the EIS and provides the actions required under the *Biosecurity Act 2015*.

In the case of a pest or disease that is listed as notifiable in Schedule 1 of the Regulation, the duty to notify applies to any person who is aware of the presence or suspected presence of the pest or disease.

AG JV will notify Transgrid and the NSW Department of Primary Industries (DPI). DPI indicates that there are several contact points based on what the issue is. As a first point of call, it is recommended to contact DPI Biosecurity on 1800 680 244.

Where it is an animal pest, AG JV will advise the relevant property owner (should the property owner wish to be informed).

5.8 TRIGGER ACTION RESPONSE PLAN

A Trigger Action Response Plan (TARP) for key biosecurity threats including known biosecurity threats to threatened species and populations per UMM B22 is provided in Table 10.

Table 10 Trigger, Action, Response Plan for key biosecurity threats

Performance Goal	Management	Monitoring	Trigger	Action Response
Prevent establishment of priority and environmental weed species in threatened insect rehabilitation areas	Implementation of measures detailed in Table 7 of this Plan	Implemented as per Section 8.3 of the BMP	Detection of priority and environmental weed species in threatened insect rehabilitation areas.	Implement weed control methods to prevent weed seed set and remove plant species. Increase frequency of maintenance weed control visits.
Prevent establishment and spread of pathogens such as Root Rot (<i>Phytophthora spp.</i>), Myrtle Rust (<i>Austropuccinia psidii</i>) and Chytrid Fungus (<i>Batrachochytrium dendrobatidis</i>) within the Project footprint.	Implementation of measures and hygiene protocols and measures in this Plan. If construction vehicles required to move through areas of known or likely infestation, hygiene protocols detailed in this Plan to be implemented.	Weed Monitoring Pre-clearing surveys undertaken by Project Ecologists. Property Management Plan implementation with Property Owners.	Detection of listed pathogens within Project footprint.	Stop work immediately if construction activities occur in detection areas. Ecologist to assess the detection area, seek confirmation of pathogen and assign risk levels to impacted and surrounding areas. Investigate the event. Determine if an incident or non-compliance has occurred in accordance with Section 3.8 and Section 3.9 of the CEMP Revise the BMP to include additional controls as required. Works can only recommence once the Environment and Sustainability Manager has confirmed that appropriate measures to limit the potential recurrence of the event, have been implemented.
Prevent establishment and spread of pests such as fire ants and Varroa mites (<i>Varroa jacobsoni</i> and <i>V. destructor</i>) within the Project footprint.	Implementation of measures and hygiene protocols and measures in this Plan. Guidance from DPI must be applied when relocating or managing bees and/ or beehives of honeybees. Implement measures within Biosecurity (Fire Ant) Emergency Order (No 3) 2024 including restrictions on the movement of fire ant carriers	Weed Monitoring Pre-clearing surveys and reports Weekly Environmental Inspections	Detection of listed pests within Project footprint.	Stop work immediately if construction activities occur in detection areas. Ecologist to assess the detection area, seek confirmation of pest. Investigate the event. Determine if an incident or non-compliance has occurred in accordance with Section 3.8 and Section 3.9 of the CEMP Revise the BMP to include additional controls as required.

Performance Goal	Management	Monitoring	Trigger	Action Response
	into NSW from the fire ant infested area of Queensland.			Works can only recommence once the Environment and Sustainability Manager has confirmed that appropriate measures to limit the potential recurrence of the event, have been implemented.
Prevent biosecurity events and prohibited matter events within the Project footprint	Implement the management measures within this Plan.	Pre-clearing surveys undertaken by Project Ecologists Property Management Plan implementation with Property Owners	Identification of a biosecurity event and or prohibited matter event within the Project footprint.	If identified during construction delivery of the Project, AG JV Environmental Manager to notify Transgrid and Department of Primary Industries (if AG JV is the occupier of the Project site at the time).
Prevent the spread of weed species within the Project area and in the surrounding habitat as a result of the works	Weeds identified during pre-clearing surveys in line with Appendix B Vegetation Clearing Procedure. Weeds removed during vegetation clearance that are likely to regenerate will be treated on site or bagged, removed from site and disposed of at a licensed waste disposal facility. All classified weed material will be handled and disposed of lawfully. All machinery and equipment will be inspected for mud, weed seeds and weed propagules prior to entering the Project area. Implementation of Property Management Plans. Manage and control weeds in accordance with this Plan.	Weed Monitoring Pre-clearing surveys and reports Weekly Environmental Inspections Hygiene Inspection Forms completed by all Supplier/owner of plant and equipment Waste managed as per Waste Management Plan	Detection of new infestations of notifiable weeds, pests or diseases identified in Project areas owned by Transgrid and/or occupied by AG JV	AGJV Environment Manager to notify Transgrid and report the infestation to the relevant local control authority Follow up weed treatment for any weeds established as a result of the Project within the Project area and surrounding habitat. Reiterate hygiene controls in prestart and toolbox talks.

5.9 MANAGEMENT MEASURES

The management measures outlined in Table 11 will be implemented to minimise biosecurity impacts.

Table 11. Biosecurity management measures.

ID	Measurement/ Requirement	Timing	Responsibility
BS1	All construction personnel and subcontractors will attend the Project induction which will include awareness of priority weeds, content regarding the importance of preventing weeds from entering the Project site and the measures that must be taken for vehicles, machinery and plant used on the Project.	Pre-construction Construction	HSSE Manager
BS2	Prior to arriving on the Project site, the supplier/owner of plant and equipment shall complete a Hygiene Inspection Form. If a Hygiene Inspection Form is not present or completed prior to arrival, one will be completed by the deliverer prior to inspection. Vehicles and machinery should arrive onsite free of sources of potential contaminants including vegetative material and mud. All vehicles and mobile plant will be inspected on arrival at the construction compounds. A Hygiene Inspection Form with an assigned inspection number will be issued for vehicle/plant assets inspected as required. If plant or equipment arrives on the Project site unclean it will either be washed down at the site compound or be removed from the Project site by the supplier/owner and cleaned at an appropriate facility.	Pre-construction Construction	Subcontractor/owner/suppliers Plant Department or delegate
BS3	The specific controls applicable to a property will be identified in consultation with the affected landholder, documented in a Property Management Plan as appropriate and implemented during all relevant site activities. The effectiveness of these controls will be monitored at a time interval consistent with the level of risk	Pre-construction Construction	Community Engagement Team Environmental Manager
BS4	Where any of the weeds listed in the Biosecurity Management Plan are identified during construction, consultation (where relevant or required) will occur with landholders. Consultation will also occur with the relevant authority (Local Land Services (LLS), the relevant local council, and/or NSW Department of Primary Industries) in relation to notifiable weeds.	Construction	Environmental Manager
BS5	Cleaning of vehicles and machinery will occur at designated clean-down bays prior to movement onto the construction work areas or between properties (as required by the Property Management Plans).	Construction	All personnel
BS6	Water from clean down bays will drain to a contained sump/low point and materials (sediments) from clean down bays will be contained and disposed of in accordance with the Waste Management Plan.	Construction	Supervisor Environmental Manager Environmental Advisor
BS7	Dust suppression operations to consider the sourcing of suitable water resources where introduction of Chytrid is possible. Any machinery used during instream works should be verified as clean and free of potential weeds and pathogens to avoid biosecurity risk. Plan works to commence in low risk areas and move to medium risk areas and last in high risk areas.	Construction	Supervisor Environmental Manager
BS8	In the event of a confirmed pathogen detection within the Project footprint, plan works to commence in low risk areas and move to medium risk areas and last in high risk areas. Access to medium and high risk zones (identified by the Project Ecologist) where pathogens listed in Section 5.3 have been identified should be restricted with the specific control measures implemented for the disposal of material or hygiene in these zones. Medium and high risk pathogen zones, are to be marked on	Construction	Supervisor Environmental Manager

ID	Measurement/ Requirement	Timing	Responsibility
	relevant plans and ECMs, with wash-down facilities provided to prevent potential pathogens from spreading beyond the area.		
BS9	Instances of myrtle rust on host plants identified during construction are to be verified by an ecologist or the environment manager. If medium or high risk areas identified in pathogen zones cannot be avoided during construction, testing of soils or plant material is to be undertaken to confirm the presence or absence of Phytophthora. If a medium to high risk zone is identified for Chytrid and the management measures identified herein cannot be practically achieved, then samples of water and/or testing of common frogs is to be undertaken by ecologists with samples sent to a National Associated of Testing Authorities accredited laboratory.	Construction	Supervisor Environmental Manager Environmental Advisor
BS10	Where soil pathogens are identified, either by testing or visual pre-clearance surveys, the soil should not be re-used in areas where sensitive environmental receptors such as threatened species or ecological communities are present.	Construction	Supervisor Environmental Manager Environmental Advisor
BS11	In the event of a confirmed pathogen detection within the Project footprint, plant material in medium to high risk areas should be stockpiled separately and in the contaminated area before being burned onsite. Do not dispose of water outside of the catchment from which it was obtained.	Construction	Supervisor Environmental Manager Environmental Advisor
BS12	As required, site demarcation or signage will be installed in areas of significant biosecurity risk where access is required.	Construction	Environmental Manager Environmental Advisor
BS13	The locations of permanent structures (and the extent of associated construction areas or compounds) will be located where possible to avoid or minimise impacts, or as agreed with the affected landholder, on locations of high biosecurity risk.	Construction	Engagement Manager Environmental Advisor
BS14	Vehicle and equipment movements across adjoining farmland, including trip numbers and locations, will be minimised where possible where localised areas of high biosecurity risks have been identified.	Construction	Supervisor Environmental Manager Environmental Advisor
BS15	If during construction, new infestations of notifiable weeds, pests or diseases are identified in Project areas that are owned by Transgrid and/or occupied by AG JV, the Environment Manager will notify Transgrid and will report the infestation to the relevant local control authority.	If required during construction only	Environmental Manager
BS16	Weeds are to be identified as part of pre-clearing inspections by the Project Ecologist	Preconstruction	Ecologist
BS17	Weeds are to be managed appropriately in accordance with legislative (or local control authority) requirements and may use a range of options in proximity to the accommodation camps and construction compounds, including but not limited to: • slashing (timing/species dependent) • onsite burning • onsite deep burial	Construction	Supervisor Environmental Manager Environmental Advisor

ID	Measurement/ Requirement	Timing	Responsibility
	stockpile spraying		
BS18	Use a certified supply of plants that is disease-free. Soil and fill is to be sourced from suppliers that can provide certification that the material is free of disease and weed propagules. Where works are undertaken in the vicinity (within 100 m) of waterways, the use of water externally sourced should be minimised or prioritise the use of potable water.	Construction	Supervisor Environmental Manager Environmental Advisor
BS19	Weed control will be guided by existing Transgrid operational weed management procedures. During maintenance activities, general biosecurity duty obligations will be implemented as per existing Transgrid procedures. Biosecurity risks within the work footprint, such as weeds, would also be assessed and control measures implemented, as required, to manage existing or emerging issues.	Operation	Supervisor Environmental Manager Environmental Advisor

6. WEED IDENTIFICATION GUIDE AND BIOSECURITY RECOMMENDATIONS FOR MANAGEMENT IN THE PROJECT AREA

Priority weeds and WoNS identified within the Project site and their biosecurity management recommendations are presented in Table 12.

Table 12. Weed identification guide and biosecurity recommendations

Scientific Name (Common Name)	State Priority Weed	Reg. Priority Weeds	WoNS	Other Regional Weeds	General Biosecurity Duty	Biosecurity duty prohibition on certain dealings	Biosecurity duty LLS region	Images
<i>Ailanthus altissima</i> (Tree of Heaven)				X			General Biosecurity Duty	 

Scientific Name (Common Name)	State Priority Weed	Reg. Priority Weeds	WoNS	Other Regional Weeds	General Biosecurity Duty	Biosecurity duty prohibition on certain dealings	Biosecurity duty LLS region	Images
<i>Alternanthera pungens</i> (Khaki Weed)				X			General Biosecurity Duty	 
<i>Aristea ecklonii</i> (Blue Stars/Blue Corn-lily)				X			General Biosecurity Duty	 

Scientific Name (Common Name)	State Priority Weed	Reg. Priority Weeds	WoNS	Other Regional Weeds	General Biosecurity Duty	Biosecurity duty prohibition on certain dealings	Biosecurity duty LLS region	Images
<i>Asparagus asparagoides</i> (Bridal Creeper)				X		Must not be imported into the state, sold, bartered, exchanged or offered for sale.	General Biosecurity Duty	 
<i>Asparagus species</i> (Asparagus Weeds)	X						General Biosecurity Duty	

Scientific Name (Common Name)	State Priority Weed	Reg. Priority Weeds	WoNS	Other Regional Weeds	General Biosecurity Duty	Biosecurity duty prohibition on certain dealings	Biosecurity duty LLS region	Images
<i>Austrocylindropuntia cylindrica</i> (Cane Cactus)	X					Must not be imported into the state, sold, bartered, exchanged or offered for sale.	General Biosecurity Duty	 
<i>Baccharis halimifolia</i> (Groundsel Bush)		X					South East: Regional Recommended Measure* (for Regional Priority - Eradication) Land managers should mitigate the risk of the plant being introduced to their land. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant. Notify local control authority if found.	 

Scientific Name (Common Name)	State Priority Weed	Reg. Priority Weeds	WoNS	Other Regional Weeds	General Biosecurity Duty	Biosecurity duty prohibition on certain dealings	Biosecurity duty LLS region	Images
<i>Bryophyllum spp</i> (Mother of Millions)		X					Riverina: Regional Recommended Measure* (for Regional Priority - Eradication) Land managers should mitigate the risk of the plant being introduced to their land. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant. Notify local control authority if found. Your local biosecurity weeds officer can help to identify, advise on control, and how to remove this weed.	 
<i>Carduus nutans</i> (Nodding Thistle)	X						General Biosecurity Duty	 

Scientific Name (Common Name)	State Priority Weed	Reg. Priority Weeds	WoNS	Other Regional Weeds	General Biosecurity Duty	Biosecurity duty prohibition on certain dealings	Biosecurity duty LLS region	Images
<i>Carthamus lanatus</i> (Saffron Thistle)	X						General Biosecurity Duty	 
<i>Cenchrus incertus</i> & <i>C. longispinus</i> (Spiny Burr Grass)				X			General Biosecurity Duty	 

Scientific Name (Common Name)	State Priority Weed	Reg. Priority Weeds	WoNS	Other Regional Weeds	General Biosecurity Duty	Biosecurity duty prohibition on certain dealings	Biosecurity duty LLS region	Images
<i>Centaurea calcitrapa</i> (Star Thistle)				X			General Biosecurity Duty	 
<i>Centaurea solstitialis</i> (St. Barnaby's Thistle)	X						General Biosecurity Duty	 

Scientific Name (Common Name)	State Priority Weed	Reg. Priority Weeds	WoNS	Other Regional Weeds	General Biosecurity Duty	Biosecurity duty prohibition on certain dealings	Biosecurity duty LLS region	Images
<i>Cestrum parqui</i> (Green Cestrum)					X		Riveria: Regional Recommended Measure* (for Regional Priority - Eradication) Land managers should mitigate the risk of the plant being introduced to their land. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant. Notify local control authority if found.	 
<i>Chrysanthemoides monilifera</i> ssp. <i>Monilifera</i> (Boneseed)	X					Must not be imported into the state, sold, bartered, exchanged or offered for sale. Control Order Boneseed Control Zone (Whole of NSW): Owners and occupiers of land on which there is boneseed must notify the local control authority of new infestations; immediately	General Biosecurity Duty	 

Scientific Name (Common Name)	State Priority Weed	Reg. Priority Weeds	WoNS	Other Regional Weeds	General Biosecurity Duty	Biosecurity duty prohibition on certain dealings	Biosecurity duty LLS region	Images
						destroy the plants; ensure subsequent generations are destroyed; and ensure the land is kept free of the plant. A person who deals with a carrier of boneseed must ensure the plant (and any seed and propagules) is not moved from the land; and immediately notify the local control authority of the presence of the plant.		



Scientific Name (Common Name)	State Priority Weed	Reg. Priority Weeds	WoNS	Other Regional Weeds	General Biosecurity Duty	Biosecurity duty prohibition on certain dealings	Biosecurity duty LLS region	Images
<i>Chrysanthemoides monilifera</i> ssp. <i>Rotundata</i> (Bitou Bush)	X	X				Must not be imported into the state, sold, bartered, exchanged or offered for sale. Biosecurity Zone Within the Biosecurity Zone, this weed must be eradicated where practicable, or as much of the weed destroyed as practicable, and any remaining weed suppressed. The local control authority must be notified of any new infestations of this weed within the Biosecurity Zone	General Biosecurity Duty	 

Scientific Name (Common Name)	State Priority Weed	Reg. Priority Weeds	WoNS	Other Regional Weeds	General Biosecurity Duty	Biosecurity duty prohibition on certain dealings	Biosecurity duty LLS region	Images
<i>Cirsium arvense</i> (Perennial Thistle)	X						General Biosecurity Duty	 
<i>Cirsium vulgare</i> (Spear Thistle)	X						General Biosecurity Duty	 

Scientific Name (Common Name)	State Priority Weed	Reg. Priority Weeds	WoNS	Other Regional Weeds	General Biosecurity Duty	Biosecurity duty prohibition on certain dealings	Biosecurity duty LLS region	Images
<i>Conyza bonariensis</i> (Flaxleaf Fleabane)	X						General Biosecurity Duty	 
<i>Cortaderia jubata</i> (Pink Pampas Grass)		X					General Biosecurity Duty	

Scientific Name (Common Name)	State Priority Weed	Reg. Priority Weeds	WoNS	Other Regional Weeds	General Biosecurity Duty	Biosecurity duty prohibition on certain dealings	Biosecurity duty LLS region	Images
<i>Cortaderia spp.</i> (Pampas Grass)				X			General Biosecurity Duty	 
<i>Crataegus monogyna</i> (Hawthorn)	X						General Biosecurity Duty	 

Scientific Name (Common Name)	State Priority Weed	Reg. Priority Weeds	WoNS	Other Regional Weeds	General Biosecurity Duty	Biosecurity duty prohibition on certain dealings	Biosecurity duty LLS region	Images
<i>Cuscuta campestris</i> (Golden Dodder)				X			General Biosecurity Duty	 
<i>Cylindropuntia</i> spp. (Prickly Pear)				X		Must not be imported into the state, sold, bartered, exchanged or offered for sale.	General Biosecurity Duty	 

Scientific Name (Common Name)	State Priority Weed	Reg. Priority Weeds	WoNS	Other Regional Weeds	General Biosecurity Duty	Biosecurity duty prohibition on certain dealings	Biosecurity duty LLS region	Images
<i>Cytisus scoparius</i> (Scotch Broom)		X				Must not be imported into the state, sold, bartered, exchanged or offered for sale.	Riverina: Regional Recommended Measure* (for Regional Priority - Containment) Within exclusion zone: Land managers should mitigate the risk of the plant being introduced to their land. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant. Notify local control authority if found. Within core infestation area: Land managers should mitigate the risk of the plant being introduced to their land. Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.	 
<i>Datura stramonium</i> (Common Thornapple)	X						General Biosecurity Duty	 

Scientific Name (Common Name)	State Priority Weed	Reg. Priority Weeds	WoNS	Other Regional Weeds	General Biosecurity Duty	Biosecurity duty prohibition on certain dealings	Biosecurity duty LLS region	Images
<i>Dolichandra unguiscati</i> (Cat's Claw Creeper)				X			General Biosecurity Duty	 
<i>Echium italicum</i> (Italian Bugloss)	X						General Biosecurity Duty	 

Scientific Name (Common Name)	State Priority Weed	Reg. Priority Weeds	WoNS	Other Regional Weeds	General Biosecurity Duty	Biosecurity duty prohibition on certain dealings	Biosecurity duty LLS region	Images
<i>Echium plantagineum</i> (Patterson's Curse)	X						General Biosecurity Duty	 
<i>Eichhornia crassipes</i> (Water Hyacinth)		X		X		Must not be imported into the state, sold, bartered, exchanged or offered for sale. Biosecurity Zone Within the Biosecurity Zone this weed must be eradicated where practicable, or as much of the weed destroyed as practicable, and any remaining weed suppressed.	General Biosecurity Duty	 

Scientific Name (Common Name)	State Priority Weed	Reg. Priority Weeds	WoNS	Other Regional Weeds	General Biosecurity Duty	Biosecurity duty prohibition on certain dealings	Biosecurity duty LLS region	Images
						The local control authority must be notified of any new infestations of this weed within the Biosecurity Zone		
<i>Emex australis</i> (Spiny Emex)				X			General Biosecurity Duty	 

Scientific Name (Common Name)	State Priority Weed	Reg. Priority Weeds	WoNS	Other Regional Weeds	General Biosecurity Duty	Biosecurity duty prohibition on certain dealings	Biosecurity duty LLS region	Images
<i>Eragrostis curvula</i> (African Lovegrass)	X	X		X			General Biosecurity Duty	 
<i>Erica lusitanica</i> (Spanish Heath)		X		X			South East: Regional Recommended Measure* (for Regional Priority - Containment) Whole of region: Land managers mitigate the risk of new weeds being introduced to their land. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant. Within exclusion zone: Land managers should eradicate the plant from the land and keep the land free of the plant. Notify local control authority if found. Within containment zone: Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value. Land managers should mitigate spread of the plant from their land.	 

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<i>Festuca gautieri</i> (Bear-skin Fescue)				X			General Biosecurity Duty	 
<i>Genista monspessulana</i> (Montpellier Broom)		X				Must not be imported into the state, sold, bartered, exchanged or offered for sale.	Riverina: Regional Recommended Measure* (for Regional Priority - Eradication) Land managers should mitigate the risk of the plant being introduced to their land. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant. Notify local control authority if found. Your local biosecurity weeds officer can help to identify, advise on control, and how to remove this weed.	 

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<i>Gleditsia triacanthos</i> (Honey Locust)				X			General Biosecurity Duty	 
<i>Gloriosa superba</i> (Glory Lily)				X			General Biosecurity Duty	 

Scientific Name (Common Name)	State Priority Weed	Reg. Priority Weeds	WoNS	Other Regional Weeds	General Biosecurity Duty	Biosecurity duty prohibition on certain dealings	Biosecurity duty LLS region	Images
<i>Glyceria maxima</i> (Reed Sweet-grass)				X			General Biosecurity Duty	 
<i>Harrisia martinii</i> and <i>H. tortuosa</i> (Harrisia Cactus)				X			General Biosecurity Duty	 

Scientific Name (Common Name)	State Priority Weed	Reg. Priority Weeds	WoNS	Other Regional Weeds	General Biosecurity Duty	Biosecurity duty prohibition on certain dealings	Biosecurity duty LLS region	Images
<i>Heliotropium amplexicaule</i> (Blue Heliotrope)				X			General Biosecurity Duty	 
<i>Hydrocleys nymphoides</i> (Water Poppy)				X			Riverina: Regional Recommended Measure* (for Regional Priority - Prevention) Land managers should mitigate the risk of the plant being introduced to their land. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant. Notify local control authority if found. Your local biosecurity weeds officer can help to identify, advise on control, and how to remove this weed. South East: Regional Recommended Measure* (for Regional Priority - Eradication) Land managers should mitigate the risk of the plant being introduced to their land. Land managers should eradicate the plant from the land and keep the land	 

Scientific Name (Common Name)	State Priority Weed	Reg. Priority Weeds	WoNS	Other Regional Weeds	General Biosecurity Duty	Biosecurity duty prohibition on certain dealings	Biosecurity duty LLS region	Images
							free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant. Notify local control authority if found.	
<i>Hymenachne amplexicaulis</i> and hybrids (Hymenachne)				X		Must not be imported into the state, sold, bartered, exchanged or offered for sale.	General Biosecurity Duty	 

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<i>Hyparrhenia hirta</i> (Coolatai Grass)		X					Riverina: Regional Recommended Measure* (for Regional Priority - Containment) Within exclusion zone: Land managers should mitigate the risk of the plant being introduced to their land. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant. Notify local control authority if found. Within core infestation area: Land managers should mitigate the risk of the plant being introduced to their land. Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value. South East: Regional Recommended Measure* (for Regional Priority - Containment) Whole of region: Land managers mitigate the risk of new weeds being introduced to their land. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant. Within exclusion zone: Land managers should eradicate the plant from the land and keep the land free of the plant. Notify local control authority if found. Within containment zone: Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value. Land managers should mitigate spread of the plant from their land.	 

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<i>Hypericum perforatum</i> (St. John's Wort)	X			X			General Biosecurity Duty	 
<i>Hypericum triquetrifolium</i> (Tangled Hypericum)				X			General Biosecurity Duty	 

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<i>Ibicella lutea</i> or <i>Proboscidea louisianica</i> (Devil's Claw)				X			General Biosecurity Duty	 
<i>Lantana camara</i> (Lantana)	X	X				Must not be imported into the state, sold, bartered, exchanged or offered for sale.	South East: Regional Recommended Measure* (for Regional Priority - Containment) Whole of region: Land managers mitigate the risk of new weeds being introduced to their land. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant. Within exclusion zone: Land managers should eradicate the plant from the land and keep the land free of the plant. Notify local control authority if found. Within containment zone: Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value. Land managers should mitigate spread of the plant from their land.	 

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<i>Leucanthemum vulgare</i> (Ox-eye Daisy)		X					General Biosecurity Duty	
<i>Leycesteria Formosa</i> (Himalaya Honeysuckle)				X			General Biosecurity Duty	

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<i>Ligustrum lucidum</i> (Privet (broad-leaf))				X			General Biosecurity Duty	 
<i>Ligustrum sinense</i> (Privet (narrow-leaf))				X			General Biosecurity Duty	 

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<i>Limonium hyblaenum</i> (Sicilian Sea Lavender)				X			General Biosecurity Duty	 
<i>Ludwigia longifolia</i> (Long Leaf Willow Primrose)				X			South East: Regional Recommended Measure* (for Regional Priority - Eradication) Land managers should mitigate the risk of the plant being introduced to their land. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant. Notify local control authority if found.	 

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<i>Lycium ferocissimum</i> (African Boxthorn)	X					Must not be imported into the state, sold, bartered, exchanged or offered for sale	General Biosecurity Duty	 

Scientific Name (Common Name)	State Priority Weed	Reg. Priority Weeds	WoNS	Other Regional Weeds	General Biosecurity Duty	Biosecurity duty prohibition on certain dealings	Biosecurity duty LLS region	Images
<i>Marrubium vulgare</i> (White Horehound)	X						General Biosecurity Duty	 
<i>Nassella hyaline</i> (Cane Needle Grass)				X			General Biosecurity Duty	 

Scientific Name (Common Name)	State Priority Weed	Reg. Priority Weeds	WoNS	Other Regional Weeds	General Biosecurity Duty	Biosecurity duty prohibition on certain dealings	Biosecurity duty LLS region	Images
<i>Nassella neesiana</i> (Chilean Needle Grass)	X	X	X			Must not be imported into the state, sold, bartered, exchanged or offered for sale.	Riverina: Regional Recommended Measure* (for Regional Priority - Eradication) Land managers should mitigate the risk of the plant being introduced to their land. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant. Notify local control authority if found. Your local biosecurity weeds officer can help to identify, advise on control, and how to remove this weed.	 
<i>Nassella trichotoma</i> (Serrated Tussock)	X	X	X			Must not be imported into the state, sold, bartered, exchanged or offered for sale.	Riverina: Regional Recommended Measure* (for Regional Priority - Eradication) Land managers should mitigate the risk of the plant being introduced to their land. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant. Notify local control authority if found. Your local biosecurity weeds officer can help to identify, advise on control, and how to remove this weed.	 

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<i>Onopordum acanthium</i> (Scotch Thistle)	X						General Biosecurity Duty	 
<i>Opuntia</i> and <i>Cylindropuntia</i> species	X					Must not be imported into the state, sold, bartered, exchanged or offered for sale.	General Biosecurity Duty	 

Scientific Name (Common Name)	State Priority Weed	Reg. Priority Weeds	WoNS	Other Regional Weeds	General Biosecurity Duty	Biosecurity duty prohibition on certain dealings	Biosecurity duty LLS region	Images
<i>Paederia foetida</i> (Skunk Vine)				X			General Biosecurity Duty	 
<i>Persicaria chinensis</i> (Chinese Knotweed)				X			General Biosecurity Duty	 

Scientific Name (Common Name)	State Priority Weed	Reg. Priority Weeds	WoNS	Other Regional Weeds	General Biosecurity Duty	Biosecurity duty prohibition on certain dealings	Biosecurity duty LLS region	Images
<i>Phalaris arundinacea</i> (Reed Canary Grass)				X			General Biosecurity Duty	 
<i>Physalis hederifolia</i> (Prairie Ground Cherry)		X					Riverina: Regional Recommended Measure* (for Regional Priority - Eradication) Land managers should mitigate the risk of the plant being introduced to their land. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant. Notify local control authority if found. Your local biosecurity weeds officer can help to identify, advise on control, and how to remove this weed.	 

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<i>Physalis longifolia</i> (Perennial Ground Cherry)		X					Riverina: Regional Recommended Measure* (for Regional Priority - Eradication) Land managers should mitigate the risk of the plant being introduced to their land. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant. Notify local control authority if found. Your local biosecurity weeds officer can help to identify, advise on control, and how to remove this weed.	 
<i>Pueraria lobata</i> (Kudzu)				X			South East: Regional Recommended Measure* (for Regional Priority - Eradication) Land managers should mitigate the risk of the plant being introduced to their land. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant. Notify local control authority if found.	 

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<i>Rosa rubiginosa</i> (Sweet Briar)	X						General Biosecurity Duty	 
<i>Rubus fruticosus</i> sp. agg. (Blackberry complex)	X		X			Must not be imported into the state, sold, bartered, exchanged or offered for sale. All species in the <i>Rubus fruticosus</i> species aggregate have this requirement, except for the varieties Black Satin, Chehalem, Chester Thornless, Dirksen Thornless, Loch Ness,	General Biosecurity Duty	 

Scientific Name (Common Name)	State Priority Weed	Reg. Priority Weeds	WoNS	Other Regional Weeds	General Biosecurity Duty	Biosecurity duty prohibition on certain dealings	Biosecurity duty LLS region	Images
						Murrindindi, Silvan, Smooth Stem, and Thornfree		
<i>Rubus niveus</i> (White Blackberry)				X			General Biosecurity Duty	 

Scientific Name (Common Name)	State Priority Weed	Reg. Priority Weeds	WoNS	Other Regional Weeds	General Biosecurity Duty	Biosecurity duty prohibition on certain dealings	Biosecurity duty LLS region	Images
<i>Salix spp.</i> (Willow)	X	X	X			Must not be imported into the state, sold, bartered, exchanged or offered for sale. All species in the <i>Salix</i> genus have this requirement, except <i>Salix babylonica</i> (weeping willows), <i>Salix x calodendron</i> (pussy willow) and <i>Salix x reichardtii</i> (sterile pussy willow)	General Biosecurity Duty	 
<i>Senecio jacobea</i> (Ragwort)				X			General Biosecurity Duty	

Scientific Name (Common Name)	State Priority Weed	Reg. Priority Weeds	WoNS	Other Regional Weeds	General Biosecurity Duty	Biosecurity duty prohibition on certain dealings	Biosecurity duty LLS region	Images
<i>Senecio madagascariensis</i> (Fireweed)	X		X			Must not be imported into the state, sold, bartered, exchanged or offered for sale.	Riverina: Regional Recommended Measure* (for Regional Priority - Eradication) Land managers should mitigate the risk of the plant being introduced to their land. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant. Notify local control authority if found. Your local biosecurity weeds officer can help to identify, advise on control, and how to remove this weed.	 
<i>Solanum elaeagnifolium</i> (Silverleaf Nightshade)	X					Must not be imported into the state, sold, bartered, exchanged or offered for sale.	South East: Regional Recommended Measure* (for Regional Priority - Eradication) Land managers should mitigate the risk of the plant being introduced to their land. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant. Notify local control authority if found.	 

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<i>Solanum viarum</i> (Tropical Soda Apple)		X				Control Order Tropical Soda Apple Control Zone (Whole of NSW): Owners and occupiers of land on which there is tropical soda apple must notify the local control authority of new infestations; destroy the plants including the fruit; ensure subsequent generations are destroyed; and ensure the land is kept free of the plant. A person who deals with a carrier of tropical soda apple must ensure the plant (and any seed and propagules) is not moved from the land; and immediately notify the local control authority of the presence of the plant on the land, or on or in a carrier.	General Biosecurity Duty	 

Scientific Name (Common Name)	State Priority Weed	Reg. Priority Weeds	WoNS	Other Regional Weeds	General Biosecurity Duty	Biosecurity duty prohibition on certain dealings	Biosecurity duty LLS region	Images
<i>Spartium junceum</i> (Spanish Broom)		X					General Biosecurity Duty	 
<i>Tamarix aphylla</i> (Athel Pine)	X					Must not be imported into the state, sold, bartered, exchanged or offered for sale.	General Biosecurity Duty	 

Scientific Name (Common Name)	State Priority Weed	Reg. Priority Weeds	WoNS	Other Regional Weeds	General Biosecurity Duty	Biosecurity duty prohibition on certain dealings	Biosecurity duty LLS region	Images
<i>Tecoma stans</i> (Yellow Bells)				X			General Biosecurity Duty	 

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<i>Thinopyrum junceiforme</i> (Sea Wheatgrass)				X			General Biosecurity Duty	 

Scientific Name (Common Name)	State Priority Weed	Reg. Priority Weeds	WoNS	Other Regional Weeds	General Biosecurity Duty	Biosecurity duty prohibition on certain dealings	Biosecurity duty LLS region	Images
<i>Ulex europaeus</i> (Gorse)		X				Must not be imported into the state, sold, bartered, exchanged or offered for sale.	Riverina: Regional Recommended Measure* (for Regional Priority - Eradication) Land managers should mitigate the risk of the plant being introduced to their land. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant. Notify local control authority if found. Your local biosecurity weeds officer can help to identify, advise on control, and how to remove this weed. South East: Regional Recommended Measure* (for Regional Priority - Containment) Whole of region: Land managers mitigate the risk of new weeds being introduced to their land. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant. Within exclusion zone: Land managers should eradicate the plant from the land and keep the land free of the plant. Notify local control authority if found. Within containment zone: Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value. Land managers should mitigate spread of the plant from their land.	 

Scientific Name (Common Name)	State Priority Weed	Reg. Priority Weeds	WoNS	Other Regional Weeds	General Biosecurity Duty	Biosecurity duty prohibition on certain dealings	Biosecurity duty LLS region	Images
<i>Xanthium occidentale</i> (Noogoora Burr)	X						General Biosecurity Duty	 
<i>Xanthium spinosum</i> (Bathurst Burr)	X						General Biosecurity Duty	 

APPENDIX E: SUPPLEMENTARY HOLLOW AND NEST STRATEGY

HumeLink East



Supplementary Hollow and Nest Strategy

HLE-AGJ-ENV-ALE-PLN-0000-00004 | Rev 02

I. APPROVALS

	Name	Signature	Date
Author:	[REDACTED]	[REDACTED]	11/08/2025
Sponsor:	[REDACTED]	[REDACTED]	11/08/2025
Project Director:	[REDACTED]	[REDACTED]	11/08/2025

The authorised use of this document shall only be once approved by way of presence of signatories under section above.

II. DOCUMENT CONTROL – REVISION HISTORY

Rev	Date	Pages	Revised by	Description
A	16/01/2024	All	[REDACTED]	For submission to Transgrid
B	3/04/2024	All	[REDACTED]	For submission to Transgrid
C	15/07/2024	All	[REDACTED]	Updated for Amendment Report and Revised BDAR. For submission to Transgrid
D	14/08/2024	All	[REDACTED]	Update to address Transgrid comments
00	19/08/2024	Nil		IFU
01.1	29/11/2024	All	[REDACTED]	[REDACTED] address Transgrid Additional Ecological Surveys Briefing Note and BCS Comments
01.2	14/04/2025	All	[REDACTED]	Updated to address BCS and ER comments.
01.3	13/06/2025	5	[REDACTED]	Updated to address CPHR comments.
01.4	11/08/2025	Various	[REDACTED]	Updated to address CPHR comments.
02	15/09/2025	Nil		Issued for Use

GENERAL REQUIREMENTS

The Project Director is responsible for the distribution of this Management Plan. The controlled master version of this document is available for distribution as appropriate and maintained on RIB | CX. All circulated hard copies of this document are deemed to be uncontrolled. The implementation of this Management Plan is under the authority of AGJV and the Project Director. All personnel employed on the Project will perform their duties in accordance with the requirements of this Management Plan, supporting management plans, and related procedures.

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1. INTRODUCTION

This Supplementary Hollow and Nest Strategy (Strategy) is an appendix to the Biodiversity Management Sub-plan (BMP) which forms part of the Construction Environmental Management Plan (CEMP) for the HumeLink East project (the Project). Acciona Genus Joint Venture (AG JV) has been contracted to deliver the Project. Refer to the Biodiversity Management Plan (BMP) for the glossary, references & compliance against relevant Conditions of Approval (CoA) and Updated Management Measures (UMMs).

1.1 PURPOSE

This Strategy provides for the management of the relocation of fauna habitat and removal and replacement of fauna habitat in accordance with UMM B12 and CoA B30.

This Strategy has been prepared by Principal Ecologists Dr J [REDACTED] (Zoology & Entomology), Hons (Zoology), PhD (Ecology) and [REDACTED] (Biology), Grad. Dip. (Bushfire Protection).

1.2 SCOPE AND OBJECTIVES

This Strategy provides a multi-staged approach to the removal and relocation, replacement, and restoration of habitat features.

The scope of this Strategy is to identify threatened fauna species that are likely to be adversely affected by the Project and to provide:

- A process to identify known locations of hollow-bearing trees and nests (based on the results of subsequent ecological surveys), including characterisation of hollow resources
- A process to identify target locations for artificial hollow installation
- A process to identify the number, type, size, and GPS location of artificial hollows for target species to be installed to compensate for hollow-bearing tree removal
- Methods and procedures for new tree hollow creation, natural tree hollow re-use and nest box installation, including timing and reporting
- Measures to address and manage nests (such as raptor nests) prior to clearing (refer to Appendix B Vegetation Clearing Procedure)

The objective of this Strategy is to assist in mitigating the impacts of clearing required for the Project by identifying target species and prescribing the necessary processes required to install and manage artificial hollows as alternative roosting and/or nesting habitats for threatened fauna displaced during clearing.

All monitoring and reporting required for this Strategy will be undertaken in accordance with Appendix H Flora and Fauna Monitoring Program.

1.3 INDUCTION AND TRAINING

All Project personnel are to be inducted on the existence of this Strategy during the Project Induction and in more detail as required in Site Inductions and regular Toolbox Talks. Records of all training, including inductions, will be maintained. Records will include the name and role of the attendee, the date of training/induction as well as the name of the course.

1.4 ROLES AND RESPONSIBILITIES

The Project Team's organisational structure and overall roles and responsibilities are outlined in Section 3.5 of the CEMP. Specific responsibilities for the implementation of environmental controls are detailed in Table 29 of the BMP.

The Strategy details specific roles include:

- The Project Ecologist who will be engaged to undertake specific works detailed in this Strategy and Appendix H Flora and Fauna Monitoring Plan including pre-clearance surveys, salvage and relocation of fauna habitat and installation and monitoring of artificial hollows.
- An AQ5 Arborist with previous experience in using a Hollowhog will be engaged to directly supervise hollow carving who will be undertaken by suitably skilled personnel.

- Area Manager and/or Environment and Sustainability Manager will be responsible for ensuring best-practice methods are undertaken when relocating woody debris, rocky habitat and other fauna habitat.

1.5 RELEVANT DOCUMENTS, GUIDELINES AND SPECIFICATIONS

Documents and guidelines that are specifically relevant to this strategy include:

- Artificial hollows for wildlife: A practical guide (Franks & Franks, 2011)
- Design guidelines for Hollowhog (access at <https://www.hollowhog.com.au>)
- Characteristics of tree hollows used by Australian birds and bats (Goldingay, 2009)
- The characteristics of squirrel glider (*Petaurus norfolcensis*) den trees in subtropical Australia (Beyer et al. 2008)
- Bat boxes are not a silver bullet conservation tool (Griffiths et al. 2017)
- Chainsaw-carved cavities better mimic the thermal properties of natural tree hollows than nest boxes and log hollow (Griffiths et al. 2018)

2. IMPORTANT HABITAT RESOURCES

2.1 TREE HOLLOWES

The presence of naturally occurring tree hollows in the environment is a critical resource for hollow-dependent fauna. Hollow-dependent fauna are species that are reliant upon hollows as a key component of their habitat either on a daily or seasonal basis.

Hollows provide shelter and refuge from environmental factors such as exposure to predators and the elements. For several species, the availability of hollows that provide security and protection during periods of vulnerability (e.g., hibernation, or bouts of torpor) (Goldingay, 2009). Many species require hollows for breeding (e.g., parrots, microbats, and owls) and populations are often limited by the availability of hollows in an area. Due to large-scale land clearing, the loss of hollow-bearing trees is listed as a key threatening process (NSW Scientific Committee, 2007).

Hollows can be placed into two categories:

1. Hollows - naturally formed hollows in a tree or shrub with a single access point as a hole, crack, or similar entrance (with only minor secondary access points if any) that leads to an internal enclosed space larger than the primary access point. The material surrounding this space is part of a standing tree, either alive or dead
2. Crevices - naturally formed crevices in a tree that consist of a longitudinal space creating a gap that is enclosed on two sides (e.g., tree branch/limb split, large bark breakaway). A crevice may invariably lead to a hollow space but is delineated from the true hollow definition above by its ability to provide habitat for crevice-adapted species such as bats

Hollows are a critical habitat resource for many species that are known (or likely to occur) in and/or near the Project area. Hollow-bearing trees will be removed for this project, which will therefore impact fauna species through:

- Increased competition for roosting and nesting sites
- Increased predation on some species due to lack of suitable shelter
- Decreased breeding rates amongst hollow-dependent breeders such as parrots, owls, cockatoos, and microbats.

2.2 NESTS

Many species invest time and energy to establish nests that are maintained and available over extended timeframes (i.e., many years). For example, whilst many species of nest-building birds will construct new nests in a different location each year, others such as raptors, egrets, and herons construct large platform nests that they may either reuse each year or rotate use with two or three alternative nest sites over multiple years. The Common Ringtail Possum also constructs a nest (or drey) in the absence of hollow-bearing resources.

In the Project area, a range of nests may be encountered including but not limited to:

- Ground nests – plovers and pardalotes (burrows)
- Platform nests – typical of many raptors, ravens, magpies, herons, egrets, ibises, and large honeyeaters
- Cup Nest – typical of robins, woodswallows, fantails and flycatchers
- Mud Nests – typical of welcome swallows, white-winged choughs and apostlebirds
- Dome nests – typical of babblers, fairywrens, grass wrens, and finches found in a range of woodland habitats.

Fauna utilisation of these resources can be categorised as either:

- Primary use - used directly by the bird species that constructed the resource
- Secondary use - opportunistically used by other species, e.g., the Eastern Pygmy Possum will use a range of shelter sites in addition to tree hollows, such as old nests, tree stumps and dense clumps of timber/leaf litter on the ground.

2.3 ROCKY HABITATS

Rocky habitats are important in providing potential sheltering and breeding habitat for fauna, including threatened species and include rocky landscape features in the form of sandstone and/or granite and outcrops, caves, large boulders, cobbles, piled rock, karsts, as well as cliffs and overhangs.

Rocky outcrops provide critical habitat for threatened native reptiles, such as the Striped Legless Lizard and the Pink-tailed Worm Lizard. Karsts and overhangs provide critical sheltering, nesting, and roosting sites for reptiles, as well as many top-order mammalian and avian predators.

Rocky habitats typically provide foraging resources in the form of a sparse scattering of vegetation for herbivores and insects as well as reptile and amphibian prey for mammalian and avian predators. Many fauna species use bushrock for shelter, basking, to hide from predators, find food and avoid extreme weather.

Rocky habitats can provide nesting habitats in overhangs and caves used by Fairy Martins (*Petrochelidon ariel*), Superb Lyrebirds (*Menura novaehollandiae*) and sometimes avian predators such as Masked Owls and Sooty Owl. Suitable cave habitats can be used for breeding by threatened bat species such as Large-Eared Pied Bat, Large Bent-winged Bat and Little Bent-winged Bat.

2.4 WOODY DEBRIS

Woody debris consists of trees and wood, whether living or dead. Woody debris is defined as pieces of wood at least 100 millimetres in diameter and at least 500 millimetres long (Gibbons et al. 2005). Dead wood and dead trees provide essential habitat for a wide range of native fauna and are important to the functioning of many ecosystems.

2.5 THREATENED SPECIES PRIORITISATION

The loss of hollow-bearing trees poses a threat to hollow-dependant fauna species. However, this threat is increased for threatened species, as their abundance and/or distribution may already be restricted, so they are particularly vulnerable to further threatening processes.

Consequently, hollow-dependant threatened species known to occur in the Project area have been considered priority species for compensatory/supplementary hollows where they are known or considered likely to occur.

3. PRE-CLEARANCE SURVEYS

During pre-clearing surveys, the Project Ecologists will survey and document the distribution and density of habitat trees, nests, karst roosting habitat, Key Fish Habitat and habitat features such as bush rock, coarse-woody debris within the proposed clearing extent as outlined in Appendix B Vegetation Clearing Procedure. Impacts on habitat trees, rocky habitats, and other habitat features will be avoided and minimised where possible through detailed design and micro-siting.

3.1 HOLLOW-BEARING TREES

Hollow-bearing trees (HBTs) are defined as those trees that have at least one crevice suitable for microbats or one hollow. A tree is considered to contain a hollow if:

- The entrance can be seen
- The hollow appears to have depth (i.e., solid wood cannot be observed beyond the entrance)
- The hollow was at least 1m above the ground.

A precautionary approach will be used when identifying HBTs; where a hollow is suspected, it will be assumed present and recorded. Hollows in fallen trees will be inspected for signs of use including scratch marks, chewed bark, scats, fur, feathers, nesting material, eggs/eggshells, or young. Any tree with hollows with evidence of prior occupation or currently occupied need to be replaced. Where evidence is inconclusive, the precautionary principle will apply, and the hollow replaced.

For each hollow-bearing tree identified, the following hollow details will be recorded:

- Number of each hollow class (small <5cm, medium 5-15cm, large 15-25cm and extra-large > 25cm)
- Suitability and hollow activity (a precautionary approach will be taken, and all hollows will be treated as occupied unless confirmed otherwise).

An accurate account of all HBTs, including number and size, will be determined during pre-clearing surveys. Each HBT will be mapped using a hand-held GPS unit, marked (using a tree tag and number) and spray painted with the capital letter H in a circle on multiple sides so visible from all angles and/or wrapped with highly visible flagging tape for future identification.

Where possible, removal of HBTs will be avoided. To assist with this, highly visible barriers, or demarcation, in the form of fencing, star pickets or pegging with tape such as colour-coded UV-stabilised rope, bunting, nightline, or other similarly robust and durable materials will be used, around the drip line where possible, to notify construction personnel of their presence and the need for impact avoidance. Where retention is achievable, Environmental Control Maps (ECMs) will be updated to include habitat tree locations as biodiversity exclusion zones and communicated during toolbox talks. ECMs will be stored and displayed onsite with copies provided to Supervisors as detailed in the CEMP.

The number and size of hollows to be removed during clearing will be used to inform the number and type of artificial hollows required to be installed in the surrounding areas (refer to Section 5).

3.2 NEST IMPACT MANAGEMENT

During pre-clearing surveys, potential nests will be identified by the Project Ecologists within the disturbance area. The survey will aim to identify and locate, where possible, all potential nests within the disturbance area. Each nest identified will be mapped using a hand-held GPS unit and marked using spray paint in the form of a capital letter H in a circle on multiple sides so visible from all angles and/or wrapped with highly visible flagging tape for future identification.

Potential nest types have been identified in Section 2.2 of the strategy. Methods employed in the management of nests can be summarised by the following:

- Identified active nests are either to be avoided (where practical) or managed in accordance with the Fauna Handling and Rescue Procedure (Appendix C)
- Where active nests or nesting material can be successfully relocated, locations are to be determined by the Project Ecologist.

3.3 SALVAGING HABITAT RESOURCES/FEATURES

It may be feasible for habitat resources and features to be salvaged and retained for fauna use within the general area. Resources such as nests, , ringtail possum dreys, instream habitats (snags, boulders etc.) and natural hollows that remain intact during clearing and features such as woody debris, bush rock, dead wood, logs, rock piles, rocky outcrops, surface rock and timber piles may be able to be installed in adjacent habitats and within the transmission line easement where practicable. Opportunities to retain felled trees as habitat on easement will be considered in select areas such as connectivity corridors and riparian lands.

During pre-clearing surveys, all potential fauna habitats to be impacted (e.g., woody debris, bush rock, and instream habitat) will be identified and mapped using a hand-held GPS unit per Appendix B Vegetation Clearing Procedure. Information on the distribution and density of habitat will be used to inform its relocation within the transmission line easement where practicable or into surrounding areas.

Trees within the boundaries of State forests, Crown Lands, Travelling Stock Reserves, public roads or within 40 m of the bank of any river will be disposed of strictly in accordance with the requirements of the appropriate authorities as per UMM B19.

Where appropriate, salvaged timber (with due consideration given to fire management requirements) will be utilised in accordance with UMM B3, UMM B19 and CoA B30.

4. RELOCATION OF FAUNA HABITAT

Relocation of fauna habitat, such as dead wood, dead trees, rocky outcrops, surface rock, bush rock, tree hollows, logs and cleared/ felled tree trunks (especially those greater than 10 cm in diameter and at least 0.5 m long) will be undertaken, where practicable, within the transmission line easement or in adjacent vegetated areas and/or suitable vegetated locations that will not be impacted as agreed by with landowners. Opportunities to retain felled trees as habitat on easement will be considered in select areas such as connectivity corridors and riparian lands. Foliage, thin branches, and root balls are of less value for habitat, however, in accordance with UMM B19, consultation with local Councils and other organisations (including NPWS, Local Land Services, local Landcare groups, DPI Fisheries) regarding their use will occur prior to exploring disposal methods, such as mulching for soil restoration works.

Habitat items will be relocated to 'recipient sites' that form the same, or similar, vegetation community as the location of origin 'donor site' and in a manner sympathetic to the requirements of native fauna, as far as reasonably practicable. A detailed register will be kept for all salvaged habitats including type of habitat feature, target species or species group, and location of installation at the recipient site.

4.1 RELOCATION OF WOODY DEBRIS AND ROCKY HABITATS

Woody debris is used by a suite of fauna and can be classified into sizes based on potential fauna habitat uses (refer to Table 1 for details). Rocky habitats are important in providing potential sheltering and breeding habitat for fauna.

The Project Ecologist will provide advice on the reuse of woody debris and rocky habitats remaining in situ within partial direct impact zones and transmission line easements, where practicable, or relocation sites to ensure it does not have a negative impact on the receiving environment. In existing areas of high-quality habitat, there may already be enough suitable woody debris and/or rocky habitats, where adding surplus woody debris and/or rocky habitats may cause unnecessary disturbance or a fire hazard. If relocation of woody debris is not feasible, recycling of stems, branches, trunks, etc. of native trees greater than 25cm in diameter for use as fencing materials, firewood or other appropriate uses may occur.

Where possible, any remaining native vegetation not used as fauna habitat will be mulched and stockpiled within the development footprint to minimise environmental impacts and used during site restoration. However, native vegetation showing any sign of disease or pathogen will not be mulched, stockpiled, and/or re-used on site. Any diseased or pathogen-affected vegetation will be removed offsite to an appropriately licensed facility.

Table 1 Classification of woody debris and possible uses.

Size	Possible Uses
Logs >500mm in diameter	Habitat improvements, such as re-snagging creeks and rivers (in consultation with DPI).
Logs >100mm in diameter	Erosion and sediment control, replacement of habitat features, habitat improvement (e.g. perching sites for woodland birds, timber piles for reptiles and frogs).
Logs <100mm in diameter	Dead wood, dead trees, fallen logs and cleared tree trunks <100mm in diameter should be mulched and stockpiled.

4.2 FAUNA HABITAT TRANSPORTATION AND PLACEMENT

The transportation and placement of fauna habitat will depend on the amount and size of selected fauna habitat to be relocated and is to be undertaken with the advice of the Project Ecologist who has a minimum of 3 years' experience and a relevant environmental qualification. Pre-clearing survey reports will include the description and photographs of identified fauna habitat.

The Area Manager and/or Environment and Sustainability Manager will ensure the following best-practice methods are undertaken when relocating woody debris, bush rock, and other fauna habitat:

- Removal, stockpiling, transportation, and relocation of woody debris and rocky habitat will be carried out in a manner that minimises disturbance to native vegetation, including the canopy, shrubs, dead trees, fallen timber and groundcover species

- The spread of any weeds or pathogens that may be in the soil will be avoided when relocating woody debris and bush rock from stockpiles
- The Project Ecologist will provide advice on positioning fauna habitats such as woody debris and bush rock in designated relocation areas
- Vegetation will not be cleared, and trees will not be felled to place habitat in a wooded area. If habitat cannot be easily placed in an area without clearing trees or shrubbery, an alternate recipient site will be sought
- Topsoil disturbance will be kept to a minimum and will not be heaped up against woody debris and bush rock because of the potential to provide habitat for rabbits
- Woody debris and bush rock will be placed appropriately for the target species as dictated by the Project Ecologist.

4.3 STOCKPILING FAUNA AND AQUATIC HABITAT FOR RE-USE AND RESTORATION

Habitat features and resources will be stockpiled for later reuse where practicable. Stockpiling will be undertaken in line with Project stockpiling requirements and locations marked on ECMs.

Where possible, hollows removed from within the site will be stockpiled prior to construction works. Once stockpiled, hollows will be left untouched. If stockpiled for over one month, an ecologist will conduct a pre-clearing survey on all stockpiles to ensure no protected fauna species have reoccupied fauna habitat within the stockpile. A suitably qualified ecologist will be present during removal, to capture and relocate any occupying fauna.

In consultation with the Project Ecologist and DPI Fisheries, felled trees, aquatic woody debris, boulders, and root balls salvaged during clearing activities will be temporarily stockpiled and where appropriate and practicable, be used in the restoration of the banks of rivers, watercourses, KFH rehabilitation or improvement work at locations where scour risk and risk of dislodgment and downstream damage can be avoided. Waterway bed and bank material excavated during construction will be stockpiled outside of the active channel and avoid riparian vegetation. Any material excavated from the instream work sites, such as coarse woody debris or boulders, will be temporarily stockpiled separately from other materials during construction and returned to the waterway bed following the completion of construction work at locations where scour risk can be avoided and risk of dislodgment and downstream damage.

5. REPLACEMENT ARTIFICIAL HOLLOW STRATEGY

The habitat replacement measures for the Project include the following:

- Installation of carved hollows in existing trees to be retained by a Hollowhog tool or similar method which does not require the use of a chainsaw
- Reuse of existing hollows salvaged prior to or during clearing operations
- Replacement of habitat features (roosting habitat) in man-made structures (culverts, bridges etc.) in suitable areas
- Installation of artificial hollows including Goldilocks boxes.

Fauna habitat replacement requirements will be determined for the Project in a staged approach once pre-clearance surveys and detailed design have been completed, and construction methodologies have been confirmed. The use of artificial hollows will include a range of hollow sizes (e.g., small, medium, and large) and reflect the natural range and density of hollow sizes recorded in the clearing extent.

Targeted threatened species for the replacement habitat relocation strategy are provided in Table 2.

Table 2 Targeted threatened species for replacement habitat (hollows).

Scientific Name (Common Name)	BC Act	EPBC Act	IBRA Subregion	Occurrence	Hollow Size
Birds					
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
			[REDACTED]	[REDACTED]	
			[REDACTED]	[REDACTED]	
			[REDACTED]	[REDACTED]	
			[REDACTED]	[REDACTED]	
			[REDACTED]	[REDACTED]	
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
			[REDACTED]	[REDACTED]	
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
			[REDACTED]	[REDACTED]	
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
			[REDACTED]	[REDACTED]	
			[REDACTED]	[REDACTED]	

Scientific Name (Common Name)	BC Act	EPBC Act	IBRA Subregion	Occurrence	Hollow Size
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]					
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
			[REDACTED]	[REDACTED]	[REDACTED]
			[REDACTED]	[REDACTED]	[REDACTED]
			[REDACTED]	[REDACTED]	[REDACTED]
			[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
			[REDACTED]	[REDACTED]	[REDACTED]
			[REDACTED]	[REDACTED]	[REDACTED]
			[REDACTED]	[REDACTED]	[REDACTED]
			[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
			[REDACTED]	[REDACTED]	[REDACTED]
			[REDACTED]	[REDACTED]	[REDACTED]
			[REDACTED]	[REDACTED]	[REDACTED]
			[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
			[REDACTED]	[REDACTED]	[REDACTED]
			[REDACTED]	[REDACTED]	[REDACTED]
			[REDACTED]	[REDACTED]	[REDACTED]
			[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
			[REDACTED]	[REDACTED]	[REDACTED]
			[REDACTED]	[REDACTED]	[REDACTED]
			[REDACTED]	[REDACTED]	[REDACTED]
			[REDACTED]	[REDACTED]	[REDACTED]

5.1 ARTIFICIAL HOLLOW INSTALLATION TIMING

Artificial hollow installation will be staged with clearing. Hollow counts will be undertaken during pre-clearing surveys as per Section 3.1.

Appropriately sized artificial hollows will be installed within the vicinity of hollow-bearing trees as close to the cleared area as possible (subject to landowner agreement and suitable trees being present) and as early as practicable prior to clearing activities to prevent the use of the nest boxes or hollow replacements by invasive or non-targeted species.

The project will install 30% of the required artificial hollows, at a particular location, subject to landowner agreement and suitable trees being present unless otherwise agreed with CPHR, prior to clearing within

a designated area, particularly in hollow deficit areas and in priority locations such as wildlife and connectivity corridors. During clearing works, a refined hollow count of existing hollows that meet the NSW BAM defined hollow definition, as well as fauna occupancy rates, will be undertaken. Hollows in fallen trees will be inspected for signs of use including scratch marks, chewed bark, scats, fur, feathers, nesting material, eggs/eggshells, or young. Any tree with hollows with evidence of prior occupation or currently occupied need to be replaced. Where evidence is inconclusive, the precautionary principle should apply, and the hollow replaced. The refined hollow count will be used to inform the total number of hollows requiring replacement.

Installation of remaining hollows will commence as soon as possible after clearing completion and be completed within 2 months of clearing at a particular location subject to landowner agreement and suitable trees being present, unless otherwise agreed with CPHR. Exact timing of artificial hollow installation will be provided in the Artificial Hollow Installation Report. Following the completion of construction, artificial hollows will remain in place and will not be removed and therefore remain post-construction.

5.2 INSTALLATION OF ARTIFICIAL HOLLOWES

Replacement artificial hollows (e.g., carved hollows, re-used hollows, artificial hollows) will be installed in suitable areas as close to the cleared area as possible (subject to landowner agreement and suitable trees being present). Suitable habitat will be within the locality and where existing hollows are limited (specific to the size of replacement hollow).

The number of replacement hollows in each area will be determined in consultation with Transgrid as per the process outlined in Section 5.1 and with consideration of the factors listed in Section 5.4 of this Strategy.

Hollow data collected by the Project Ecologist during pre-clearing surveys (Section 3.1) will be compared to species-specific artificial hollow dimensions to help determine the quantity of artificial hollows and specific types. The target species, size, total number and type of replacement hollows that are required to be installed as well as suitable locations for artificial hollow installs will be determined based on the results of the surveys undertaken by the Project Ecologist and active hollow resources in adjacent areas.

A detailed register will be maintained for artificial hollows as described in Section 5.5.

Table 3 shows hollow requirements for each species.

Table 3 Recommended artificial hollow dimensions for species groups (based on Nest Boxes for Wildlife 2011). To be used as a guide.

Target species groups/artificial hollow type	Entrance diameter (mm)	Internal dimensions (mm)	Depth/ height of chamber (mm)	Height above ground (m)	Spacing between the same type of artificial hollow (m)	Additional comments
Microbats	Various slot sizes	N/A	400 or 600	1.8-5	50	Bottom opening; hang shade cloth or denim inside
Small birds	50	150 x 150	30	3-6	50	Horizontal spout entrance
Parrots	30-50	150 x 200	400	2-4	50	Front entrance
Cockatoo/ Large owls	200	300 x 400	1200	8-10	200	For cockatoos - Very heavy chewer; angled spout entrance
Small gliders	25	150 x 150	300	3-6	60-100	Rear-entry preferred
Medium Gliders	40	150 x 250	300	3-6	60-100	Rear-entry preferred
Large gliders	80-100	250 x 300	300	6-8	180-200	Use thermo-regulated

Target species groups/artificial hollow type	Entrance diameter (mm)	Internal dimensions (mm)	Depth/ height of chamber (mm)	Height above ground (m)	Spacing between the same type of artificial hollow (m)	Additional comments
						nestboxes such as “Goldilocks boxes”. Will use several den sites. Position entrance to face tree.
Possums	100	250 x 250	300	2-4	100	Will use several den sites.

5.2.1 CARVED HOLLOW

Hollows carved into existing live trees using a Hollowhog tool are a viable option for replacing lost tree hollows. Carved hollows may offer a range of improvements over traditional nest boxes including a more suitable microclimate, greater longevity, less maintenance and fewer visual impacts (Ruegger 2017; Griffiths et al. 2018). Literature on species utilisation is still growing and the impact of the hollow on recipient tree health is not well documented. Long-term maintenance requirements are also not well known, as studies (Terry et al. 2021) have identified that carved hollows are vulnerable to a build-up of moisture from water ingress and trees can heal hollow entrances over time (Figure 8.4). Carving also exposes the tree to disease and termites (Terry et al. 2021).

The Hollowhog tool efficiently and safely creates large internal cavities through small entry holes in both living and dead wood. The Hollowhog creates a 50mm entry hole and then progressively carves a larger and larger hollow of any dimensions up to about 600mm wide and long by 600mm deep. The hollow shape can be easily adapted to the size and shape of the tree limb or trunk that it is being carved in. The entry hole size and shape can be targeted to almost any fauna species by either carving a larger entry hole or adding entry modifiers to reduce the size back down to as small as needed. Further design guidelines can be found at Hollowhog (access at <https://www.hollowhog.com.au>).

The Project Ecologist, in consultation with Transgrid, will identify suitable trees for the installation of a carved hollow. Hollow carving will be undertaken by suitably skilled personnel under the direct supervision of an AQF Level 5 arborist with previous experience in using a Hollowhog. The Project will review the experience of any arborist prior to engagement for hollow carving to determine whether the arborist has sufficient experience to undertake the works with minimal risk of causing permanent damage to trees.

5.2.2 RE-USE OF HOLLOW

Natural hollows in trees removed during clearing operations can be retrieved and re-attached to suitable trees in recipient sites. Since these hollows are naturally formed, they are more likely to create a favourable environment for specific target species compared to traditional artificial hollows, especially if that species has already been identified using the hollow intended for salvage. This method is most suited to small and medium-sized hollows that occur in limbs, owing to the relative ease of collection (cutting the limb on either side of the hollow with a chainsaw). Hollows selected for re-use should be a minimum of 500mm in length.

Where possible, salvaged hollows should be capped on either end with a polyvinyl chloride (PVC) plate and should be positioned securely in the fork of a recipient tree. If this is not feasible, the salvaged hollow should be attached using the Habisure System employing appropriately selected material to not damage the recipient tree. Materials may include rope, wire and/ or galvanised builders strapping. The strapping should not be tightly wrapped against the recipient tree as this will restrict the flow of water and nutrients through the cambium, particularly as the tree grows and the strapping tightens. A living tree trunk should never be punctured with galvanised or copper nails/ screws to secure an item, such as a salvaged hollow, as it is likely to harm or even kill the tree.

Hollows salvaged for relocation and installation as arboreal habitat should be filled to approximately 2 cm with natural nesting material sourced from the surrounding area and placed inside the hollow.

Relocation of the hollows will be undertaken with the assistance of the Project Ecologist. Remounted hollows will be inspected annually to check the adequacy of the mountings and corrected if necessary.

Advantages to re-using tree hollows include:

- Closer resemblance to natural hollows (including microclimates) (Beyer et al. 2008; Griffiths et al. 2017; Ruegger 2017; Griffiths et al. 2018)
- Greater longevity than artificial hollows (e.g., Harley 2006; Beyer et al. 2008; Ruegger 2017)
- Ability to maintain the natural hollow density and type within an area and can be installed at the same aspect and angle due to the individual features of natural hollows that cannot be replicated with a nest box
- Greater attractiveness for a larger array of hollow-dependant species (Ruegger, 2017).

Challenges to re-using tree hollows include:

- Labour intensive without an established and efficient workflow
- Limited to larger tree dimensions that introduce high operational risks
- Large sizes often require the use of elevated work platforms which are limited by location
- Drying out and cracking – the hollow microclimate changes when a live hollow is reused
- A repurposed limb is much heavier than a nest box and the weight of a repurposed limb is a limiting factor for effective installation, cost, and safety considerations.

This technique is to only be used following an assessment of associated environmental constraints, and safety risks and on a case-by-case basis.

5.2.3 NEST BOXES

Nest boxes will be sourced from a reputable manufacturer with demonstrated experience in creating quality products and installed under the guidance of the Project Ecologist. Studies have shown that traditional nest boxes have poor thermal insulation and often reflect ambient conditions, which may result in large daily fluctuations in temperature (McComb et al. 2021) and low humidity (Strain et al. 2021). Design of nest boxes should therefore incorporate measures to reduce large temperature fluctuations (Ellis et al. 2021; Rowland et al. 2017). Thermal influence can be reduced by using thicker walls and light-coloured materials/paint and avoiding metal lids or plates on the roof of the nest box lid. Thermoregulated boxes, such as “Goldilocks” boxes, should be used for larger glider species.

Guidelines for nest box design include:

- Materials used for constructing nest boxes can be varied, though the recommendation is:
 - Exterior grade (marine glue) plywood or high-density polyethylene (longer lifespan, over 30 years)
 - Minimum thickness of 30mm to ensure adequate insulation
 - All fasteners used in nest box construction are weather-resistant stainless steel or galvanised
- The lid should overhang the front and sides of the nest box by at least 25mm to prevent water damage
- A hinged lid is recommended for monitoring and maintenance purposes
- Three small holes should be drilled into the base of the nest box to assist with drainage
- Non-toxic wood shavings should be placed into possum, glider, and bird nest boxes to simulate decaying hollows and provide insulation
- Rough-sawn timber or grooves cut into the face of the box allow animals to grip the box. The grip should also be considered inside the box, either with mesh or grooves cut into the walls, to allow young to climb out of the box
- To minimise the risk of uptake of pest species, rear openings are recommended for glider boxes
- A nest box identification number should be placed on the nest box (stamped on the side or bottom of the nest box) and on the host tree using a permanent form of tagging (aluminium tag drilled into the tree at eye level).

Nest boxes are to be specifically designed and selected for the target fauna species/groups identified in Table 2 with nest box dimensions detailed in Table 3 informed by Franks and Franks (Nest boxes for

Wildlife, 2011) and relevant literature. A unique nest box identification number will be placed on the nest box (stamped on the side or bottom of the nest box).

There is significant ecosystem value in the retention of habitat features suitable for common species. Other commonly occurring non-threatened fauna perform important ecosystem functions such as pollination, seed dispersal, invertebrate control and provide foraging resources for threatened species (e.g., small mammals for the Barking Owl).

The Project should aim to maintain the availability of habitat for these species to support ecosystem functionality. As such, the nest boxes for common species identified for the Project area are also recommended. If the target species' nest boxes in an area are saturated (i.e., at or above those removed from the disturbance), common species can be accommodated by using other nest box design types. This will be determined during and post-clearing stages for nest box installation. Where there are fewer nest box sites, priority box type should be given to threatened species.

Nest box design considerations for target fauna species are outlined in Table 4.

Table 4 Nest box design considerations for target fauna species/groups.

Design theme	Component	Applicable taxa	High-level design considerations
Entrance holes	Size	All species	The entrance hole should be no larger than that required for the target species. This will reduce the uptake by unwanted species. This will be specified for microbats.
	Location	Selected species	The entrance hole should generally be positioned toward the top of the nest box, so the area remains dark.
	Location	Ducks Kookaburra	Entrance hole close to the base of the box.
	Location	Arboreal mammals Microbats	Rear/side entrances should be used for possums and gliders adjacent to the trunk/branch to encourage target species.
	Location	Microbats	- Entrance gap located at bottom of the box to avoid competition with other species. - Gap size applied to include/exclude target microbat species.
Box access	Exterior	All species	- Provision of design to provide grip for target animal access. - May include grooves cut into rough-sawn timber or grooves cut into the face of the box to allow animals to grip the exterior of the nest box.
	Interior	All species	- Provision of design to provide grip for target animal access. - May include mesh or grooves cut into the walls to allow young to climb out of the box.
Furnishings	Internal	All species	- Where appropriate (depending on the target species), wood shavings may be added to each box. - Wood chips, wood shavings or sawdust can be placed into boxes to replicate the inside of decaying hollows and to provide extra insulation.
	Internal	Microbats	- Shade cloth or similar material, and/or timber grooving should be installed in bat boxes to give the bats something to cling to. - Ensure that the material/method selected does not bind/catch toes and legs.
Thermoregulation	Roof/lid	All species	To prevent temperature extremes inside the nest box, do not use metal lids or plates on the roof of the nest box.

Design theme	Component	Applicable taxa	High-level design considerations
	Material	All species	- All milled timber uses should be at least 25 mm thick. - If plywood is used it must be a minimum 15mm thick or larger (exterior grade).
	Microclimate	Microbats	- Internal box space should consist of at least 2 compartments (using baffles) to promote microclimate stability. - Larger boxes should incorporate additional baffles/compartments
General design	Roof/lid	All species	- The lid should overhang the front and sides of the nest box by at least 25 mm to prevent water damage - Consideration should be given to drip lines
	Joinery	All species	- Joins should be sealed to reduce drafts and provide structural integrity (may also require the use of screws or nails depending upon the material used) - Screws and/or nails should be inert and/or exterior grade (coated or similar) - Galvanised fittings can be used however they can chemically react with tree fluids
	Finishing	All species	There should be no sharp edges or exposed screws or nails
	Material	All species	- Timber is the preferred material for the construction of the body of the nestbox due to better thermal mass properties - Ideally constructed using durable hardwood that is either recycled or sustainably sourced plantation timber - If not constructed of hardwood, exterior grade plywood is recommended (preferably with FSC certification) - MDF or chipboard should not be used.
	Weatherproofing	All species	- If the boxes are to be painted on the outside then the paint should be non-toxic, neutral-coloured, exterior grade water-based acrylic paint - Excessively dark colours increase nest box temperatures, so are not recommended - The inside should be left natural (i.e., not be painted or treated with oil)
	Drainage	All species	Small drain holes should be placed in the box (in the bottom panel) to allow water to drain
Mounting	Installation	All species	- Method of installation should minimise damage and/or impact to the host tree - Method of installation should allow for growth of the tree with only periodic adjustment/maintenance to mounting to accommodate this growth without nest box or tree failure
	Maintenance	All species	Nest boxes must be mounted in a way that allows for the removal of the nest box for maintenance and/or replacement as required without subsequent damage/impact to the host tree
Toxicity	Weatherproofing	All species	Where possible glues, paints/finishings in nest box construction should exclude the use of products containing Volatile Organic Compounds

Design theme	Component	Applicable taxa	High-level design considerations
			- Oil-based paints and varnishes should not be used to finish the nest boxes - Do not use treated materials.
Pest management	Control	All species	- As required, anti-pest devices such as buffalo fly ear tags should be installed to deter European honeybees in areas where they could become a problem - Some success has been found with the use of artificial grassmounted on the internal side of the roof, and similarly using recycled plastic for lids to deter the establishment of European Honeybees

5.3 HOLLOW INSTALLATION PROCEDURE

The Project Ecologist will be on-site during the installation of artificial hollows to provide advice on attaching them to trees/structures, including their height, location, and orientation. Artificial hollows will be installed in trees (both rough-barked and smooth-barked eucalypts) that do not already have hollows of the same size.

The attachment method is a key factor in determining the lifespan of an artificial hollow (Goldingay 2019a). All nest box attachment methods should prioritise allowing for tree growth, as this is a common reason for nest boxes falling from trees. The attachment method must be suitable for each type of artificial hollow and should consider location-specific factors.

The preferred method of attaching small to medium sized nest boxes and salvaged hollows to trees is the Habisure system (Figure 1). This method allows for tree growth and minimises damage to the tree, however, can have problems, such as causing artificial hollows to tilt on smaller trees, and over time, the wire may lose its flexibility. Hanging the artificial hollow from a very large (~150mm) galvanised nail inserted into the tree at an angle allows the hollow to shift gradually along the nail as the tree grows. While both methods support tree growth, in certain situations, a combination of both techniques may be necessary for long-term stability. The Habisure system involves:

- A length of 3.15mm plastic-coated soft fencing wire will be passed through the artificial hollow and around the tree trunk
- Wire must be folded into at least four folds about 60mm tall and 15mm apart at the sides of the box to allow for tree growth
- Where the wire is in contact with the tree trunk or branch it must be threaded through a length of garden hose to protect the tree
- Where possible the wire around the tree will pass over a branch behind the trunk, although artificial hollows can be installed directly on a straight-stemmed tree
- Details of each artificial hollow will be recorded and include the GPS location, identification number, artificial hollow type, and diameter at the breast height of the host tree.

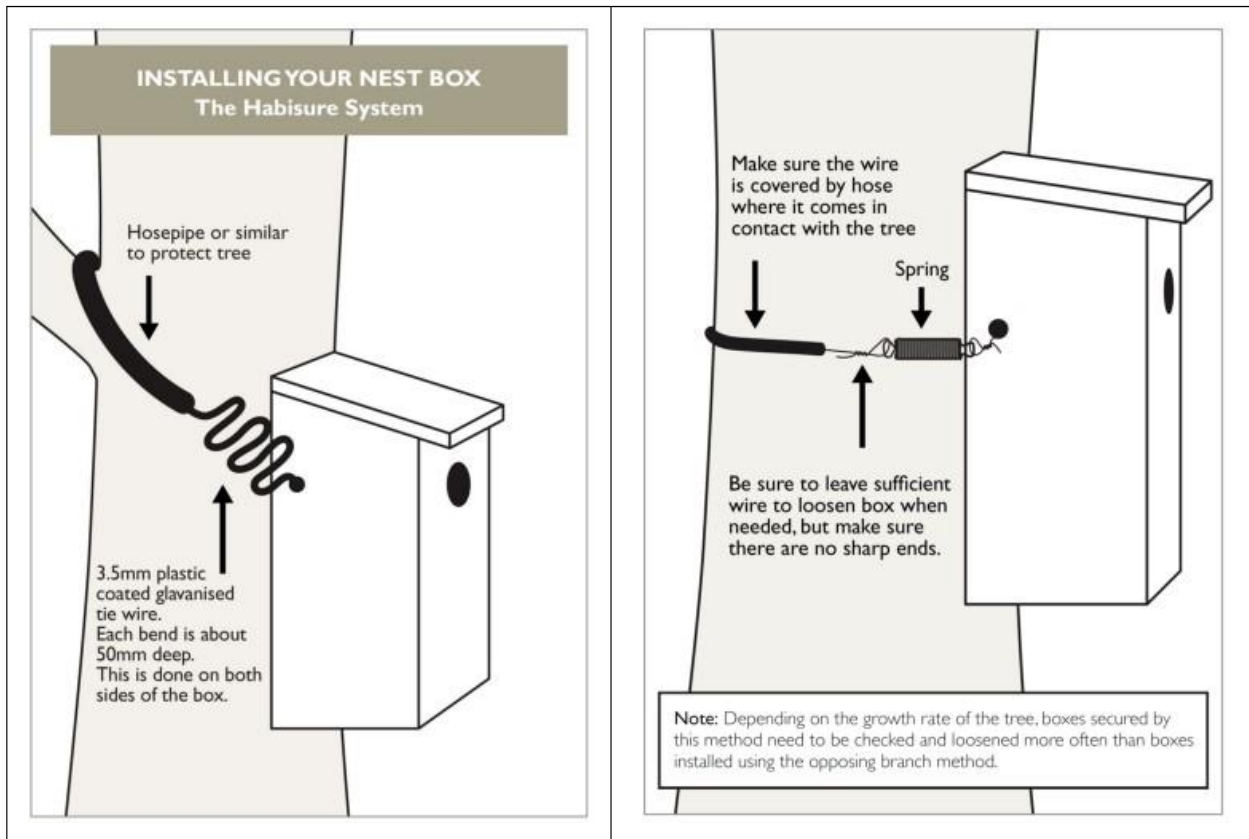


Figure 1 The Habisure © system for attaching artificial hollows to trees.

Installation of medium to large, salvaged hollows is likely to incur higher costs compared to other methods as it involves the use of equipment for transporting large tree sections, such as cranes and semi-trailers, as well as hiring of arborists. Manoeuvring salvaged hollows requires adequate space and there are potential safety risks if not attached securely. Heavy-duty attachments are necessary to secure large logs, branches or tree trunks to a host tree. Importantly, the chosen attachment method should accommodate for tree growth.

Each artificial hollow installed will be labelled to aid in monitoring and the following information will be summarised and included in the Artificial Hollow Installation Report.

- Artificial hollow identification number
- Artificial hollow type
- Artificial hollow height and orientation
- GPS location
- Date of installation.

5.4 LOCATION OF ARTIFICIAL HOLLOWES

The location of the artificial hollows will be determined by the Project Ecologist following the identification of hollow-bearing trees, available nearby habitats and active hollow resources in adjacent areas. Artificial hollows will be installed as close to the cleared area as possible (subject to landowner agreement and suitable trees being present). Should there be no suitable areas and trees adjacent to the site, artificial hollows will be installed at the nearest suitable area. Suitability will be determined by installation guidelines. Spacing of artificial hollows is an important consideration as overcrowding can be counterproductive potentially deterring animals from using them. As such, artificial hollows will be evenly spaced across the target species modelled habitat (refer to species polygon). The Project Ecologist will also determine locations for the re-use of natural tree hollows by placement on the ground to create habitats for ground-dwelling fauna within adjacent vegetation.

The Project Ecologist will be on-site during the installation of artificial hollows to provide advice on recommended installation e.g. tree attachment, suitable height, density, location, orientation and timing of artificial hollows. Locations for potential installation areas will be considered in order of preference:

1. Within the easement where trees are retained in gullies
2. Within wildlife or connectivity corridors
3. Adjacent to the Project site, with landowner agreement to access installation and ongoing monitoring in biodiversity offset sites.

The distribution of artificial hollows across the landscape will be determined with consideration of the following:

- a) Installing artificial hollows as close as possible to the location of the original hollow-bearing tree (where feasible within 100m from the point of resource removal)
- b) Estimated number of hollows already occurring in the proposed installation site
- c) Placement according to landscape need, not based on land availability (i.e., to reflect the abundance of natural hollows in the vicinity and/or to utilise areas that contain other resources but are lacking hollows)
- d) Placement in specific areas to facilitate wildlife connectivity across the landscape
- e) Positioning in habitat locations where sufficient cover is present to avoid exposure to the elements and predators
- f) Place in areas of native vegetation ideally connected to other areas of native vegetation, away from threats from roads and domestic animals
- g) Average carrying capacity for hollow-dependant species
- h) The target species behaviours (e.g., spacing artificial hollows for a territorial species greater than the home range distance to reduce inter-specific and intra-specific competition spacing of the artificial hollows in relation to the target species' natural home range - overcrowding can be counterproductive and has the potential to deter animals from using an artificial hollow)
- i) Availability and suitability of other resources such as water and food of the target species.

The following in-principal considerations will apply when determining trees for artificial hollow installation:

- Place artificial hollows at varying heights according to the recommended height for the target species (Table 3)
- Install artificial hollows for gliders and possums on rough-barked trees, e.g. stringybark species, can provide nesting material and foraging resources (Goldingay et al. 2020b)
- Artificial hollows will be positioned on the northwest to east sector of tree trunks to avoid the hot afternoon sun and the predominant aspects of severe storms (but see below regarding microbats). Artificial hollows for gliders may also be installed facing north
- Install artificial hollows for microbats within or adjacent to potential flyways. If a hollow-bearing tree is a suspected *Myotis* roost, install hollows adjacent to the nearest watercourse, creek lines or water sources
- For microbats, consideration is given to installing hollows into a variety of locations to provide several thermoregulatory options to allow for use as both summer and winter roosts. Hollows can be positioned within differing aspects of trees (i.e., one on the southern side of a tree and another on the northern side) and into areas of differing canopy and tree density
- Ensuring that the target species can get access to the entrance e.g., birds like a perch near the artificial hollow
- Clusters should be spaced at least 200 metres apart (100 – 200 metres is suitable where space is restricted), with individual hollows in each cluster installed 30-50 metres apart on different trees.
- Avoid installing artificial hollows on trees with existing hollows as the presence of other hollow-dependent fauna may act as a deterrent or may compete for the next boxes.
- Recipient tree to be considered robust and in good health (i.e., healthy tree canopy and unexposed roots) and without existing hollows
- Recipient tree's suitability for the target species and type of artificial hollow to be installed
- Minimising the impacts on the recipient tree's growth.

It should be noted that many hollow-bearing trees contain multiple hollows of different sizes. As such, several hollows may be placed in suitable trees (depending on tree species and size) where doing so is

considered by the Project Ecologist to be of benefit to fauna. Multiple roost sites can be utilised by a species, with each roost representing different thermal properties.

5.5 ARTIFICIAL HOLLOW INSTALLATION REPORT

The Artificial Hollow Installation Report will be completed within 3 months of installation for a particular location completion and will include the following:

- Artificial hollow identification number
- The number of artificial hollows installed on the Project
- The type of artificial hollows installed
- The location where the artificial hollows were installed (GPS location)
- The artificial hollow height and orientation
- The vegetation community type (PCT)
- The date of installation.

The report will be prepared by the Project Ecologist and spatial data for artificial hollow installation locations will be provided to Transgrid. The above information will also be maintained in a register of artificial hollows for the project. The report and/or register may be provided to relevant agencies upon request.

5.6 ARTIFICIAL HOLLOW MONITORING AND MAINTENANCE

Artificial hollow monitoring and maintenance is detailed in Appendix H Flora and Fauna Monitoring Program.

APPENDIX F: CONNECTIVITY STRATEGY

HumeLink East



Connectivity Strategy

HLE-AGJ-ENV-ALE-PLN-0000-00005 | Rev 00

I. APPROVALS

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Author:	[REDACTED] [REDACTED] [REDACTED] [REDACTED]	[REDACTED]	02/09/2025
Sponsor:	[REDACTED]	[REDACTED]	02/09/2025
Project Director:	[REDACTED]	[REDACTED]	02/09/2025

The authorised use of this document shall only be once approved by way of presence of signatories under section above.

II. DOCUMENT CONTROL – REVISION HISTORY

Rev	Date	Pages	Revised by	Description
A	16/01/2024	All	[REDACTED] [REDACTED]	For submission to Transgrid
B	3/04/2024	All	[REDACTED] [REDACTED]	For submission to Transgrid
C	15/07/2024	All	[REDACTED] [REDACTED]	Update to include Amendment Report and Revised BDAR. For submission to Transgrid
D	29/11/2024	All	[REDACTED] [REDACTED]	[REDACTED] Transgrid Additional Ecological Surveys Briefing Note
E	14/04/2025	All	[REDACTED] [REDACTED]	Updated to address BCS and ER comments.
F	02/05/2025	Various	[REDACTED]	Update to address ER comments
G	24/06/2025	Various	[REDACTED] [REDACTED] [REDACTED]	Update to address CPHR comments
H	29/07/2025	Various	[REDACTED] [REDACTED] [REDACTED] [REDACTED]	Update to address CPHR comments
I	11/08/2025	Various	[REDACTED] [REDACTED] [REDACTED] [REDACTED]	Update to address CPHR comments
J	02/09/2025	Pg. 58	[REDACTED]	Update to address DPHI Comments
00	15/09/2025	Nil		Issued for Use

GENERAL REQUIREMENTS

The Project Director is responsible for the distribution of this Management Plan. The controlled master version of this document is available for distribution as appropriate and maintained on RIB | CX. All circulated hard copies of this document are deemed to be uncontrolled. The implementation of this Management Plan is under the authority of AGJV and the Project Director. All personnel employed on

the Project will perform their duties in accordance with the requirements of this Management Plan, supporting management plans, and related procedures.

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1 INTRODUCTION

This Connectivity Strategy (Strategy) is an appendix to the Biodiversity Management Sub-plan (BMP) which forms part of the Construction Environmental Management Plan (CEMP) for the HumeLink East Project (the Project). Acciona Genus Joint Venture (AG JV) has been contracted to deliver the Project. Refer to the Biodiversity Management Plan (BMP) for the glossary, references & compliance against relevant Conditions of Approval (CoA) and Updated Mitigation Measures (UMMs).

1.1 PURPOSE

This Strategy provides for the management of habitat connectivity issues arising from the Project and the approach for determining the final locations of the proposed mitigation measures to maintain connectivity in areas identified as facilitating fauna movement in accordance with UMM B10 and CoA C30.

This Strategy has been prepared by Principal Ecologist Dr [REDACTED] Sc (Zoology & Entomology), Hons (Zoology), PhD (Ecology) and [REDACTED] BSc (Biology), Grad. Dip. (Bushfire Protection).

1.2 SCOPE AND OBJECTIVES

This Strategy outlines the locations of the proposed mitigation measures identified in Table A24- 10 of the Revised BDAR, in accordance with UMM B10. However, the strategy is not limited to these locations and remains open to refinement through ongoing consultation and field validation. Additional connectivity corridors may be identified post-BDAR, particularly where ground-truthing and detailed design assessments highlight more suitable or effective locations for maintaining fauna movement across the alignment. Locations for connectivity corridors and minimum width requirements will be implemented to maintain connectivity in areas identified as facilitating fauna movement. The connectivity corridor locations have considered to maintain structural vegetation connectivity linking the connectivity corridor with habitat areas on either side of the Project alignment such as large patches of remnant native vegetation, riparian corridors, threatened species habitat or conservation reserves.

Whilst the Project will result in a level of fragmentation, this strategy aims to help maintain functional connectivity between habitats, as a large proportion of vegetation within the alignment will not be completely cleared and/ or left intact.

Measures considered as a part of the Connectivity Strategy that would be further developed during detailed design include:

- Where proposed lines will parallel existing lines, a small deviation of the route to facilitate retention of a vegetated stepping-stone is recommended between existing and proposed lines.
- Restoration of brake and winch sites and access tracks post-construction where they intersect glider corridors
- Installation of under transmission line glider poles where clearing will fragment connectivity of habitat for Threatened glider species.
- Ongoing retention of large trees within Hazard Tree Zones that intersect glider corridors, subject to regular arboricultural assessment and tree maintenance/ pruning to minimise any safety risks.
- Establishment and maintenance of ground corridors for target non-glider species including supplementing ground refugia to provide shelter for ground dwelling species and /or off-ground connectivity for species such as Eastern pygmy possum, Brush-tailed Phascogale and smaller woodland birds.
- Permanent installation of glider poles within determined glider corridors is required

Specifically, this strategy addresses the requirement for a series of connectivity corridors to be established at:

- Key riparian crossings
- Areas of the transmission line joining proposed biodiversity stewardship sites and or conservation reserve estate
- Transmission line structure locations that occur in woodland vegetation at strategic locations (i.e. vegetation corridors with moderate to high landscape connectivity, and with moderate to high levels of fauna activity/ movement).

The goals of the strategy are to:

- Promote gene flow and provide functional crossing opportunities in a fragmented landscape
- Maintain home range movements for individuals and maintenance of landscape connectivity for existing populations for dispersal and breeding.

This strategy has been developed using desktop resources as well as field survey results from the ecological assessments associated with the Revised Biodiversity Development Assessment Report (BDAR).

Table 1 below outlines all relevant CoAs and UMMs associated with this strategy .

Table 1-1. Relevant CoAs and UMMs

CoA/ UMM	Condition description	Where addressed in the document
B30	(v) connectivity strategy for the potentially impacted species identified in the <i>Revised Biodiversity Development Assessment Report</i> (Revision 0, dated 21 June 2024) and a Supplementary Hollow and Nest Strategy;	This strategy
UMM B10	As a part of the BMP (refer to mitigation measure B3), a Connectivity Strategy will be developed in consultation with NSW DCCEEW Environment and Heritage. The core objectives of the strategy will be to outline the final locations of the proposed mitigation measures identified within Technical Report 1 – Revised Biodiversity Development Assessment Report. The Connectivity Strategy will be implemented to maintain connectivity in areas identified as facilitating fauna movement. Consideration of connectivity corridors will occur as a minimum at: • Key riparian crossings. • Areas of the transmission line joining proposed biodiversity stewardship sites (i.e. Donna Valley Biodiversity Stewardship Site) and or conservation reserve estate (i.e. Tarlo River National Park, Bango Nature Reserve, Mudjarn Nature Reserve and Minjary National Park). • Transmission line structure locations that occur in woodland vegetation at strategic locations (i.e. vegetation corridors with moderate to high landscape connectivity, and with moderate to high levels of fauna activity/ movement). The final locations of connectivity corridors and minimum width requirements will be identified. Access tracks will avoid connectivity corridors and favour existing access wherever possible. Construction will avoid and minimise any disturbance of connectivity corridors, where practicable. Connectivity measures such as fauna sensitive structures (i.e. under transmission glider poles), vegetation stepping stones, or reduced clearing will be considered. Glider connectivity opportunities will be considered in at least six locations within the project footprint that align with	This strategy

CoA/ UMM	Condition description	Where addressed in the document
	glider corridors and opportunities identified in the glider memo (Niche, 2023).	
UMM B27	To the greatest extent practicable: • Transmission line structures will be located and constructed to minimise impact to vegetated riparian zones (VRZs) • The final transmission line easement will target narrow crossing points of waterways and riparian areas clear of vegetation. • Shrub or ground stratum native vegetation within vegetated riparian zones will be protected to the greatest extent practicable, with vegetation clearing ideally limited to the tree stratum only, with trunk bases being retained in situ. • Where threatened species are known to occur, work methods will avoid or minimise impacts by limiting clearing wherever possible and delineating their habitat outside the final disturbance area as no-go zones. • Work near waterways will be undertaken to avoid impacts such as herbicide drift/overspray, erosion and damage to the banks. Riparian areas subject to disturbance will be progressively stabilised and rehabilitated. Disturbance of bush rock in riparian areas will be avoided wherever practicable.	Section 4.4 , Table 3-1
UMM B30	The following factors will be considered during the detailed design and micro siting process for waterway crossings to minimise potential impacts to aquatic environments, wherever practicable: • Any existing crossings will be re-used or upgraded in preference to establishing new crossings. • Disturbance to waterways (bed, banks and associated riparian zones), will be avoided or minimised. • The crossing design and construction work sites will minimise disturbance to any native vegetation, including native instream, fringing, and riparian vegetation within the access track alignment. • Waterway crossings will be constructed perpendicular to the flow of the water and be positioned away from channel bends (where erosive forces are typically greatest). Preferably crossings will be located in straight stream sections with well-defined channel geometries and shallow stream gradients, in stable dry reaches. • Micro-siting will avoid direct and indirect (erosion or sedimentation) impacts to riverine features such as riffles and rapids and sensitive habitat features	Table 3-1

CoA/ UMM	Condition description	Where addressed in the document
	(i.e. snags, coarse woody debris, instream macrophytes, boulders). Where instream structures are required, considerations to potential flooding and erosive effects will be made in the design and construction of the crossing.	
UMM B31	Crossing structures will be designed so that the existing nominal flow velocity, low flow conditions and fish passage are maintained wherever possible. This will include the following considerations: • Minimise the impact of essential instream structures by mimicking natural flows (DPI, 2005b). • Following Fairfull (2013), for waterway crossings incorporating culverts, a minimum of 300 mm of water should pool through the structure, with a centrally placed low-flow cell being preferable. In line with Cotterell (1998), it is recommended that flow over or through instream crossing structures are designed such that they maintain water velocity of 0.3 m/s or less, which is likely to facilitate passage for native species of fish (velocities exceeding 1 m/s, are likely to prevent upstream migration of native fish).	Table 3-1
UMM B33	CLASS 1 KFH streams include larger streams supporting more sensitive aquatic habitats, with important function in the landscape and potential habitats for threatened species. As such CLASS 1 streams require additional consideration: • The need for and location of waterway crossings at identified CLASS 1 locations would be confirmed during detailed design by the construction contractors. • Crossing design would preference a single span bridge structure at where practicable (aligning with the recommended crossing types identified by NSW DPI Fisheries for CLASS 1 streams) to avoid instream impacts, particularly within threatened species potential distributions as identified in Table 13-29 of <i>Technical Report 1 – Revised Biodiversity Development Assessment Report</i>. • Consultation should be undertaken with NSW DPI Fisheries (and Commonwealth DCCEEW for Riek's Crayfish, as required) as to crossing designs and the potential occurrence of threatened aquatic species to inform detailed design and survey. Pre-construction survey would be completed at those CLASS 1 streams identified as supporting potential habitats for threatened species at the site of proposed	Table 3-1

CoA/ UMM	Condition description	Where addressed in the document
	new tracks or upgraded tracks (Table 13-29) to determine: • The presence/absence or likelihood of threatened aquatic species occurring • Completion of an updated 7-part test or SIA assessment, as relevant • Determine any additional mitigation measures e.g. timing of works outside the breeding season where possible • Recommendations as to micro-siting and design in order to minimise potential impacts to threatened aquatic species. The survey requirements, procedures for consultation with DPI Fisheries and Commonwealth DCCEEW and processes for reporting and consideration of recommendations into design and construction methods, as relevant, will be included in the BMP (mitigation measure B3).	
UMM B34	In the event that any further or alternative waterway crossings are required in areas mapped as Key Fish Habitat (KFH) or indicative threatened species distribution mapping (DPI 2023a), an aquatic ecological assessment will be undertaken at the proposed crossing location. The assessment approach will be consistent with that used for the EIS and will address any potential impacts to threatened aquatic species or KFH. This assessment may be desktop based if suitable levels of information are available but may also recommend a field inspection if threatened aquatic species or sensitive aquatic habitat features are considered to have a moderate or higher likelihood of occurring, in order to guide micro-siting and design/mitigation measures to minimise impacts to aquatic environments. Further to this, if a waterway crossing at Oolong Creek is required, the waterway crossing will incorporate a fish passage barrier to prevent the upstream incursion of European Carp and Redfin Perch to protect the Endangered Southern Pygmy Perch Population. If the design cannot incorporate an appropriate fish passage barrier, further engagement will be undertaken with DPI Fisheries to confirm alternate measures for implementation.	Table 3-1
UMM B32	Any sections of stream or waterway banks that are impacted or modified by the project will be reformed or remediated to resemble the pre-work condition and form wherever possible or alternatively to a stable design form, as appropriate following the completion of construction work. This may include revegetation to stabilise bank sediments.	Table 3-1

CoA/ UMM	Condition description	Where addressed in the document
	Waterway banks impacted by the project will be reinstated such that bank stability at the crossing location is the same or better than prior to construction. Stabilising materials such as rock armouring, hydro mulch, jute matting, or other suitable geotextile materials may be utilised where necessary. Any temporary stream crossings will be removed and rehabilitated at the completion of their operational use	
UMM B35	In addition to standard erosion and sediment control measures, the following procedures and considerations will be incorporated into construction methodologies for waterway crossings, where appropriate and practicable: • Minimise disturbance to native vegetation, including instream, fringing and riparian vegetation within the updated indicative disturbance area. This may include the demarcation of areas of native vegetation to be retained during work. • Any coarse woody debris or boulders located within instream work sites will be temporarily stockpiled during construction and then returned to the watercourse, at locations where scour risk can be avoided and risk of dislodgment and downstream damage. • Waterway crossing work will be constructed during no or low flow conditions and under calm weather conditions. Work will also be timed to occur outside of any locally high flow periods. • Silt curtains or coffer dams will be deployed around instream work sites where required, to protect against any impacts to water quality or indirect impacts to retained vegetation. These measures will be situated so to avoid blocking fish passage wherever practical and removed as soon as they are no longer required. • Flow diversion measures will be installed on bunded waterway crossings as appropriate or where construction during no or low flow conditions is not feasible. Flow diversion measures may include pumps to ensure that water can be moved from one side of blockages to the other, with screened inlets to prevent the entrapment of aquatic fauna and outlet structures that are designed to avoid scouring of the channel. Where waterways are bunded or flow obstructed, all obstructions to flow will need to be removed as soon as practical after watercourse crossing construction has been completed. • Appropriate erosion and sediment controls that take into account potentially flood prone areas will	Table 3-1

CoA/ UMM	Condition description	Where addressed in the document
	be employed to manage water quality impacts and indirect impacts to retained vegetation. - Waterway bed and bank material excavated during construction will be stockpiled outside of the active channel and avoid riparian vegetation. Any material excavated from the bed of waterways will be stockpiled separately from other materials and returned to the waterway bed following the completion of construction work. - If the stockpiling of sediment or soil is required, it will be located as far away from waterways as practicable and managed so that it is secure against flooding and runoff to prevent any sediment entering waterways. Adequate erosion and sediment control measures will be in place to protect stockpiled sediment against runoff during rainfall or flooding. - Only excavated natural materials (ENM) or virgin excavated natural materials (VENM) will be used as fill during reclamation work, i.e. no contaminated material, building or demolition rubble will be used as fill in any stream crossings. - Chemicals will be stored in adequate bunding (in accordance with Australia Standard 1940 – The storage and handling of flammable and combustible liquids) as far away from streams as practicable and appropriately protected against flooding or runoff. Spill kits will be made available, and a spill response plan developed. Plant refuelling will occur as far away from streams as possible and appropriate spill prevention measures (such as diversion bunds/cut off drains upslope and drip trays and spill kits) will be implemented when refuelling.	

1.3 INDUCTION AND TRAINING

All Project personnel are to be inducted on the existence of this Procedure during the Project Induction and in more detail as required in Site Inductions, Toolbox Talks, daily prestart briefings, or targeted training as required. Records of all training, including inductions, will be maintained. Records will include the name and role of the attendee as well as the name of the course.

1.4 RELEVANT DOCUMENTS, GUIDELINES AND SPECIFICATIONS

This procedure has been developed with consideration to the HumeLink Vegetation Clearing Method and Management Memorandum (Nov 2023), the glider memo (Niche 2023) and a review of BMP Connect. This strategy has also been developed in line with Transgrid Connectivity Review Letter (July, 2025).

2 CONNECTIVITY CORRIDORS

Habitat loss and fragmentation are recognised as key issues affecting biological diversity. These altered patterns of habitat result in changes to ecological processes, having significant effects on flora and fauna. Fragmentation results in the loss of individual species and species diversity from an area, restrictions on population size and biomass, decreased opportunity for movement of animals between habitats, changes to the physical environment and increased invasion and negative impacts by exotic species.

Strategies to create and/or retain vegetation/ habitat linkages (i.e., connectivity 'corridors') may be implemented to ameliorate the effects of fragmentation and maintain and improve the conservation potential of disturbed environments. Given the linear nature of the Project, the use of connectivity corridors must be broadened to the issue of maintaining connectivity at the landscape scale, rather than on individual patches within the alignment. Landscape patterns that promote connectivity for species, communities and ecological processes are a key element in nature conservation in environments modified by human impacts.

Connectivity within the landscape is critical to gene flow and the long-term viability of species populations. Fauna species are often specifically adapted to, and reliant upon, the presence of preferred habitat and linkage between locations of varying carrying capacity. Loss of connectivity imposes a range of threatening processes reducing persistence, limiting population and species recruitment and potential for population decline.

2.1 IMPACTS ON THE PROJECT ON CONNECTIVITY CORRIDORS

Areas of vegetation identified for removal for the transmission line easement and the installation of the transmission line structures may potentially impact habitat connectivity for threatened fauna, flora, and threatened ecological communities (TECs). The barrier created from vegetation removal may result in reduced ability for terrestrial fauna, including threatened fauna, to move safely across the landscape to access nearby habitats. However, the extent of such impacts is likely to be limited given historic clearing and existing land use intensity within the Project footprint.

The ability of arboreal and gliding fauna to safely traverse across remaining patches of vegetation would become constrained with the increase in distance between patches, and it may represent a barrier for gliding species. During the field surveys conducted for the Revised BDAR, Southern Greater Glider (Bondo, Bungonia, Inland Slopes IBRA region) and Squirrel Glider (Crookwell, Inland Slopes, Murrumbateman IBRA subregion), were recorded in several locations throughout the Project footprint.

For small woodland bird species including Varied Sitella, Scarlet Robin, Pink Robin, Speckled Warbler and Brown Treecreeper, reduced landscape connectivity may create movement barriers (the sedentary nature of the species makes cleared land a potential barrier). Species such as Flame Robin and Scarlet Robin require connected corridors of vegetation for movement. Isolation of patches of habitat, particularly where these patches are smaller than 10ha, may result in isolated individuals.

For other fauna species with limited dispersal ability/mobility (highly restricted home ranges), such as Golden Sun Moth, Rosenberg's Goanna and Pink-tailed Legless Lizard; the reduction in habitat connectivity may, depending on the location, effectively isolate individuals or populations leading to a decline in the species population.

The increased distance between vegetation patches intersecting the project footprint is unlikely to impact the lifecycle of highly mobile species such as some microbats species, megabats and birds. However, the Project may result in fauna injury and/or mortality from transmission line collision, entanglement or electrocution.

For amphibian species like Sloane's Froglet, Booroolong Frog, Stuttering Frog and Yellow-spotted Tree Frog, the installation of maintenance access tracks across waterways (formal or informal) may reduce stream connectivity and breeding success of individuals. For threatened flora species such as the Crimson Spider Orchid, clearing, or reduced connectivity of habitat may reduce the pollination and dispersal success of the species. For TECs, increased fragmentation may result in loss of community composition, structure and function.

Connectivity corridor locations have been prioritised in areas mapped as containing habitat for threatened species, and/or habitat associated with species that are likely to occur.

Particular emphasis has been given to the Squirrel Glider (*Petaurus norfolcensis*) during the connectivity corridor selection process. UMM B10 prescribe the retention of Squirrel Glider habitat as an overarching priority for the project due to the species' high ecological value and threatened status. This includes the installation of “glider poles” in identified Squirrel Glider habitats (refer to Section 6).

2.1.1 FAUNA SPECIES

Assessment of prescribed impacts to habitat connectivity and fauna movement in the Revised BDAR (Niche, 2024) produced the following list of species likely to be affected by the Project:

- Threatened microbats:
 - Large-eared Pied Bat
 - Southern Myotis
 - Eastern False Pipistrelle
- Amphibians:
 - Sloane's Froglet
 - Booroolong Frog
 - Yellow-spotted Tree Frog
 - Stuttering Frog
- Gliders:
 - Southern Greater Glider
 - Yellow-bellied Glider
 - Yellow-bellied Glider population on the Bago Plateau (endangered population)
- Squirrel Glider
- Woodland Birds:
 - Flame Robin
 - Scarlet Robin
 - Varied Sitella
- Terrestrial and arboreal mammals:
 - Broad-toothed Rat
 - Eastern Pygmy-Possum
 - Long-nosed Potoroo
 - Smoky Mouse
 - Koala
- Reptiles:
 - Pink-tailed Legless Lizard
 - Striped Legless Lizard.

The Transgrid Connectivity Review (July 2025) identified known and assumed habitat for glider species across several key zones within the HumeLink East alignment. Notably:

- Southern Greater Glider habitat was identified adjacent to Minjarn National Park and within the Tarlo River National Park zone.
- Squirrel Glider habitat was identified near Mudjarn Nature Reserve, Bango to Dalton, and scattered between Woodhouselee to Taralga Road.
- Yellow-bellied Glider was identified via near Red Hill State Forest (based on a 2022 BioNet record) within the Inland Slopes IBRA subregion.

Assessment of prescribed impacts associated with fauna injury/ mortality from transmission line collision, entanglement or electrocution in the Revised BDAR (Niche, 2024) produced the following list of species likely to be affected by the Project:

- Forest Owls and Cockatoos
 - Barking Owl
 - Masked Owl
 - Powerful Owl
 - Sooty Owl
 - Gang-gang Cockatoo
 - Glossy Black Cockatoo
- Bats:
 - Grey-headed Flying-fox
- Raptors:
 - Square-tailed Kite
 - Little Eagle
 - White-bellied Sea-Eagle
- Microbats:
 - Large Bent-winged Bat
 - Large-eared Pied Bat
 - Little Bent-winged Bat
 - Southern Myotis
- Migratory birds:
 - White-throated Needletail
 - Fork-tailed Swift
 - Sharp-tailed Sandpiper
 - Red-necked Stint
 - Latham's Snipe
 - Common Greenshank
 - Marsh Sandpiper.

2.1.2 THREATENED ECOLOGICAL COMMUNITIES

Three threatened ecological communities (TECs) will be affected by reduced connectivity (Niche, 2024):

- Coolac-Tumut Serpentine Shrubby Woodland in the NSW South-Western Slopes and South-Eastern Highlands Bioregions
- Tableland Basalt Forest in the Sydney Basin and South-Eastern Highlands Bioregions (Tableland Basalt Forest)
- Monaro Tableland Cool Temperate Grassy Woodland in the South-Eastern Highlands Bioregion (Monaro Tableland Cool Temperate Grassy Woodland)

The proposed clearing work would result in further loss and fragmentation of TEC remnants within the amended project footprint. These TECs have been extensively cleared and the communities are already severely fragmented. Many of these remaining patches occur on road reserves, the edges of house paddocks, or beside steep slopes on the edges of cleared land. Proposed clearing would predominantly impact more degraded TEC patches and edge environments.

Connectivity corridor locations have been prioritised in areas mapped as containing these TECs.

2.2 SIGNIFICANT LANDSCAPE FEATURES

The Project intersects several significant landscape features. These features serve as natural corridors connecting different areas of habitat, migratory flight paths to important habitats, or local movement pathways. The Project will impact these natural corridors by fragmenting the landscape with a linear disturbance.

2.2.1 CONSERVATION RESERVE ESTATES AND BIODIVERSITY STEWARDSHIP SITES

The Project is situated near several conservation areas including:

- Minjary National Park
- Mudjarn Nature Reserve
- Burrinjuck Nature Reserve
- Bango Nature Reserve
- Back Arm Nature Reserve
- Tarlo River National Park

The Project footprint abuts the eastern boundary of Minjary National Park, approximately 10km north-west of Tumut in the Inland Slopes Interim Biogeographic Regionalisation for Australia (IBRA) subregion. The Park was gazetted on 1 January 2001 given its significance in providing a vegetated link between larger tracts of forest to the south (in Kosciuszko National Park), the Tumut River Valley and nearby Ellerslie Nature Reserve and Tumblong Reserve to the north-west of Tumut (NSW National Parks and Wildlife Service, 2004).

Mudjarn Nature Reserve protects areas of remnant native forest, including small pockets of Yellow Box and Red Gum woodland, a component of the endangered White Box - Yellow Box - Blakely's Red Gum woodland community. Nine species of mammal, four frogs, seven reptiles and 153 species of bird have been recorded in the reserve, including six threatened bird species. Mudjarn Nature Reserve also protects Aboriginal cultural heritage sites, landscapes and other features that have high significance to the local Aboriginal community.

[REDACTED]

[REDACTED]

[REDACTED]



2.2.2 KEY RIPARIAN CORRIDORS



3 PROJECT APPROACH TO CONNECTIVITY CORRIDORS

Whilst the Project will result in a level of fragmentation, functional connectivity between habitats is likely to be largely maintained, as the alignment will not be completely cleared. In particular, minimising clearing through only removing the vegetation that is within, or could grow into or fall into, the Transgrid's minimum Vegetation Clearance Requirements (VCR) will result in reduced (selective) clearing, particularly in woodland areas. This will result in reduced fragmentation of habitats and maintenance of connectivity. Indicative disturbance zones are presented in Figure 1 - Figure 4.

The method of clearing changes based on the specific disturbance area. The key disturbance areas are as follows:

- Total clearance zone (TCZ) where all vegetation/ habitat would be removed
- Easement clearance zone (ECZ) which would be subject to partial loss of vegetation associated with clearing taller vegetation within the easement. Mid-storey vegetation is to be retained, and ground cover is to be retained apart from limited circumstances such as access.
- Hazard tree zone (HTZ) which would be subject to partial loss of vegetation associated with removal of hazardous trees.

3.1 TOTAL CLEARANCE ZONE

TCZ lands are subject to total clearing and ground disturbance (including earthworks). Permanent structures including transmission line structures, access tracks and substations as well as temporary construction compounds, worker accommodation facilities and brake and winch sites.

Where possible, existing access tracks and clearings will be used to limit the construction of new tracks. Certain access tracks referred to as un-improved tracks, particularly those within non-wooded native pastures would not require clearing or ground disturbance however it is assumed this would occur for the purpose of impact quantification.

The TCZ will require the complete removal of vegetation to facilitate safe access to construction vehicles, plant and equipment and the erection of transmission line structures. Clearing would be undertaken with the use of machinery, or manually where it is unsafe to operate machinery or access is limited. Root balls will be removed at foundation locations and potentially in other earthworks areas. However, root balls would be retained where practicable within the transmission line structure zone to minimise potential environmental and heritage impacts.

For conductor stringing purposes, a drone or helicopter will be used to avoid vegetation disturbance.

3.2 EASEMENT CLEARANCE ZONE

ECZ includes land within the proposed transmission line easement where clearing and ongoing maintenance of tall growing vegetation would be undertaken. Tall growing vegetation includes any vegetation that may intrude on the VCR at Maximum Line Operating Conditions (maximum conductor sag and blowout) at that location now or at any time in the future. Vegetation clearance heights are set by Transgrid for operational and safety requirements, including bushfire risk management (Transgrid, 2020a). The assessment of tall growing vegetation would be by a qualified arborist with a minimum of two years' experience or possess Level 5 certification.

Earthworks and grubbing are not required within this zone except in limited circumstances such as access. Where practicable, clearing will retain mid and ground-story vegetation in this zone up to 5.6 m based on the minimum ground clearance minus the vegetation clearance requirement (Transgrid, Nov 2023). Once the ECZ polygons are defined all identified tall growing trees need to be removed. In areas safely accessible to a machine, smaller trees (or other tall growing vegetation) <200mm diameter at breast height (DBH) would be removed using an excavator-mulcher. As such, ground cover species and low growth shrubs would be affected (particularly by trampling) during the mechanical clearing process as part of the movement of the machinery throughout the ECZ, as well as the felling and removal of felled tree branches/barrels.

For those parts of the easement that require access for clearing, impacts to native vegetation will be minimised by (but not limited to):

- Use of machinery that maximises vegetation clearance coverage/reach

- Use of machinery and tracks that minimise ground impacts
- Hand felling, where not safely accessible
- Consolidating/minimising machinery access paths
- Restriction of machinery access within ecologically sensitive areas (e.g. wetlands and bogs)
- Use of non-lethal methods of temporary vegetation removal (eg mulching/slashing, cutting), that would allow native vegetation to re-grow
- Use of targeted methods of lethal vegetation control to avoid damage/death of non-target individuals (e.g. cut-stump painting of cleared woody individuals, rather than foliar spray applications).

Removal of scrub and undergrowth is only to be carried out to the extent necessary to meet the safety requirements for separation between infrastructure and vegetation.

Hand clearing/felling will also be used in the within 20m buffer of the project impact area as per listed threatened flora within Table 4 of the Vegetation Clearing Procedure, Appendix B of the BMP.. Where practicable, felled trees will remain in situ with the crowns/heads being cut/docked and laid flat. Fencing will be used to demarcate these areas.

For conductor stringing purposes, a drone or helicopter will be used to avoid vegetation disturbance.

3.3 HAZARD TREE ZONE

Includes land located within and adjacent to the transmission line easement where selective tree removal, trimming or lopping would be undertaken to manage any risk of infringement on the VCR at Maximum Line Operating Conditions (maximum conductor sag and blowout). Earthwork is not required within this zone.

Minimising ground disturbance will be of particular focus and where practicable, clearing will conserve mid and ground-story vegetation in this zone. Any adjacent and important habitat trees and features identified for retention will be clearly marked and included in maps within the CEMP to avoid disturbance during the felling activities. Opportunities for individually assessing and selectively clearing hazard trees will be considered further during detailed design to minimise impacts. Removed/felled vegetation will be left in situ with tree crowns cut/docked and laid flat. Areas of high ecological sensitivity identified in the constraints mapping would be fenced off and hand clearing/felling employed if required to avoid impacts to these areas.

3.4 CONNECTIVITY CORRIDORS

There are no optimal parameters, or minimum width and length for connectivity corridors aimed to facilitate the movement of multiple species. This is due to the fact that corridor use is dependent on a number of factors including the location of the corridors within the context of the surrounding landscape; habitat type, quality and suitability; and the target species (Lindenmayer, 1994). However, wider connectivity corridors generally better support fauna movement (Baur & Baur, 1992; Lindenmayer, 1994).

The width of the connectivity corridors will be maximised wherever possible. The minimum width that can be feasibly employed along the Project alignment is 20m. This has been determined by the existing habitat present, and the detailed design of the Project. The priority for connectivity corridor siting will be in valleys or near towers where the height of the transmission line is greater, and an increased vegetation height can be accommodated. The locations of corridors must consider the requirement to meet Transgrid's VCR at Maximum Line Operating Conditions.

These connectivity corridors will primarily involve the retention of native vegetation but will also include the installation of ground refugia (creation and re-use of timber/ logs and rock gardens) and artificial connectivity structures (glider poles) at certain locations.

Where new or existing access tracks intersect with the connectivity corridor, these access tracks will be used during the construction period (to limit the need for additional clearing which would otherwise be required outside of, or around, the connectivity corridor). Clearing of the connectivity corridor will therefore be required to install a new access track within the easement or maintain existing tracks.

Where a connectivity corridor is proposed and this intersects with an access track outside the easement, the existing tracks remain narrow enough not to present a significant barrier to connectivity

corridors. Furthermore, the short-term duration of use of the temporary access tracks for construction, and the rare intermittent use during operation will not impact the proposed effectiveness of the connectivity corridors.

3.4.1 MINIMISE VEGETATION CLEARANCE

Construction will avoid and minimise any disturbance of connectivity corridors, where practicable. Minimising clearing through only removing the vegetation that is within, or could grow into or fall into, the Transgrid's VCR will result in reduced (selective) clearing, particularly in woodland areas. This will result in reduced fragmentation of habitats and increased connectivity. The retention of the ground and shrub layers would also facilitate movement for these small woodland species. Opportunities for intact and/ or higher condition remnants will be prioritised for avoidance incorporating consideration of connectivity between retained remnants within and adjacent to the Project footprint.

3.4.2 VEGETATION STEPPING-STONES

To better facilitate fauna movement, retaining patches of vegetation can serve as stepping-stones, allowing for species movement between larger patches. The use of stepping-stones is most effective between areas of good condition vegetation (i.e. native canopy) and where the distance between stepping-stones is minimised. Where final clearing limits allow, vegetation stepping-stones will be used as a connectivity action to mitigate impacts to connectivity within the chosen corridor, subject to ground verification. Patches of retained vegetation should include representatives in each stratum and occur no more than 30m from the next patch of vegetation, where possible.

3.4.3 GROUND REFUGIA

The movement of ground-dwelling fauna can be supported in fragmented landscapes through the placement of salvaged logs and rocks.

The salvage and re-use of habitat features within the Project area are discussed in the Supplementary Hollow and Nest Strategy (Appendix E of the BMP) and Vegetation Clearing Procedure (Appendix B of the BMP). Salvaged habitat is to be placed in a sensitive manner so as to not impact retained vegetation, and should provide continuous habitat across the width of the alignment or between patches of existing habitat. Logs should be no smaller than 10cm wide and 3m long, with a focus on larger diameter logs of lengths >5m, where possible. Smaller logs can be placed in bundles and larger logs singularly. Ground refugia should be placed to ensure a corridor of habitat that is ≥20m wide. The amount and precise location/ extent of ground refugia to be placed within a corridor will be determined following the field-based validation surveys.

Rocky outcrops should also be incorporated into ground corridors where possible, particularly in areas identified as potential habitat for Pink-tailed Legless Lizard or Stripped Legless Lizard.

Where access tracks are required to cross ground corridors, consideration must be given to vehicle strike and mitigation measures to minimise the likelihood relevant to the target species.

3.4.4 DEDICATED ARBOREAL CROSSINGS

Glider poles are suitable artificial structures for facilitating movement of arboreal mammals that glide between habitat patches. This includes several threatened species, such as the Squirrel Glider, Yellow-bellied Glider, and Southern Greater Glider, as well as non-threatened species including Krefft's Glider and the Feather-tailed Glider. These structures are designed to help gliders traverse clearings where forest canopy gaps exceed their natural glide capacity.

To be effective, glide poles and associated landing points must be positioned close enough and high enough to ensure that glide trajectories remain airborne and do not intersect the ground. The functionality of glider poles can be significantly improved by retaining mature trees in adjacent areas, which provide natural launch and landing points and support safe and regular use by gliders.

The Connectivity Review (Transgrid, July 2025) reviewed which connectivity corridors from the BDAR are associated with habitat for the threatened Glider species. Each corridor was then visually assessed using aerial photography, vegetation cover, and the disturbance footprint to evaluate existing connectivity and the project's impact on that connectivity. However, changes in the final design may alter these impacts, and as such the conclusions of the review must be reviewed based on the final

layout plans. The final placement of glider poles will then be determined on-site in consultation with specialist ecologists, ensuring alignment with retained vegetation and local habitat features to maximise usage by target species. Further detail is provided in Section 6.

(see Section 6).

3.4.5 AQUATIC CONNECTIVITY

The connectivity goal for aquatic fauna is to maintain access to important habitats and prevent and minimise the potential for mortality during construction works (see Table 3-1). Connectivity for aquatic fauna is provided by existing watercourses.

For in-stream works, directions on the use of sediment and erosion controls must be followed to avoid impacts on water quality and fish passage. For example, where it is not possible to work in the dry (out of the water), a sediment or silt screen may be required around the entire work area, but should not extend across the waterway, as it may obstruct fish passage. Silt screens should be placed to isolate the works area and be attached to the same bank upstream and downstream of the work site. Sediment or silt screens should be inspected daily and maintained to prevent the escape of suspended sediments. Sediment control devices should not be removed until the risk of sedimentation and erosion is negligible, and the site has been stabilised or revegetated following construction. Screens or other guards should be carefully removed after the work is completed. Silt screens should generally only be used in still water conditions as when placed in higher flows, water either spills over the top or lifts the curtains.

The design of fauna friendly drainage structures must maximise light penetration under the bridge or arch to encourage fish passage, possibly by increasing the spacing between divided bridge decks or with the use of skylights or grates in the median strip. Both permanent and temporary waterway crossings must accommodate the needs of fauna and must comply with the requirements of the UMMs (see Table 4 of the BMP).

Pre-construction surveys required to be completed at CLASS 1 streams identified as supporting potential habitats for threatened species at the site of proposed new tracks or upgraded tracks per UMM B33 is detailed in Section 7.3 of the BMP.

Per UMM B34, in the event that any further or alternative waterway crossings are required in areas mapped as Key Fish Habitat (KFH) or indicative threatened species distribution mapping an aquatic ecological assessment will be undertaken at the proposed crossing location as detailed in Section 7.2 of the BMP.

Table 3-1. Waterway and drainage requirements for fauna.

Waterway and drainage structure issue	Requirement	Source
1. Design, location and installation of fauna friendly structures	1.1 Design of structures must comply with advice from DPI (Fisheries) 1.2 Minimise the impact of essential instream structures by mimicking natural flows (DPI, 2005b). 1.3 Following Fairfull (2013), for waterway crossings incorporating culverts, a minimum of 300 mm of water should pool through the structure, with a centrally placed low-flow cell being preferable. 1.4 In line with Cotterell (1998), it is recommended that flow over or through instream crossing structures are designed such that they maintain a water velocity of 0.3 m/s or less, which is likely to facilitate passage for native species of fish (velocities exceeding 1 m/s, are likely to prevent upstream migration of native fish). 1.5 Transmission line structures will be located and constructed to minimise impacts on vegetated riparian zones (VRZs) 1.6 The final transmission line easement will target narrow crossing points of waterways and riparian areas clear of vegetation. Shrub or ground stratum native vegetation within vegetated riparian zones will be protected to the greatest extent practicable, with vegetation clearing ideally limited to the tree stratum only, with trunk bases being retained in situ. Where threatened species	UMM B27 UMM B30 UMM B31 UMM B33 UMM B34 UMM B35 Good practice

Waterway and drainage structure issue	Requirement	Source
	are known to occur, work methods will avoid or minimise impacts by limiting clearing wherever possible and delineating their habitat outside the final disturbance area as no-go zones. Work near waterways will be undertaken to avoid impacts such as herbicide drift/overspray, erosion and damage to the banks. Riparian areas subject to disturbance will be progressively stabilised and rehabilitated. Disturbance of bush rock in riparian areas will be avoided wherever practicable. 1.7 Any existing crossings will be re-used or upgraded in preference to establishing new crossings 1.8 Disturbance to waterways (bed, banks and associated riparian zones), will be avoided or minimised 1.9 The crossing design and construction work sites will minimise disturbance to any native vegetation, including native instream, fringing, and riparian vegetation within the access track alignment 1.10 Waterway crossings will be constructed perpendicular to the flow of the water and be positioned away from channel bends (where erosive forces are typically greatest). Preferably crossings will be located in straight stream sections with well-defined channel geometries and shallow stream gradients, in stable dry reaches 1.11 Micro-siting will avoid direct and indirect (erosion or sedimentation) impacts on riverine features such as riffles and rapids and sensitive habitat features (i.e. snags, coarse woody debris, instream macrophytes, boulders) 1.12 Where instream structures are required, considerations of potential flooding and erosive effects will be made in the design and construction of the crossing 1.13 Flow diversion measures will be installed on bunded waterway crossings as appropriate or where construction during no or low flow conditions is not feasible. Flow diversion measures may include pumps to ensure that water can be moved from one side of blockages to the other, with screened inlets to prevent the entrapment of aquatic fauna and outlet structures that are designed to avoid scouring the channel. Where waterways are bunded or flow obstructed, all obstructions to flow will need to be removed as soon as practical after watercourse crossing construction has been completed. 1.14 Appropriate erosion and sediment controls that take into account potentially flood prone areas will be employed to manage water quality impacts and indirect impacts to retained vegetation. 1.15 The need for and location of waterway crossings at identified CLASS 1 locations would be confirmed during detailed design by the construction contractors. Crossing design would preference a single span bridge structure at where practicable (aligning with the recommended crossing types identified by NSW DPI Fisheries for CLASS 1 streams) to avoid instream impacts, particularly within threatened species potential distributions. Consultation will be undertaken with NSW DPI Fisheries as to crossing designs and the potential occurrence of threatened aquatic species to inform detailed design and survey. 1.16 If a waterway crossing at Oolong Creek is required, the waterway crossing will incorporate a fish passage barrier to prevent the upstream incursion of European Carp and Redfin Perch to protect the Endangered Southern Pygmy Perch Population. If the design cannot incorporate an appropriate fish passage barrier, further engagement will be undertaken with DPI Fisheries to confirm alternate measures for implementation.	
2. Scour protection	2.1 Scour protection must be integrated with waterway banks/ vegetated zones to minimise waterway impacts and provide a more natural solution. 2.2 Rock size must not be so large as to impact water flow regimes and fauna passage. 2.3 Low-flow channels must be provided in scour protection to tie in with any fish passage low-flow provisions in culvert/ pipe cells and where required under bridges.	UMM B32 Good practice

Waterway and drainage structure issue	Requirement	Source
	2.4 Stabilising materials such as rock armouring, hydro-mulch, jute matting, or other suitable geotextile materials may be utilised where necessary	
3. Landscaping within approaches to waterway and drainage structures	3.1 Clearing of existing vegetation near culverts and bridges must be minimised, and root mass and seed banks must be retained where possible. 3.2 Revegetation near culverts and bridges must be commenced as soon as practicable after clearing of existing vegetation and within 3 months of completion of construction of each culvert and bridge. 3.3 The density of vegetation planting or seeding must not be less than the surrounding natural habitat. 3.4 Vegetation planted or seeded within the approaches to culverts and bridges must be endemic and representative of the surrounding natural habitat. 3.5 Any sections of stream or waterway banks that are impacted or modified by the project will be reformed or remediated to resemble the pre-work condition and form wherever possible or alternatively, to a stable design form, as appropriate following the completion of construction work. This may include revegetation to stabilise bank sediments. Waterway banks impacted by the project will be reinstated such that bank stability at the crossing location is the same or better than prior to construction 3.6 Any temporary stream crossings will be removed and rehabilitated at the completion of their operational use	UMM B32 Good practice

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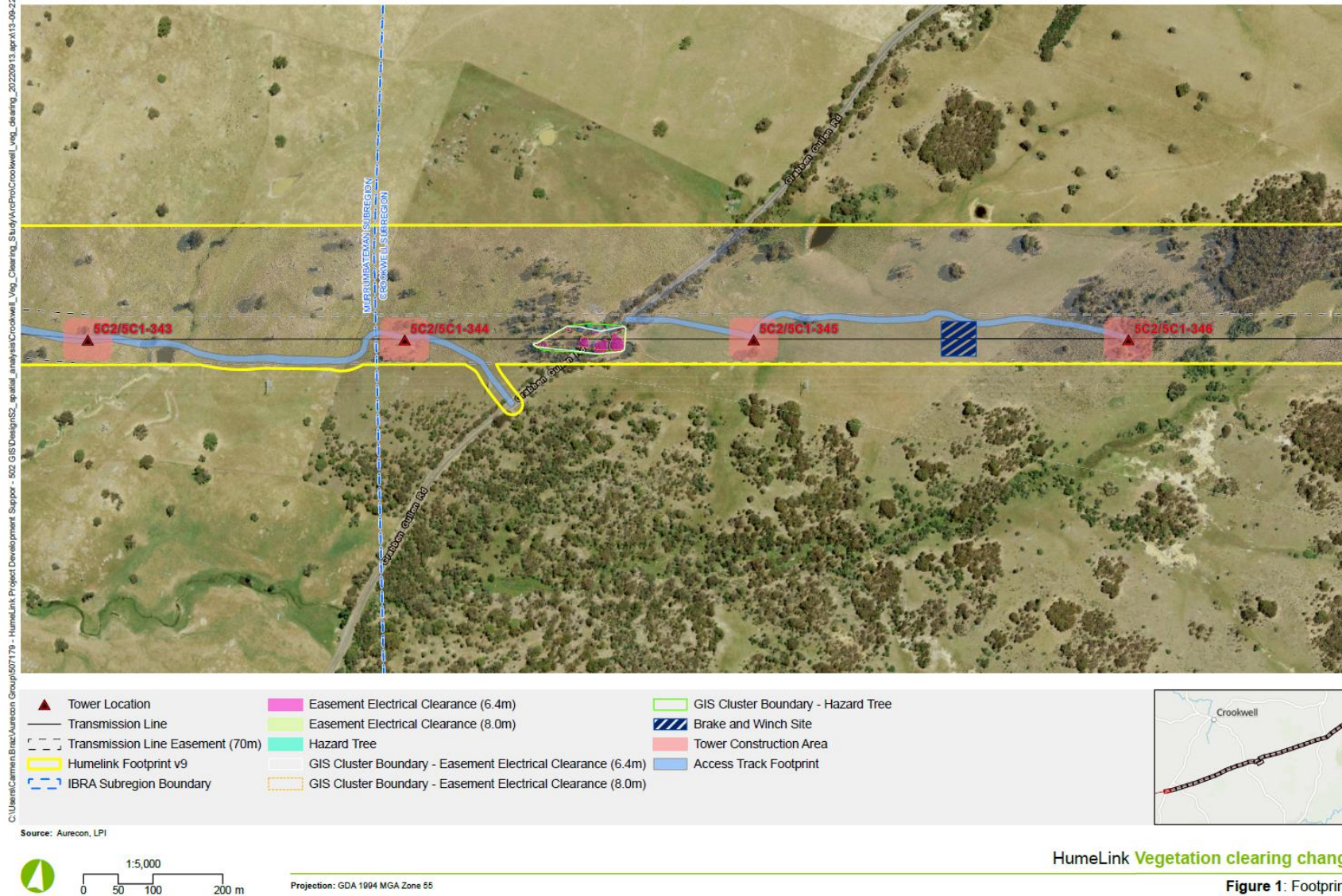


Figure 1. Indicative disturbance footprint.

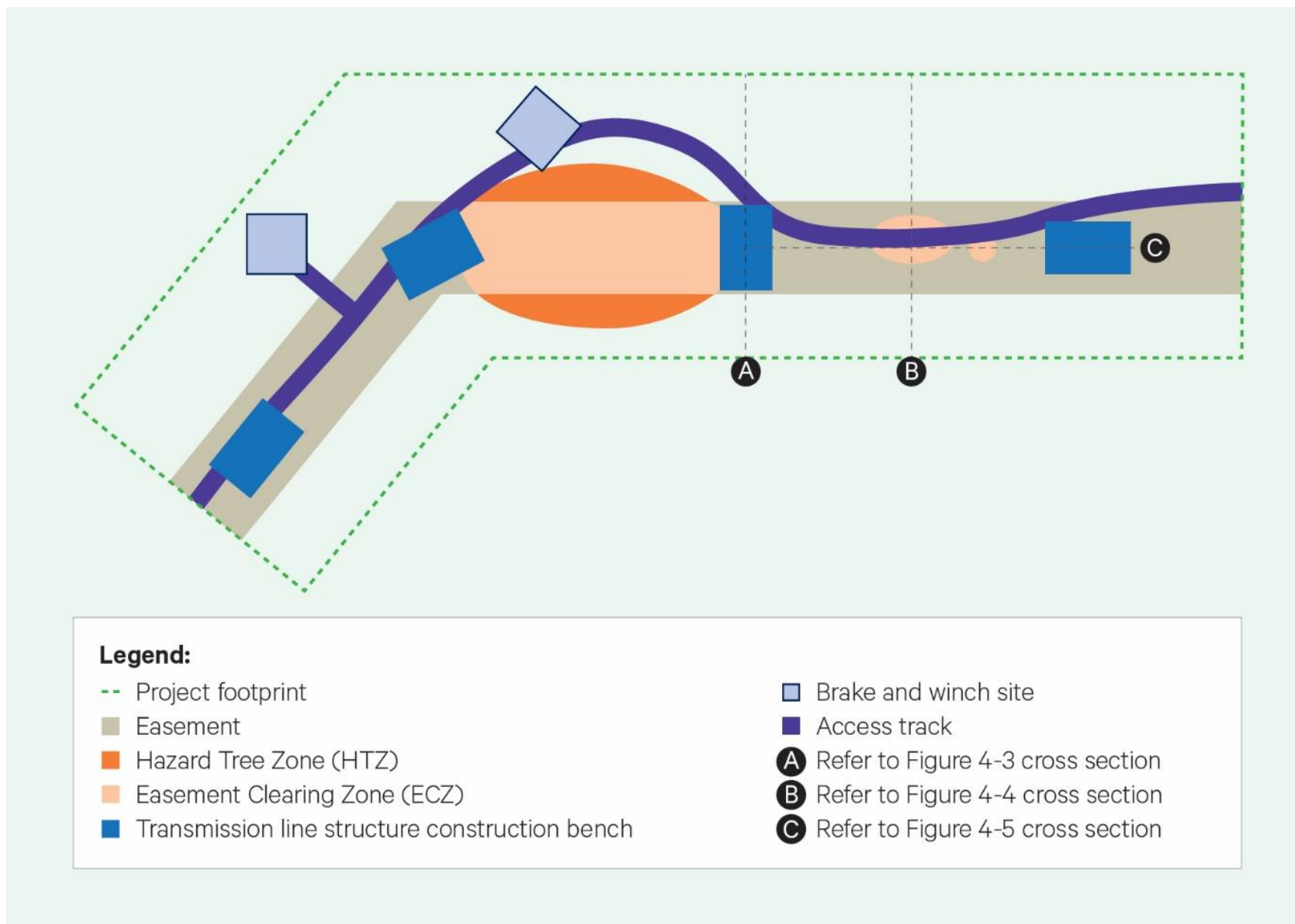


Figure 2 Indicative vegetation clearing zones within the project footprint

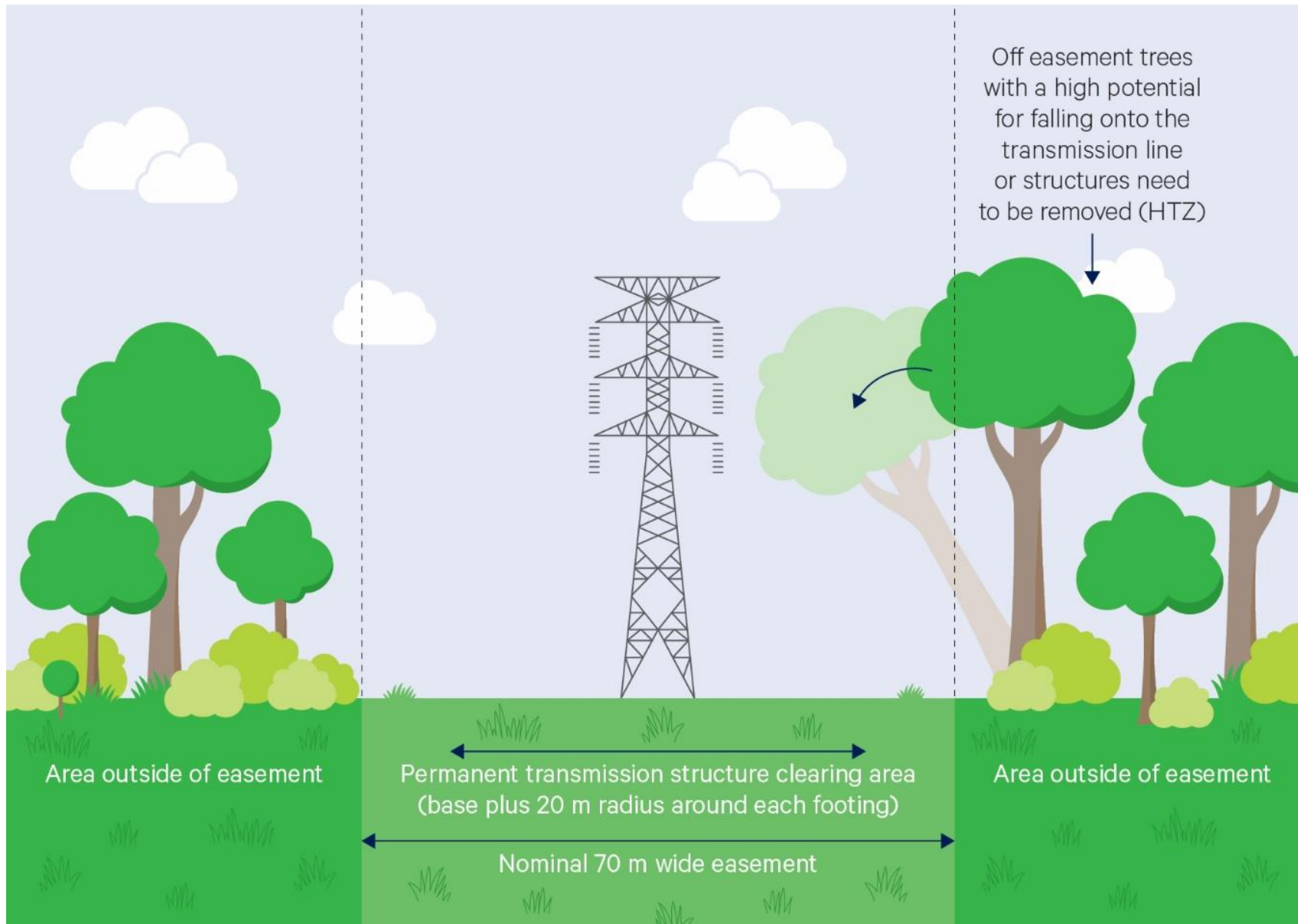


Figure 3 Indicative vegetation clearing around a typical transmission line structure

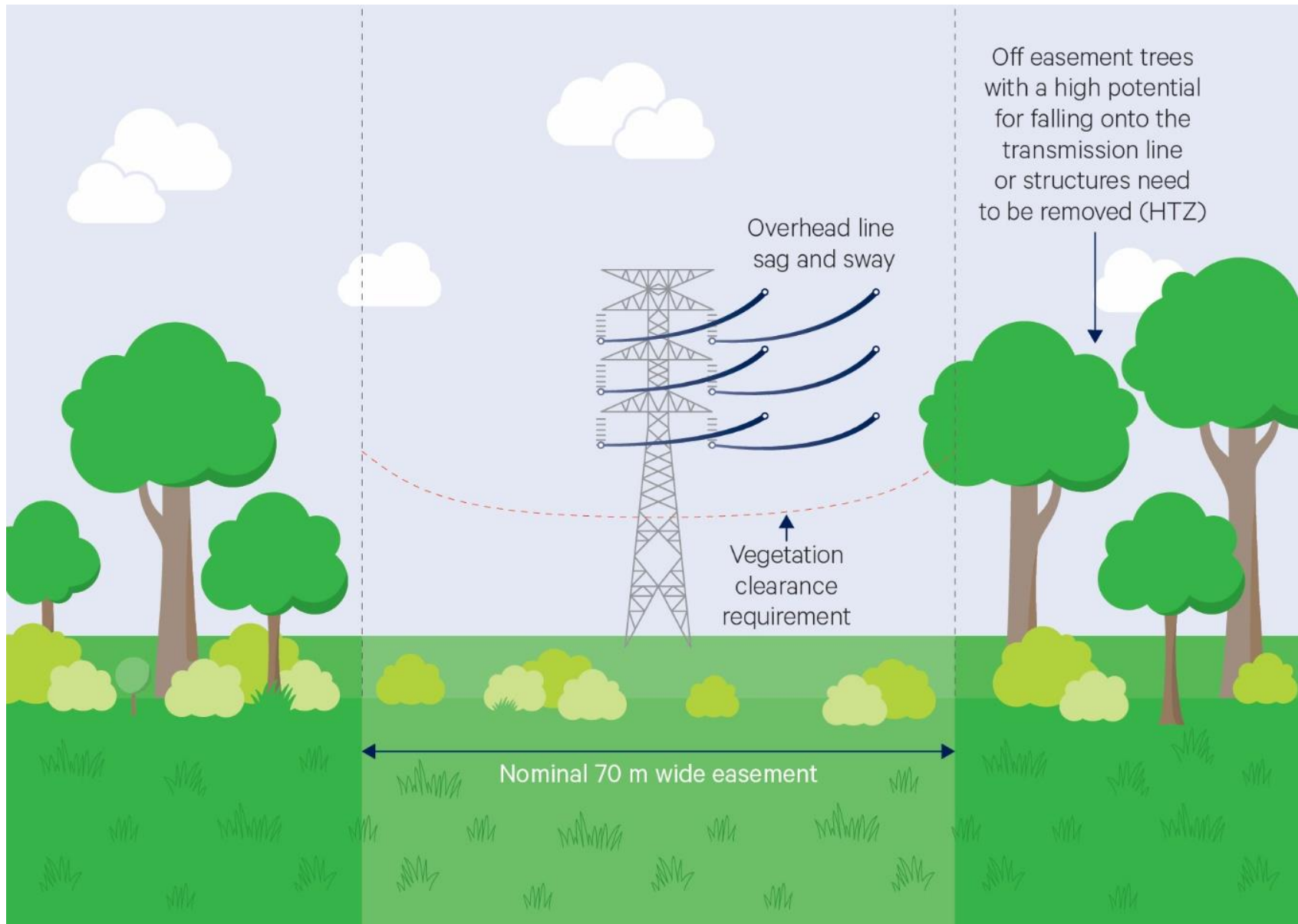


Figure 4 Indicative vegetation clearing within the easement

4 METHOD FOR CONNECTIVITY CORRIDOR SELECTION

4.1 EXISTING CONNECTIVITY

Candidate connectivity corridors have been identified in the Revised BDAR (Niche, 2024) and reviewed by the BMP Connectivity Review (Transgrid, July 2025), refer to Figure 5 to Figure 12 below. The criteria applied to assess existing levels of connectivity and any risk of impact as a result of the Project are outlined in Table 4-1. The recommended mitigation measures to reduce impacts to connectivity as a result of the Project (Transgrid, July 2025) will be prioritised within connectivity corridors supporting moderate to high levels of existing connectivity and that were identified as having a moderate to high risk of impact. Efforts will be made to maintain connectivity in connectivity corridors identified as having a low risk of impact.

Table 4-1. Existing connectivity, and risk of impact criteria

Existing connectivity	Criteria for existing connectivity	Risk of impact on connectivity	Criteria for risk of impact on connectivity
High	Considered to have high connectivity if any of the below criteria have been met: - High connectivity, and intact with the broader landscape (>100 ha patch size) - Species identified in the locality require larger areas to occupy as part of their home range (e.g., Owls, Gliders) have been identified within the vicinity corridor - The vegetation communities within the corridor are in moderate to very high condition - Field-based data has identified areas of high quality, connected habitats.	Major	Considered high risk of impact to connectivity if the below criteria are met: - If the proposed full vegetation clearance will effectively segment the remnant into two, or isolate an area of habitat - If a combination of clearances such as full, partial and hazard tree removal is likely to isolate individuals or impede terrestrial fauna movement - If species have been recorded in the locality that require large areas as part of their home range (e.g., Owls, Gliders), and a reduced home range is imminent as a result of the project - If species have been recorded in the locality that has restricted home ranges (<1 km), and the proposed vegetation clearance, is likely to effectively reduce or isolate habitat in the locality.
Moderate	Considered to have moderate connectivity if the below criteria have been met: - Moderately connected with the broader landscape (>50 ha patch size) - Field-based data has identified areas of good-quality habitats - Has connectivity in only one stratum layer - The vegetation communities within the corridor are in moderate condition - There is some evidence of fragmentation or edge effects, however largely intact.	Moderate	Considered high risk of impact to connectivity if the below criteria are met: - If the proposed full vegetation clearance will partially segment the remnant, or partially isolate an area of habitat (localised impacts) - If connectivity is to be maintained in at least one stratum layer - If vegetation clearance, is likely to partially impede, or affect fauna movement.
Low	Considered to have low connectivity if the below criteria have been met: Limited connectivity with the broader landscape, signs of fragmentation and devoid of native vegetation	Minor	Considered low risk of impact to connectivity if the below criteria are met: If the proposed construction footprint largely avoids any areas of connected, good-quality habitat

Existing connectivity	Criteria for existing connectivity	Risk of impact on connectivity	Criteria for risk of impact on connectivity
	- Field-based data has identified areas of low-quality habitats and observations of degradation - The vegetation communities within the corridor are non-native, or in low to degraded condition - Low fauna activity, or limited records in the locality.		- If the habitat is already effectively isolated, of low quality or degraded. - If vegetation clearance, is likely to partially impede, or affect fauna movement.

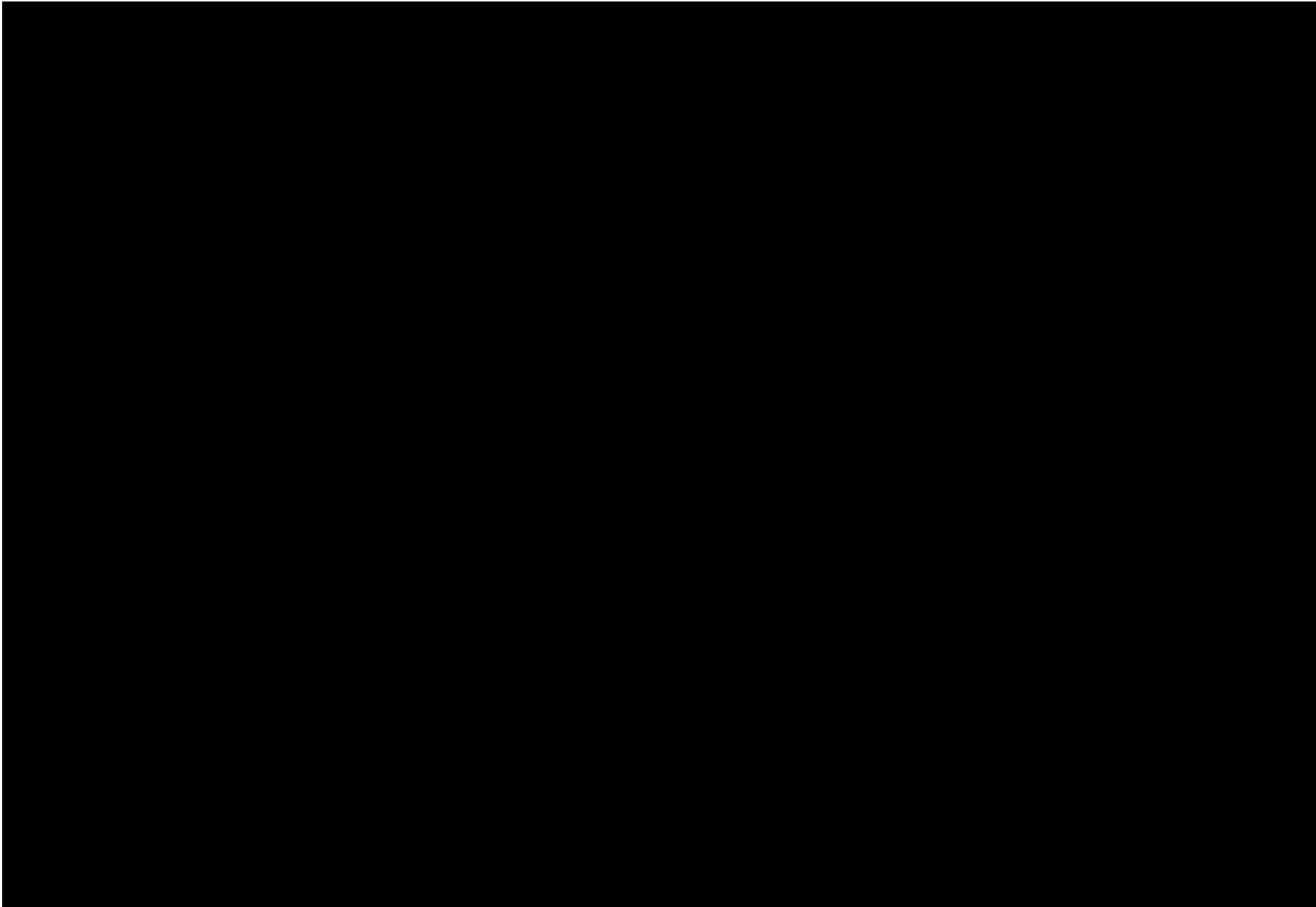


Figure 5 Connectivity Corridors Overview

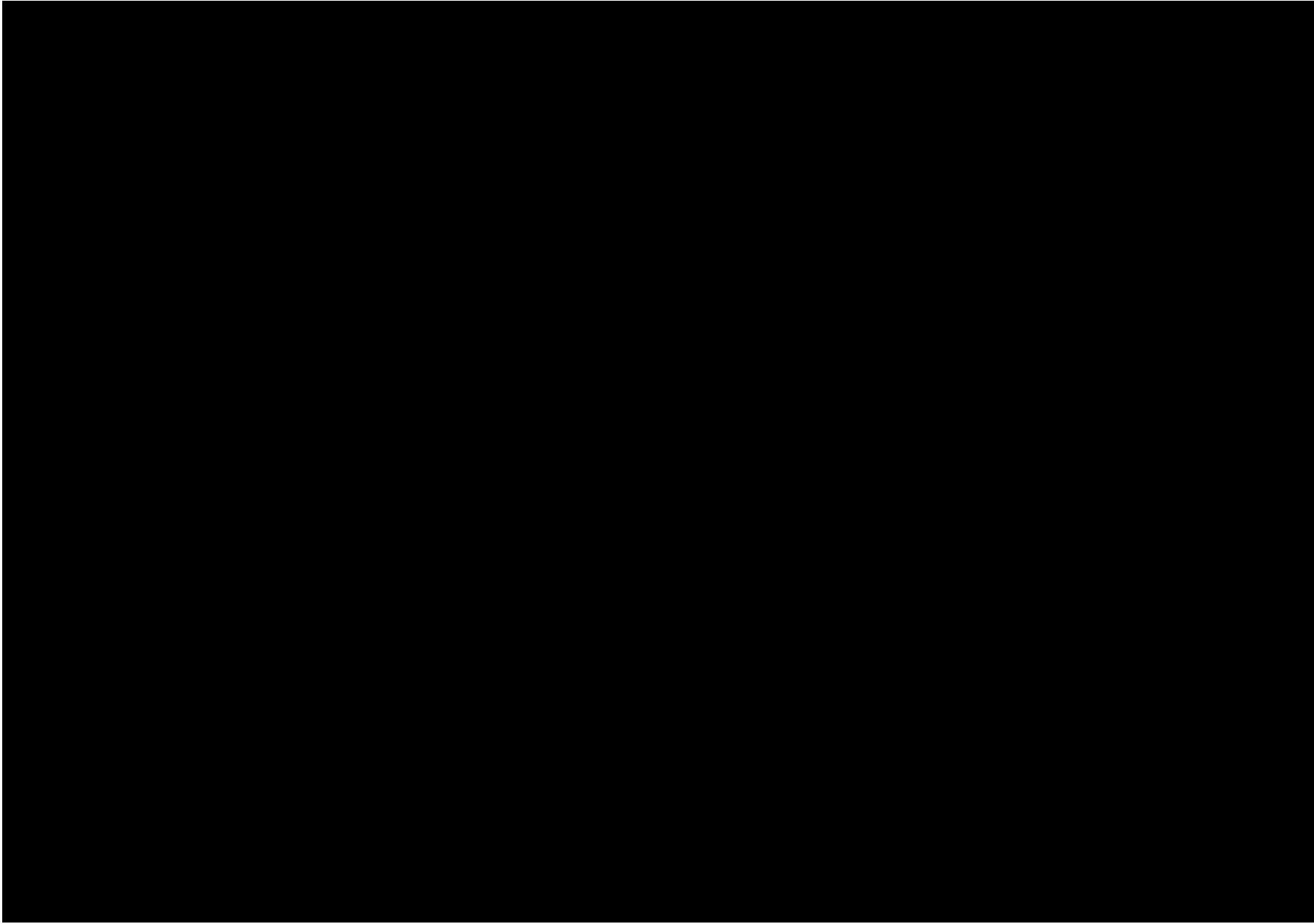


Figure 6 Connectivity Corridors Map 1

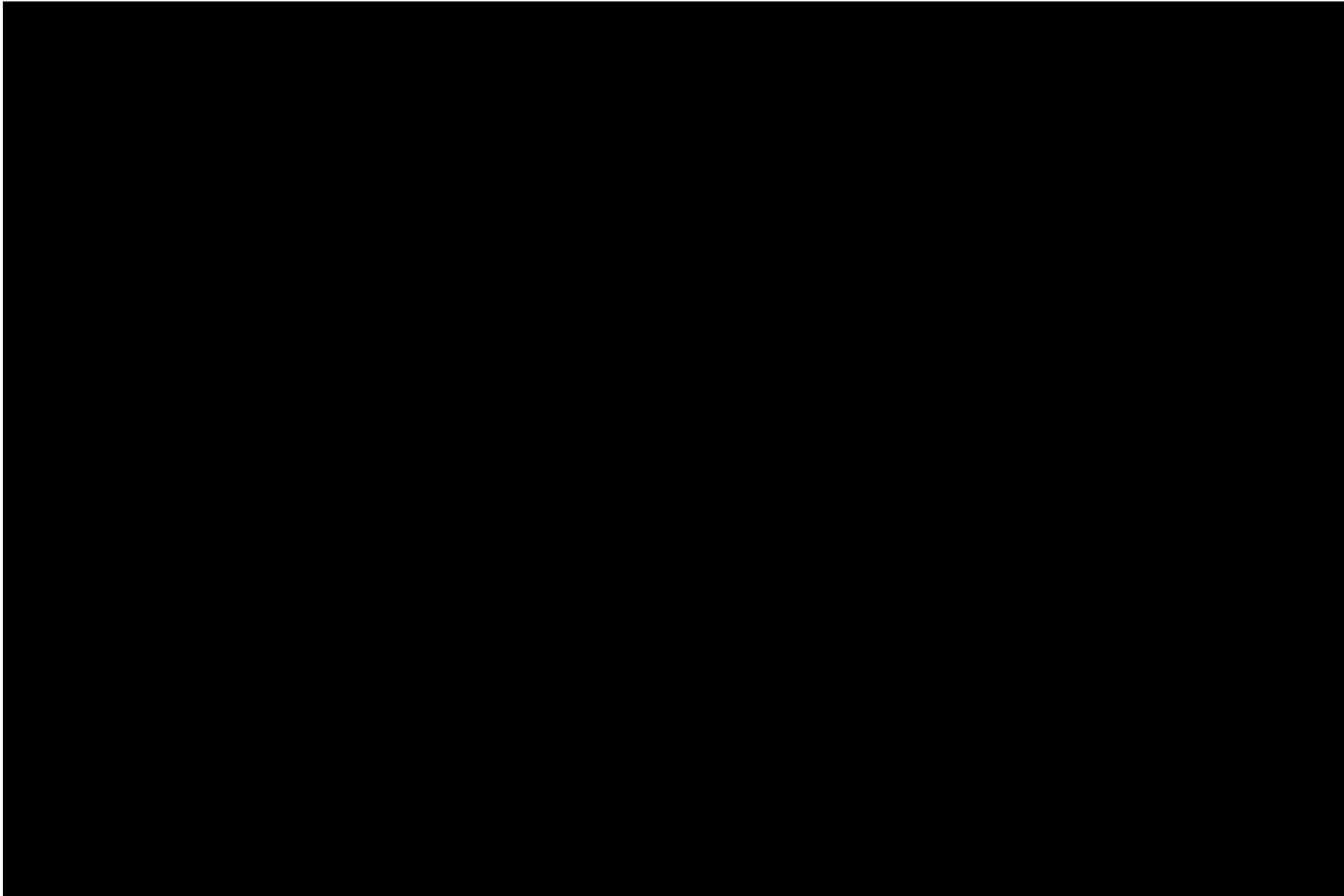


Figure 7 Connectivity Corridors Map 2

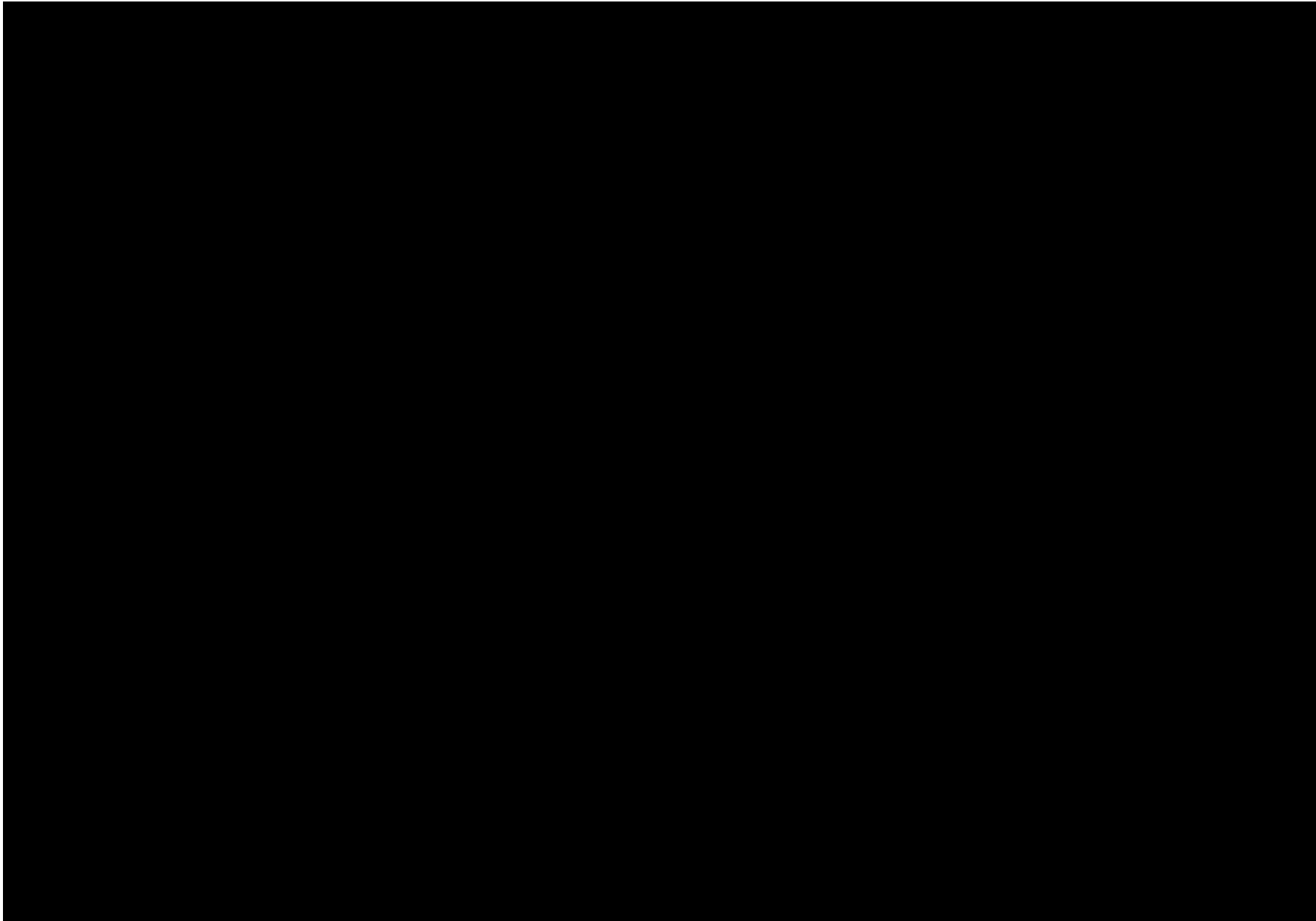


Figure 8 Connectivity Corridors Map 3

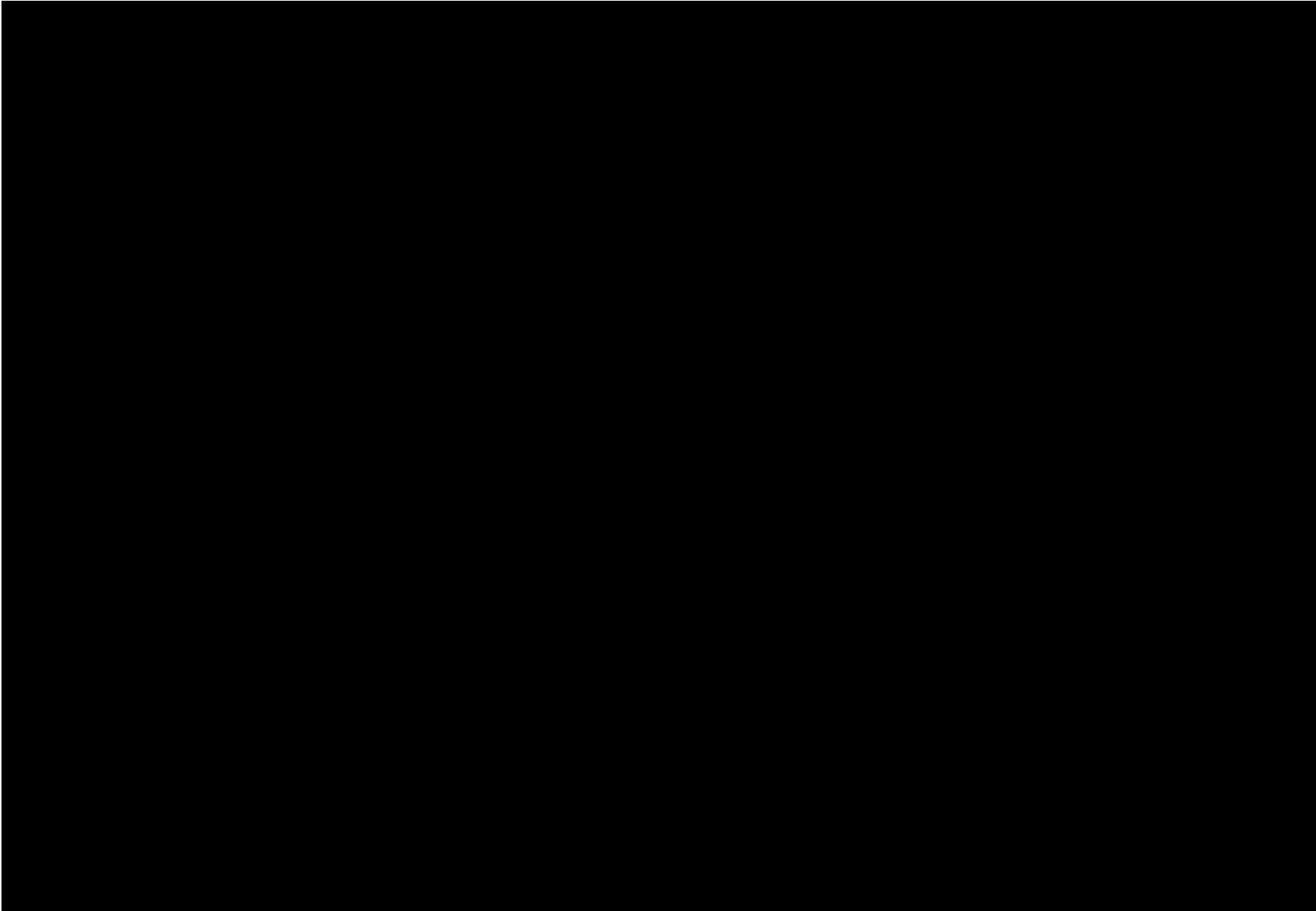


Figure 9 Connectivity Corridors Map 4

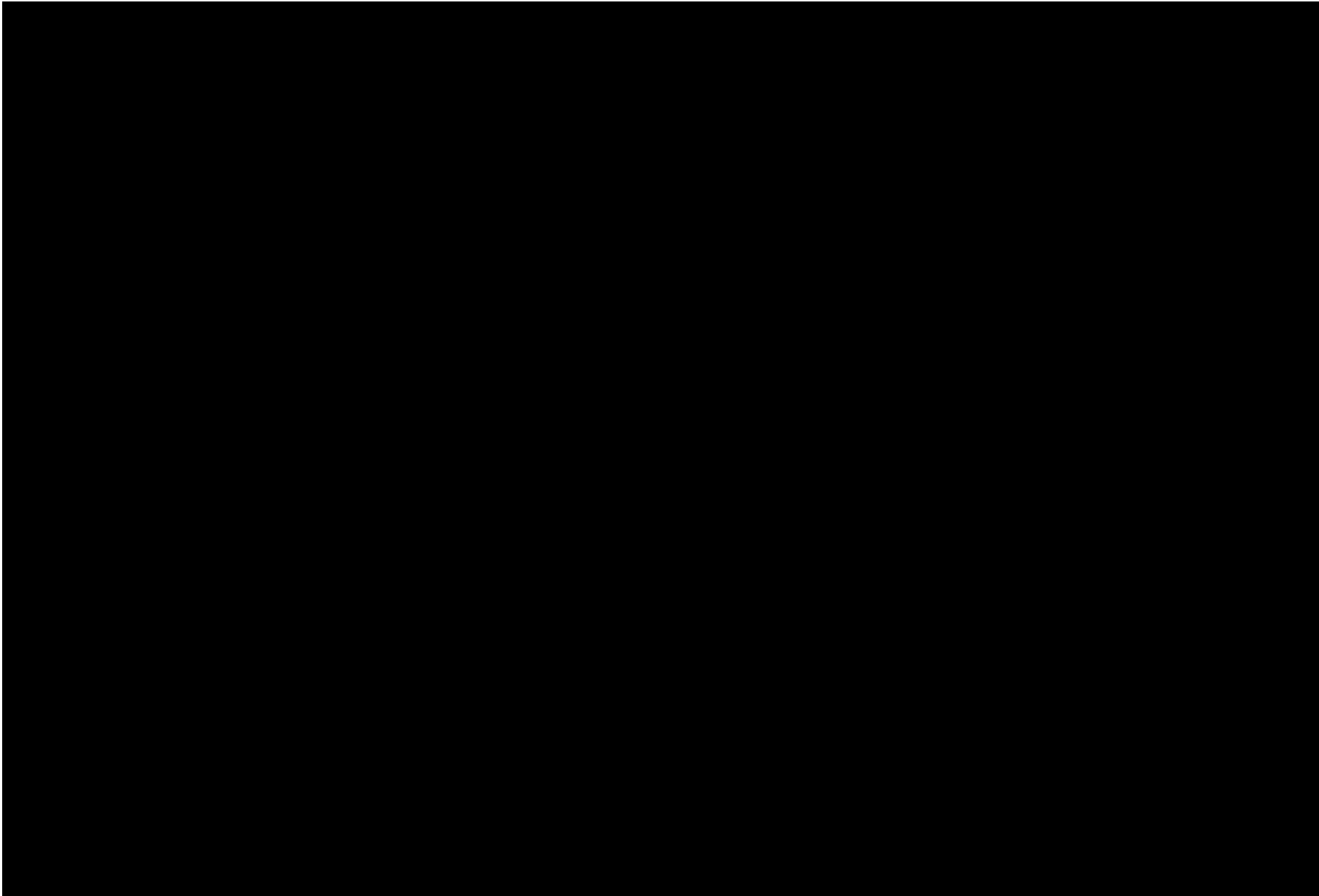


Figure 10 Connectivity Corridors Map 5

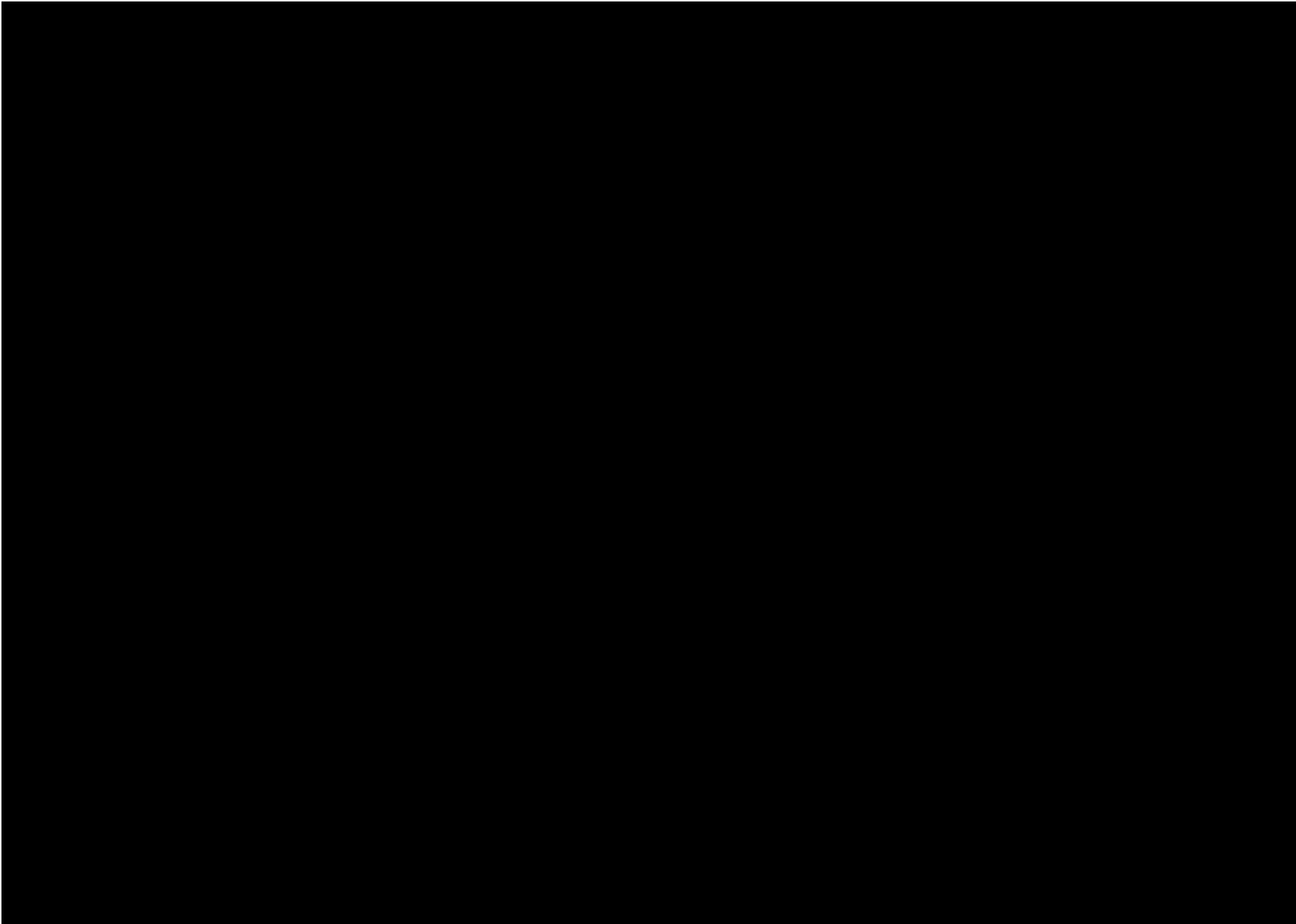


Figure 11 Connectivity Corridors Map 6

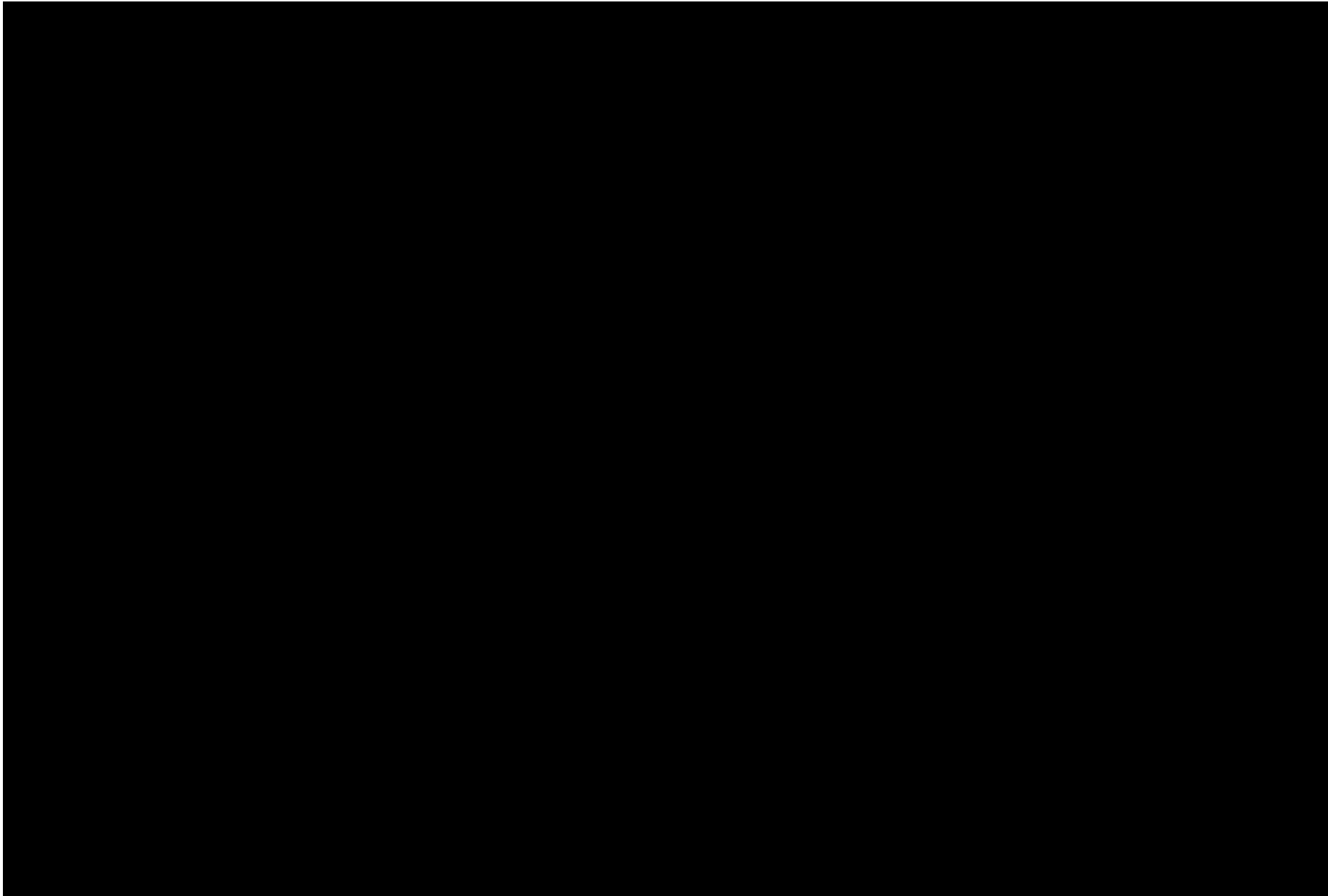


Figure 12 Connectivity Corridors Map 7

4.2 SELECTION PRINCIPLES

The key selection principles to consider when assessing the suitability of a connectivity corridor are:

- Major riparian crossings
- Joining proposed biodiversity stewardship sites and or conservation reserve estate
- Connectivity corridors are to be located where they provide benefit to the local landscape and should include structural vegetated connectivity linking the connectivity corridor with core habitat areas on either side of the project alignment (i.e. areas with moderate to high landscape connectivity, and with moderate to high levels of fauna activity/ movement)

Measures considered as a part of the Connectivity Strategy that would be further developed during detailed design include:

- Where proposed lines will parallel existing lines, a small deviation of the route to facilitate retention of a vegetated stepping-stone is recommended between existing and proposed lines.
- Restoration of brake and winch sites and access tracks post-construction where they intersect glider corridors
- Installation of glider poles in proposed restoration areas to facilitate connectivity during vegetation establishment
- Where tree retention is not feasible within the proposed easements, permanent installation of glider poles, to maintain connectivity
- Permanent installation of glider poles within existing easements that intersect glider connectivity corridors, to restore connectivity where feasible
- Further assessment of potential collision risks and appropriate design mitigations, where required
- Ongoing retention of large trees within Hazard Tree Zones that intersect glider corridors, subject to regular arboricultural assessment and tree maintenance/ pruning to minimise any safety risks.

4.3 SPECIES POLYGONS

In addition to the corridors proposed by Niche in the Revised BDAR, portions of the alignment that contain species polygons for threatened species have been considered when selecting connectivity corridors. Species polygons were developed for all candidate threatened fauna species where recorded or assumed present within the Project area (see Attachment 1 of the Revised BDAR for details on the approach to species polygon development). Species with restricted home ranges (i.e., < 1 km) are shown in bold in Table 5-1. Habitat constraints for each threatened species was also considered in the context of maintaining or enhancing connectivity.

4.4 PCT REPRESENTATION

Woodland-based PCT types, in good condition, have been considered a priority focus for locating connectivity locations, in accordance with UMM B27. Wet and dry sclerophyll forests and grassy woodland habitats dominate the woodland vegetation types that have been targeted for corridor locations. Table 5-1 lists the woodland-based PCTs, and associated TECs, that are represented within the candidate connectivity corridors.

4.5 GLIDER CONNECTIVITY ASSESSMENT

Transgrid (July 2025) completed a review of the BDAR connectivity corridors to assess which corridors were associated with threatened gliders occurring along the HumeLink Project being Squirrel Glider, Yellow-bellied Glider and Southern Greater Glider. This drew on data from the Revised BDAR as well as BioNet Atlas records surrounding the Project area. Each corridor was then visually assessed using aerial photography, vegetation cover, and the disturbance footprint to evaluate existing connectivity and the project's impact on that connectivity.

The glider connectivity assessment identified 12 corridors where the Humelink East package will traverse habitat for Threatened Gliders. Based on the approved layout plan, three crossings were identified that are likely to require under transmission line glider poles. However, this will be reviewed through based on the final layout plans the field-based validation outlined in Section 5.1.

4.6 DISTURBANCE AREAS

The type (TCZ, ECZ and HTZ) of disturbance within each connectivity corridor have been used to inform the suitability of a corridor at a given location.

4.7 DETAILED DESIGN

As the detailed design is progressed and finalised, tower locations, and therefore connectivity corridor locations, may change. To accommodate necessary changes, each connectivity corridor will be given a determination as to whether their location is flexible (and can therefore be realigned) or fixed (and will ideally remain in place). Heritage features may also influence the final connectivity corridor locations. Opportunities for intact and/ or higher condition remnants should be prioritised for avoidance incorporating consideration of connectivity between retained remnants within and adjacent to the Project footprint must be considered in the connectivity strategy.

4.8 TRANSGRID VEGETATION CLEARANCE REQUIREMENTS

The location and management of all connectivity corridors must be in accordance with Transgrid’s VCR at Maximum Operating Conditions. Specifically, corridor locations reviewed on a site-by-site basis will need to meet the VCR as summarised below in Table 4-2.

Table 4-2. Summary vegetation clearance requirements.

Nominal system voltage	Vegetation clearance at maximum line operating conditions (min. safe working distance and regrowth rate)
500kV	3.9m + 1.5m safety buffer

5 INDICATIVE CONNECTIVITY CORRIDOR LOCATIONS

The distance between connectivity corridors differs considerably in response to identified landscape features/ factors, and where biodiversity assets are considered restricted or immovable in context to the ecological benefits sought with the establishment of a corridor. A total of 40 corridors have been identified within the Project area (Niche, 2024) (Table 5-1). Transgrid have further assessed these candidate connectivity corridors in this Strategy against proposed clearing types and extents and their associated threatened species to determine the potential ‘connectivity actions’ that can be employed within the corridor (Transgrid, June 2025). Connectivity actions refers to on ground actions that can be employed to reduce impacts to connectivity that will occur as a result of the Project (e.g. installing glider poles and ground refugia, reduced clearing and vegetation stepping-stones). In circumstances where connectivity will not be impacted within a candidate corridor, connectivity actions will only be employed where required following the results from the field-based validation surveys

Connectivity corridors provided in the revised BDAR are subject to change from review and after the final layout has been determined

Table 5-1. Candidate fauna connectivity corridors.

Unique ID	Associated Species	Existing connectivity	Impact to existing connectivity (approved clearing area)	Glider Connectivity Corridor	Ground corridor notes
INL_26_61	Greater Glider and Koala.	Fragmented vegetation corridor	Connectivity maintained	Yes	Connectivity maintained by clearing model.
INL_26_59	Greater Glider and Koala.	Intact vegetation corridor	Connectivity impact - moderate	Yes	Connectivity maintained by clearing model. Specifically, by retained vegetation to the north where INL_26_60 is located.
INL_26_60	Greater Glider and Koala.	Intact vegetation corridor	Connectivity maintained	Yes	Connectivity maintained by clearing model. Specifically, by retained vegetation to the north where INL_26_60 is located.
INL_26_58	Koala and Striped Legless Lizard.	Fragmented vegetation corridor	Connectivity impact - minor	No	Connectivity maintained by clearing model.
INL_11_57	Koala and Striped Legless Lizard.	Fragmented vegetation corridor	Connectivity impact - minor	No	Corridor of scattered paddock trees. Development will have minimal impact to existing connectivity.

Unique ID	Associated Species	Existing connectivity	Impact to existing connectivity (approved clearing area)	Glider Connectivity Corridor	Ground corridor notes
INL_11_55	Koala and Striped Legless Lizard.	Fragmented vegetation corridor	Connectivity impact - minor	No	Corridor of scattered paddock trees along Tumut River Floodplain. Development will have minimal impact to existing connectivity.
INL_10_54	Bush Stone-curlew and Koala.	Fragmented vegetation corridor	Connectivity impact - minor	No	Corridor of scattered paddock trees. Development will have minimal impact to existing connectivity.
INL_10_53	Koala.	Fragmented vegetation corridor	Connectivity impact - moderate	No	Corridor of scattered paddock trees. Development will have minimal impact to existing connectivity. Nb. Corridor linking to Mudjarn Nature Reserve
BON_1_52	Booroolong Frog and Koala.	Fragmented vegetation corridor	Connectivity impact - minor	No	Corridor traverses ridgeline and connectivity maintained by clearing model.

Unique ID	Associated Species	Existing connectivity	Impact to existing connectivity (approved clearing area)	Glider Connectivity Corridor	Ground corridor notes
BON_1_51	Eastern Pygmy-possum, Koala and Pink Robin.	Key riparian crossings	Connectivity impact - moderate	Yes	Ground corridor to follow riparian buffer.
INL_9_48	Bush Stone-curlew, Koala and Squirrel Glider.	Fragmented vegetation corridor	Connectivity impact - minor	No	Corridor along Gobarralong Adjungbilly Road. Development will have minimal impact to existing connectivity.

Unique ID	Associated Species	Existing connectivity	Impact to existing connectivity (approved clearing area)	Glider Connectivity Corridor	Ground corridor notes
INL_25_49	Booroolong Frog.	Key riparian crossings	Connectivity impact - moderate	Yes	Maintain corridor along Adjungbilly Creek riparian zone. Connectivity impacts to be reviewed against Final Layout Plans.
INL_9_4	Bush Stone-curlew and Koala.	Fragmented vegetation corridor	Connectivity impact - minor	No	Corridor of scattered paddock trees. Development will have minimal impact to existing connectivity. Minimise impact to O'Briens Creek and riparian vegetation.
INL_9_7	Bush Stone-curlew and Koala.	Fragmented vegetation corridor	Connectivity impact - minor	No	Corridor of scattered paddock trees. Development will have minimal impact to existing connectivity. Minimise impact to O'Briens Creek and riparian vegetation.
INL_7_3	Bush Stone-curlew, Koala and Striped Legless Lizard.	Fragmented vegetation corridor	Connectivity maintained	No	Corridor of scattered paddock trees along Oak Creek. Development will have minimal impact to existing connectivity.

Unique ID	Associated Species	Existing connectivity	Impact to existing connectivity (approved clearing area)	Glider Connectivity Corridor	Ground corridor notes
INL_6_5	Bush Stone-curlew and Koala.	Fragmented vegetation corridor	Connectivity maintained	No	Corridor of scattered paddock trees. Development will have minimal impact to existing connectivity.
INL_5_1	Bush Stone-curlew, Koala and Pink-tailed Legless Lizard.	Fragmented vegetation corridor	Connectivity maintained	No	Corridor of scattered paddock trees along Dicks Gully. Development will have minimal impact to existing connectivity.
INL_4_2	Bush Stone-curlew, Koala and Sloane's Froglet.	Key riparian crossings	Connectivity maintained	No	Corridor of scattered paddock trees along Murrumbidgee River Floodplain. Development will have minimal impact to existing connectivity.
MUR_7_42	Eastern Pygmy-possum, Koala, Pink-tailed Legless Lizard and Striped Legless Lizard.	Key riparian crossings	Connectivity impact - minor	No	Corridor along Wahpen Creek. Development will have minimal impact to existing connectivity.
MUR_7_41	Eastern Pygmy-possum, Koala and Pink-tailed Legless Lizard.	Key riparian crossings	Connectivity maintained	No	Corridor along Browning Creek. Development will have minimal impact to existing connectivity.
MUR_7_40	Eastern Pygmy-possum, Koala and Striped Legless Lizard.	Key riparian crossings	Connectivity impact - minor	No	Corridor along Derringully Creek. Development will have minimal impact to existing connectivity.

Unique ID	Associated Species	Existing connectivity	Impact to existing connectivity (approved clearing area)	Glider Connectivity Corridor	Ground corridor notes
MUR_6_36	Eastern Pygmy-possum, Koala, Pink-tailed Legless Lizard and Striped Legless Lizard.	Fragmented vegetation corridor	Connectivity impact - moderate	No	South of Bango Nature Reserve. Ground corridor to be established to avoid or minimise impacts to surface rock supporting known Pink-tailed Worm-lizard habitat.
MUR_5_35	Eastern Pygmy-possum, Koala and Striped Legless Lizard.	Intact vegetation corridor	Connectivity impact - minor	No	Connectivity maintained by clearing model. Multiple points where connectivity is maintained between disturbance footprint.
MUR_2_34	Eastern Pygmy-possum, Koala, Squirrel Glider and Striped Legless Lizard.	Non-functional corridor (parallel transmission lines)	Connectivity impact - moderate	Yes	Ground corridor(s) to be established within easement clearing zone to ease of corridor.

Unique ID	Associated Species	Existing connectivity	Impact to existing connectivity (approved clearing area)	Glider Connectivity Corridor	Ground corridor notes
CRO_18_33	Eastern Pygmy-possum, Koala and Pink-tailed Legless Lizard.	Fragmented vegetation corridor	Connectivity impact - minor	No	Existing connectivity for target species maintained by the clearing model. Avoid additional impacts to the surface road and potential Pink-tailed Worm-lizard habitat.
CRO_17_31	Eastern Pygmy-possum, Koala and Striped Legless Lizard.	Non-functional corridor (parallel transmission lines)	Connectivity impact - moderate	No	Maintain shrubs for small woodland birds.
CRO_12_28	Eastern Pygmy-possum, Koala, Pink-tailed Legless Lizard and Striped Legless Lizard.	Fragmented vegetation corridor	Connectivity impact - minor	No	Linear corridor along the southern side of Range Road. Assess clearing to retain shrubs and smaller mallee-form eucalypts for small woodland birds.
CRO_13_27	Eastern Pygmy-possum, Koala and Pink-tailed Legless Lizard.	Fragmented vegetation corridor	Connectivity impact - minor	No	Maintain corridor along First Creek riparian zone and avoid impacts to the existing surface rock.

Unique ID	Associated Species	Existing connectivity	Impact to existing connectivity (approved clearing area)	Glider Connectivity Corridor	Ground corridor notes
CRO_6_25	Eastern Pygmy-possum, Koala and Squirrel Glider.	Non-functional corridor (parallel transmission lines)	Connectivity impact - moderate	Yes	Connectivity maintained by clearing model.
CRO_6_24	Eastern Pygmy-possum, Koala, Pink-tailed Legless Lizard and Striped Legless Lizard.	Fragmented vegetation corridor	Connectivity impact - moderate	No	Connectivity maintained by clearing model.
CRO_4_22	Eastern Pygmy-possum, Koala and Pink-tailed Legless Lizard.	Key riparian crossings	Connectivity impact - minor	No	Connectivity maintained by clearing model along Turrallo Creek. Avoid impacts to potential Pink-tailed Worm-lizard habitat associated with surface rocks.
CRO_3_21	Eastern Pygmy-possum and Koala.	Fragmented vegetation corridor	Connectivity impact - moderate	No	Investigate establishment of ground corridor across TL61 for small woodland birds and Eastern Pygmy-possum

Unique ID	Associated Species	Existing connectivity	Impact to existing connectivity (approved clearing area)	Glider Connectivity Corridor	Ground corridor notes
CRO_2_19	Eastern Pygmy-possum, Koala and Squirrel Glider.	Non-functional corridor (parallel transmission lines)	Connectivity impact - moderate	Yes	Maintain shrubs for small woodland birds. Investigate establishment of ground corridor across TL61 for small woodland birds and Eastern Pygmy-possum.
BUN_10_18	Brush-tailed Phascogale, Eastern Pygmy-possum, Koala, Pink-tailed Legless Lizard and Stuttering Frog.	Intact vegetation corridor	Connectivity maintained	No	Connectivity maintained by the clearing model at the nominated corridor location. A supplementary ground corridor must also be assessed ~400 m to the west to maintain / established shrub stratum corridor for Eastern Pygmy-possum, Brush-tailed Phascogale and small woodland birds.
BUN_8_15	Brush-tailed Phascogale, Eastern Pygmy-possum, Koala and Pink-tailed Legless Lizard.	Fragmented vegetation corridor	Connectivity maintained	No	Existing connectivity maintained along Kerraway Creek by clearing model.

Unique ID	Associated Species	Existing connectivity	Impact to existing connectivity (approved clearing area)	Glider Connectivity Corridor	Ground corridor notes
BUN_8_14	Brush-tailed Phascogale, Eastern Pygmy-possum, Koala and Pink-tailed Legless Lizard.	Fragmented vegetation corridor	Connectivity impact - minor	No	Maintain shrubs if present for stepping stones for small woodland birds.
BUN_7_12	Brush-tailed Phascogale, Eastern Pygmy-possum, Greater Glider, Koala and Stuttering Frog.	Intact vegetation corridor	Connectivity impact - moderate	Yes	More than one ground corridor should be assessed at this location. Ground corridor should retain / reestablish dense shrub growth form cover for Eastern Pygmy-possum, Brush-tailed Phascogale and small woodland birds.
BUN_7_9	Brush-tailed Phascogale, Eastern Pygmy-possum, Greater Glider, Koala, Pink Robin and Stuttering Frog.	Intact vegetation corridor	Connectivity maintained	Yes	Existing connectivity maintained by clearing model.

Unique ID	Associated Species	Existing connectivity	Impact to existing connectivity (approved clearing area)	Glider Connectivity Corridor	Ground corridor notes
BUN_11_10	Eastern Pygmy-possum, Greater Glider, Koala and Pink-tailed Legless Lizard.	Fragmented vegetation corridor	Connectivity maintained	Yes	Connectivity impacts to be reviewed against Final Layout Plans.
BUN_6_11	Eastern Pygmy-possum, Greater Glider, Koala and Pink-tailed Legless Lizard.	Fragmented vegetation corridor	Connectivity impact - moderate	Yes	Ground corridor should be established to retain or re-establish dense shrub cover for Eastern Pygmy-possum and small woodland birds. Assess proximity to surface rock for potential Pink-tailed Worm-lizard habitat.

5.1 FURTHER STEPS TO VALIDATE MITIGATION MEASURES AT THE CONNECTIVITY CORRIDORS

Upon finalisation of the clearing limits, the conclusions and recommendations of the BMP Connectivity Review (Transgrid, July 2025) will be revisited. As part of this review, the location of the BDAR-defined connectivity corridors may be adjusted, and additional connectivity locations may be identified based on the revised footprint and ecological data. The suitability of proposed connectivity measures will be reassessed to reflect updated site conditions and clearing extents.

The targeted list of threatened species and threatened ecological communities (TECs) will be used to inform and guide the field-based validation surveys, ensuring that connectivity actions are tailored to the ecological requirements of species and communities most at risk.

5.1.1 FIELD-BASED VALIDATION

After consideration has been given to the final clearing limits, connectivity actions within each corridor will be validated by a suitably qualified ecologist with a minimum of two years' experience and hold relevant qualifications, during the pre-clearing survey. Specifically, the following process will be undertaken as part of the corridor validation survey:

- Confirm site values against priority selection principles (Section 4.2)
- Record existing habitat and heights of retained vegetation
- Identify existing stepping-stone vegetation to be retained
- Are the proposed connectivity actions appropriate for the corridor and target species? If not, is there another connectivity action that would be more appropriate?
- Confirm the target species
- Record on a GPS the spatial extent of where connectivity actions can be provided including opportunities for micro-siting
- Estimate the length of logs or amount of rocks required to provide sufficient ground habitat
- For corridors proposing glider poles, measure the height of retained vegetation and trees immediately adjacent to the disturbance zone(s) to assess pole viability and ensure glide angle requirements are met
- Assess topography (e.g. is the corridor in a valley that can accommodate tree retention?)
- Assess nearby areas for alternative corridor locations if required (e.g. shift corridor 50m west)

The field surveys will provide the rationale for any changes required that may include:

- The movement of locations as required as part of detailed design considerations to mitigate impacts
- The movement of connectivity corridors in response to changes in ground conditions (e.g., vegetation has been recently cleared, quality significantly reduced, etc.)
- The movement as a result of previously undetected barriers (e.g., new fence)

There will be no net reduction in the total number of connectivity corridors. Where the validation survey concludes the location of a connectivity corridor is unsuitable, an alternative location will be surveyed for suitability, and the corridor will be moved.

5.2 CONNECTIVITY ACTIONS WITHIN EACH CORRIDOR

5.2.1 TARGET SPECIES AND CONNECTIVITY ACTIONS

A range of connectivity actions should be explored based on the attributes of the connectivity corridor and the target species' habitat constraints. The connectivity actions, and associated threatened species (see section 2.1.1), proposed to ensure habitat connectivity within each corridor are presented below in Table 5-2. The final actions to be implemented will be confirmed once the design is finalised and field-based validation as described above is completed. Where actions cannot be implemented as proposed, alternative and/or additional actions will be investigated.

Table 5-2. Actions taken to ensure habitat connectivity within each corridor.

Actions	Target group
Design vegetation/ remnant stepping-stones	Terrestrial and arboreal mammals, woodland birds, forest owls and cockatoos, bats and raptors
Design refinement	All threatened species and TECs

Actions	Target group
Design and installation of ground refugia (creation and re-use of timber/ logs as habitat)	Terrestrial mammals, reptiles
Reduced vegetation clearance	All threatened species and TECs
Artificial connectivity structures (glider poles)	Gliding mammals (see section 6)
Spanning of infrastructure above canopy (avoidance of clearing)	All threatened species and TECs

6 GLIDER POLES

The BMP Connectivity Review (Transgrid, July 2024) identified 12 glider connectivity corridors in HumeLink East. Based on the approved clearing footprint, three of these crossings are likely to require under transmission line glider poles to maintain connectivity across HumeLink:

- CRO_6_25
- CRO_2_19
- BUN_7_12

Two additional crossings may also require under transmission line glider poles based on the field verification surveys:

- BON_1_51
- INL_25_49.

The remaining glider crossings in HumeLink East are expected to have glider connectivity maintained based on the clearing model at or near to the nominated connectivity corridor. These recommendations are summarised in Table 6-1. The conclusion of the BMP Connectivity Review (Transgrid, July 2024) will be reviewed through the field-based verification process outlined in Section 5.1.1.

Table 6-1. Proposed glider corridor locations and fauna sensitive structures.

Case No.			Case Name	Case Description	Case Status	Case Type
1			Case 1	Case 1 Description	Case 1 Status	Case 1 Type
2			Case 2	Case 2 Description	Case 2 Status	Case 2 Type
3			Case 3	Case 3 Description	Case 3 Status	Case 3 Type
4			Case 4	Case 4 Description	Case 4 Status	Case 4 Type
5			Case 5	Case 5 Description	Case 5 Status	Case 5 Type
6			Case 6	Case 6 Description	Case 6 Status	Case 6 Type
7			Case 7	Case 7 Description	Case 7 Status	Case 7 Type
8			Case 8	Case 8 Description	Case 8 Status	Case 8 Type
9			Case 9	Case 9 Description	Case 9 Status	Case 9 Type
10			Case 10	Case 10 Description	Case 10 Status	Case 10 Type
11			Case 11	Case 11 Description	Case 11 Status	Case 11 Type
12			Case 12	Case 12 Description	Case 12 Status	Case 12 Type
13			Case 13	Case 13 Description	Case 13 Status	Case 13 Type
14			Case 14	Case 14 Description	Case 14 Status	Case 14 Type
15			Case 15	Case 15 Description	Case 15 Status	Case 15 Type
16			Case 16	Case 16 Description	Case 16 Status	Case 16 Type
17			Case 17	Case 17 Description	Case 17 Status	Case 17 Type
18			Case 18	Case 18 Description	Case 18 Status	Case 18 Type
19			Case 19	Case 19 Description	Case 19 Status	Case 19 Type
20			Case 20	Case 20 Description	Case 20 Status	Case 20 Type
21			Case 21	Case 21 Description	Case 21 Status	Case 21 Type
22			Case 22	Case 22 Description	Case 22 Status	Case 22 Type
23			Case 23	Case 23 Description	Case 23 Status	Case 23 Type
24			Case 24	Case 24 Description	Case 24 Status	Case 24 Type
25			Case 25	Case 25 Description	Case 25 Status	Case 25 Type
26			Case 26	Case 26 Description	Case 26 Status	Case 26 Type
27			Case 27	Case 27 Description	Case 27 Status	Case 27 Type
28			Case 28	Case 28 Description	Case 28 Status	Case 28 Type
29			Case 29	Case 29 Description	Case 29 Status	Case 29 Type
30			Case 30	Case 30 Description	Case 30 Status	Case 30 Type
31			Case 31	Case 31 Description	Case 31 Status	Case 31 Type
32			Case 32	Case 32 Description	Case 32 Status	Case 32 Type
33			Case 33	Case 33 Description	Case 33 Status	Case 33 Type
34			Case 34	Case 34 Description	Case 34 Status	Case 34 Type
35			Case 35	Case 35 Description	Case 35 Status	Case 35 Type
36			Case 36	Case 36 Description	Case 36 Status	Case 36 Type
37			Case 37	Case 37 Description	Case 37 Status	Case 37 Type
38			Case 38	Case 38 Description	Case 38 Status	Case 38 Type
39			Case 39	Case 39 Description	Case 39 Status	Case 39 Type
40			Case 40	Case 40 Description	Case 40 Status	Case 40 Type
41			Case 41	Case 41 Description	Case 41 Status	Case 41 Type
42			Case 42	Case 42 Description	Case 42 Status	Case 42 Type
43			Case 43	Case 43 Description	Case 43 Status	Case 43 Type
44			Case 44	Case 44 Description	Case 44 Status	Case 44 Type
45			Case 45	Case 45 Description	Case 45 Status	Case 45 Type
46			Case 46	Case 46 Description	Case 46 Status	Case 46 Type
47			Case 47	Case 47 Description	Case 47 Status	Case 47 Type
48			Case 48	Case 48 Description	Case 48 Status	Case 48 Type
49			Case 49	Case 49 Description	Case 49 Status	Case 49 Type
50			Case 50	Case 50 Description	Case 50 Status	Case 50 Type
51			Case 51	Case 51 Description	Case 51 Status	Case 51 Type
52			Case 52	Case 52 Description	Case 52 Status	Case 52 Type
53			Case 53	Case 53 Description	Case 53 Status	Case 53 Type
54			Case 54	Case 54 Description	Case 54 Status	Case 54 Type
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56			Case 56	Case 56 Description	Case 56 Status	Case 56 Type
57			Case 57	Case 57 Description	Case 57 Status	Case 57 Type
58			Case 58	Case 58 Description	Case 58 Status	Case 58 Type
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60			Case 60	Case 60 Description	Case 60 Status	Case 60 Type
61			Case 61	Case 61 Description	Case 61 Status	Case 61 Type
62			Case 62	Case 62 Description	Case 62 Status	Case 62 Type
63			Case 63	Case 63 Description	Case 63 Status	Case 63 Type
64			Case 64	Case 64 Description	Case 64 Status	Case 64 Type
65			Case 65	Case 65 Description	Case 65 Status	Case 65 Type
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72			Case 72	Case 72 Description	Case 72 Status	Case 72 Type
73			Case 73	Case 73 Description	Case 73 Status	Case 73 Type
74			Case 74	Case 74 Description	Case 74 Status	Case 74 Type
75			Case 75	Case 75 Description	Case 75 Status	Case 75 Type
76			Case 76	Case 76 Description	Case 76 Status	Case 76 Type
77			Case 77	Case 77 Description	Case 77 Status	Case 77 Type
78			Case 78	Case 78 Description	Case 78 Status	Case 78 Type
79			Case 79	Case 79 Description	Case 79 Status	Case 79 Type
80			Case 80	Case 80 Description	Case 80 Status	Case 80 Type
81			Case 81	Case 81 Description	Case 81 Status	Case 81 Type
82			Case 82	Case 82 Description	Case 82 Status	Case 82 Type
83			Case 83	Case 83 Description	Case 83 Status	Case 83 Type
84			Case 84	Case 84 Description	Case 84 Status	Case 84 Type
85			Case 85	Case 85 Description	Case 85 Status	Case 85 Type
86			Case 86	Case 86 Description	Case 86 Status	Case 86 Type
87			Case 87	Case 87 Description	Case 87 Status	Case 87 Type
88			Case 88	Case 88 Description	Case 88 Status	Case 88 Type
89			Case 89	Case 89 Description	Case 89 Status	Case 89 Type
90			Case 90	Case 90 Description	Case 90 Status	Case 90 Type
91			Case 91	Case 91 Description	Case 91 Status	Case 91 Type
92			Case 92	Case 92 Description	Case 92 Status	Case 92 Type
93			Case 93	Case 93 Description	Case 93 Status	Case 93 Type
94			Case 94	Case 94 Description	Case 94 Status	Case 94 Type
95			Case 95	Case 95 Description	Case 95 Status	Case 95 Type
96			Case 96	Case 96 Description	Case 96 Status	Case 96 Type
97			Case 97	Case 97 Description	Case 97 Status	Case 97 Type
98			Case 98	Case 98 Description	Case 98 Status	Case 98 Type
99			Case 99	Case 99 Description	Case 99 Status	Case 99 Type
100			Case 100	Case 100 Description	Case 100 Status	Case 100 Type

[illegible]

[illegible]

Corridor ID	Known Glider Activity	Vegetation disturbance	Existing Connectivity	Requirement for under transmission line glider poles	Glider
					on e traverse
BUN_7_12	Greater Glider	moderate y impact -	Intact vegetation corridor	Likely	der nt. at for ent in at local on an or gullies to the east.

Corridor ID	Known Glider Activity	Vegetation disturbance	Existing Connectivity	Requirement for under transmission line glider poles	Glider crossings justification
[Redacted]					

[Redacted]					
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Should trees under-transmission be unable to provide the required connectivity for gliders, man-made glider poles will be installed as an alternative. An example of what these man-made glider poles could look like is reflected in Figure 14. Glider poles should be to a height that will support connectivity for each of the three potentially occurring glider species and include a launch pad and predator shield. The exact height and arrangement of glider poles across the easement will be determined following the field-validation surveys.

6.1 GLIDER POLE LOCATIONS

Preliminary glider pole locations have been suggested in Table 6-1. The number of poles required to bridge the crossing is dependent on the height of the poles which is in turn dependent on both the topography at the crossing location and the allowable height in relation to the low sway height of the wires.

The following parameters should be explored when considering the final glider pole locations:

- Evidence of gliders prior to clearing at these locations (e.g. suitable breeding habitat, previous glider records)
- Sufficient adjoining glider habitat in near proximity to the crossing points
- Species specific statistics on glide angles, distances, heights
- Zig zag / offset pole placement not considered a particular advantage, but may facilitate placement in uneven topography at crossing point, to maximise launch heights
- Being located outside tower pad clear zones, and within ECZ zones
- Avoiding the low sway areas
- Slope and aspect
- Avoiding the switching station area (to minimise collision with security fencing)
- Height of trees to adjacent vegetation should be maximised and taken into account when choosing location of the first pole in each array
- Glide poles need to be located along the easement where the pole height is suitable for the species to reach the other side. i.e. Ability to glide to the next pole and launch from a suitable height.

6.2 CALCULATING THE HEIGHT OF UNDER TRANSMISSION LINE GLIDER POLES

The Glider Assessment (Niche 2023) stipulated that Yellow-bellied Glider and Southern Greater Glider are morphologically similar in size and therefore the Yellow-bellied Glider average glide angle of 27.3 degrees (average glide ratio of 2) (Goldingay 2014) is representative of Southern Greater Gliders. However, Transgrid have since sought species-specific advice from Dr Ana Gracanin, a Research Fellow at The Australian National University. According to Dr Gracanin's research, Southern Greater Gliders have a significantly steeper glide angle compared to Yellow-bellied Gliders, with an average glide angle of 44.6 degrees (average glide ratio of 1.04). Squirrel Gliders are smaller and have an average glide angle of 28.5 degrees (Goldingay and Taylor 2009) (average glide ratio of 1.84). The average glide angles and ratios for each species are summarised in Table 6-2.

Table 6-2. Summarised Glider species average glide angles and ratios.

Glider Species	Average Horizontal Glide Distance (m)	Average Glide Height Drop (m)	Average Glide Angle (degrees)	Average Glide Ratio
Squirrel Glider (Goldingay and Taylor 2009)	21.5	11.7	28.5	1.84
Yellow-bellied Glider (Goldingay 2014)	25.2	12.7	27.3	2.00
Southern Greater Glider (Dr Gracanin, personal communication, 2025)	*	*	44.6	1.04

* Data unavailable.

The assessment also noted that Gliders typically launch from 2 to 3m below canopy height and land at least 5m above the ground (Goldingay 2014; Goldingay and Taylor 2009; Jackson 2002). Figure 13 illustrates the average glide ratio for each glider species. Figure 14 reflects a potential arrangement for under-transmission line glider poles.

The height of trees at the edges of the easement will allow a greater glide distance to be achieved from forest edge to first pole but will need to be determined with detailed field measurements at the proposed crossing locations, and conversely, crossing locations may need to be adjusted to better align with the location of taller trees to maximise the gap that can be crossed, and thereby minimise the number of poles required.

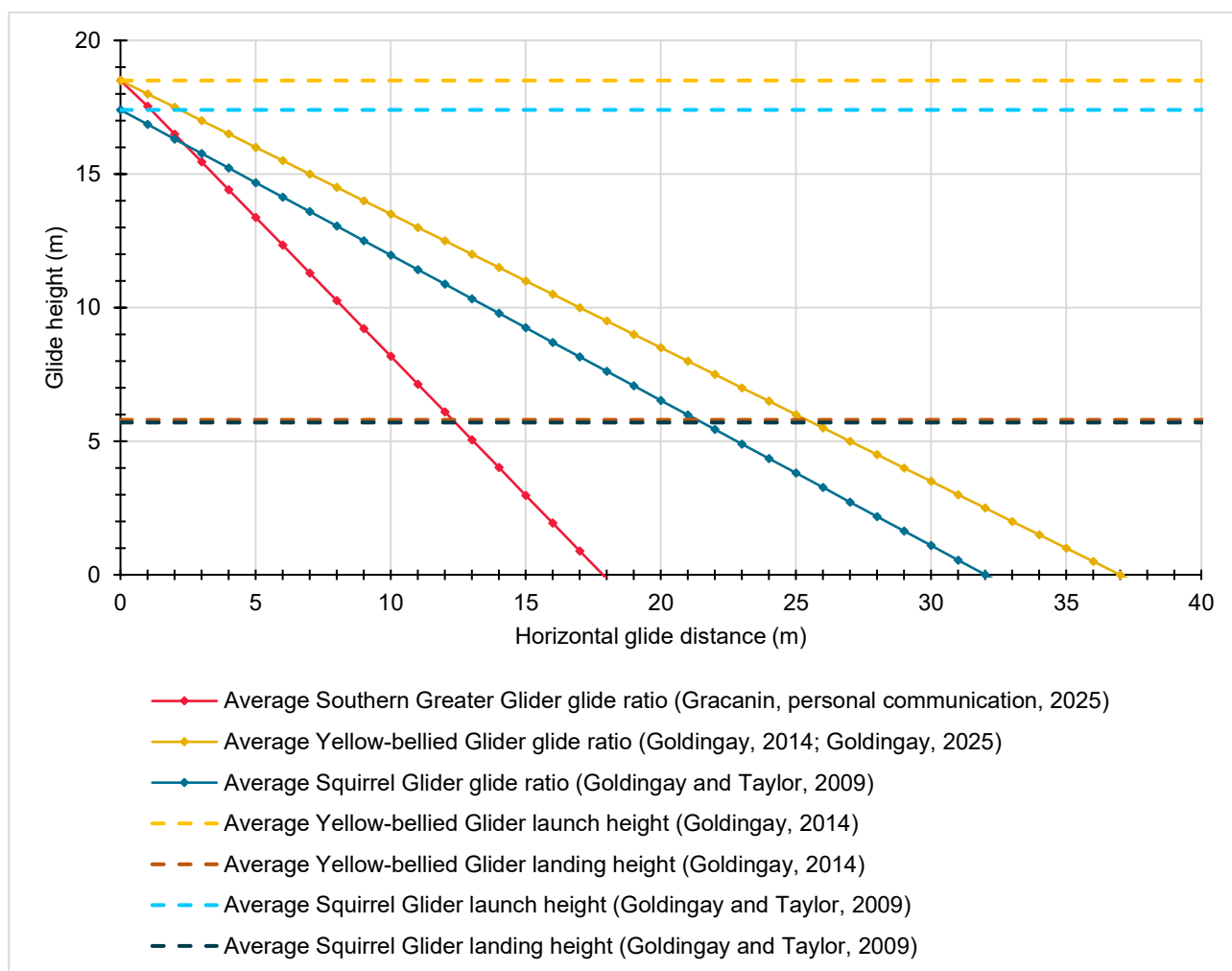


Figure 13. Average glide ration (horizontal distance/height dropped) of Southern Greater Glider, Yellow-bellied Glider and Squirrel Glider.

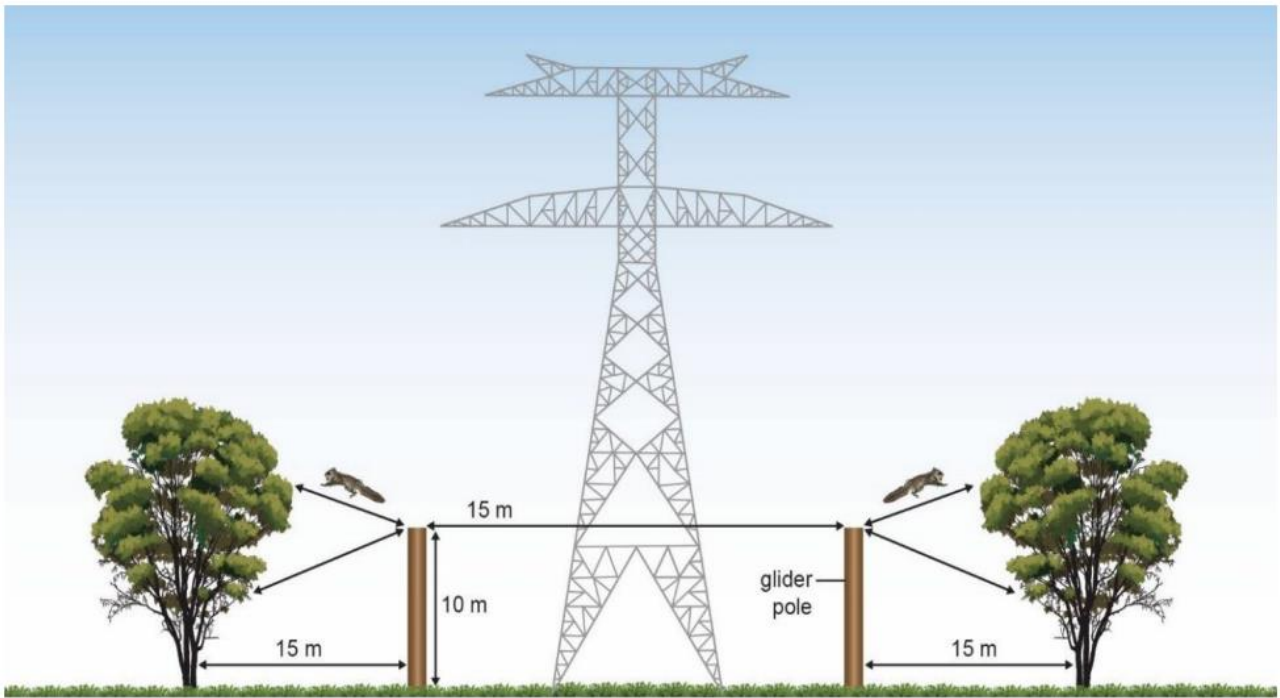


Figure 14. Potential under-transmission line glider poles arrangement.

6.3 GLIDER POLE FINAL DESIGN PROCESS

Based on species-specific glide behaviour, the site inspections, and the field verification reports, site-specific designs for each glider array will be prepared in consultation with Department of Climate Change, Energy, the Environment and Water (DCCEEW) glider experts to determine the final height of glider poles at each location. The spacing of glider poles will be dependent on the height of glider poles, the number of glider poles required, per section 6.1, and on the species-specific glide angles outlined in section 6.2.

Completed site-specific glider pole designs will be provided to CHPR for approval, prior to installation commencing. The CPHR glider expert will be invited to inspect the proposed glider pole sites to review the Project Ecologist's conclusions before detailed design is finalised. It is preferred that a CPHR glider expert is present at on-site field validation surveys for all potential glider crossing locations to ensure that infrastructure placement is informed by expert assessment of habitat features and species movement patterns. To facilitate this, the project ecologists will provide a schedule of field surveys involving Glider Crossings two weeks ahead of surveys occurring to allow for scheduling and facilitate their access to site. Where connectivity corridors overlap with habitat for candidate raptor or parrot species as per the Revised BDAR, bird deterrents will be included as a mitigation measure.

6.4 GLIDER POLE MONITORING AND INSTALLATION

Glider pole monitoring is discussed in Appendix H Flora and Fauna Monitoring Program.

Ground corridors, glider pole crossings, and other connectivity infrastructure will be installed within three months of clearing the connectivity corridor.

7 BIRD DETERRENT MEASURES

TransGrid will undertake a review of the risk of collision with transmission lines by highly mobile species including threatened Forest Owls, Raptors and Cockatoos, Migratory Birds, Grey-headed Flying-fox and microbats and gliders to determine the location and type of adaptive management measures for collision-risk species. Deterrent strategies would include bird flappers and perching deterrents to deter avifauna effectively and safely away from energized infrastructure, development of a diverter model and a monitoring program.

The review will be completed in consultation with CPHR within six months of the commencement of construction. The outcomes of the review of the risk of collision would be incorporated into the Connectivity Strategy in the BMP prior to the commencement of stringing.

To minimise the risk of bird and bat collisions with transmission lines, TransGrid will prepare a Conductor Line-Marking Plan in consultation with CPHR prior to the commencement of stringing and it will be appended to this strategy. The plan will be spatially explicit and will identify all high-risk spans ('hot-spots'), device type, placement, and spacing.

7.1 CONDUCTOR LINE-MARKING AND COLLISION RISK MANAGEMENT

Within six months of construction commencement, Transgrid will undertake a review of collision risk for highly mobile and collision-prone species, including:

- Threatened forest owls, raptors, cockatoos
- Migratory birds
- Grey-headed Flying-fox
- Microbats and gliders

The review will incorporate:

- Updated species distribution data (including BDAR records, BAVR survey records and Bionet records within 10km)
- Mapped high-risk landforms and habitats (e.g. riparian corridors, ridge-to-ridge spans, wetlands, known roosts/nests, connectivity corridors, riparian corridors)
- Records of stick nests or communal roosts identified during pre-clearing surveys
- Background and visibility factors (e.g. forested backdrops, low-light/fog-prone areas)

The review will be documented in a Final Connectivity Report that forms an appendix to the BMP and/or relevant section. This report will:

- Identify the final locations of all ground and glider corridors.
- Provide specifications for each corridor, including width, Plant Community Type (PCT), and details of connectivity enhancement measures installed (e.g. glider poles, rock piles, supplementary planting).
- Confirm locations where bird/bat deterrent measures (conductor line markers) will be installed, applying clear spatial parameters:
 - Connectivity corridors, riparian crossings and 250 m either side of both these types of environmental features
 - 500 m from significant water bodies
 - 1 km from large wetlands, estuaries, or known roost/nest complexes
- Detail protection measures, maintenance requirements, and monitoring commitments.

7.1.1 DIVERTER INSTALLATION

Diverter to be installed during stringing or immediately after completion of stringing for each high-risk span (no later than a month). Priority will be given to marking the overhead earth wire; the uppermost phase will also be marked if collision risk remains high.

Diverter will be installed on:

- All spans crossing mapped riparian corridors or within 500m of significant water bodies
- Ridge-to-ridge or valley funnel spans used as known flightlines
- Spans within 1 km of active raptor or large bird nests or bat roosts where flight paths intersect the alignment
- Any span with recorded collisions or similar habitat characteristics to known incident sites
- Ground and glider corridors identified in the Connectivity Strategy
- Spans where stick nests are identified during pre-clearing surveys

Device type will be selected to suit target species and site conditions:

- Large high-contrast flappers or swinging plates for raptors and large waterbirds
- Reflective or luminous elements in low-light backdrops

Spacing for deterrents will be $\leq 10\text{--}15$ m for high-risk spans; with increased density were recommended by the manufacturer for enhanced movement-based visibility.

7.1.2 DIVERTER MONITORING AND ADAPTIVE MANAGEMENT

Monitoring will be completed of performance measures post installation of bird deterrents, along with the connectivity corridor monitoring and identified 'hot spot' areas e.g. close to recorded stick nests or known raptor flightlines. Monitoring will also include carcass searches.

If collision incidents persist above a defined threshold (to be set in consultation with CPHR) the adaptive measures will include increasing device density, mark additional wires, or extend treated span length during the next de-energisation period.

8 REPORTING

A Corridor Validation Report (CVR) will be prepared following the field-based validation surveys to document the results of the surveys and provide recommendations for connectivity actions. The CVR will include:

- Corridor ID
- Updated assessment of the condition of the vegetation within the corridor
- Presence of existing habitat features
- Recommended connectivity actions and target species
- Precise location and extent of connectivity actions, as well as estimated length and amount of ground refugia required to be placed to facilitate movement
- Recommended height, location and arrangement of glider poles
- Spatial details of stepping-stone vegetation retained to support fauna movement
- Spatial details of micrositeing to avoid impacting higher quality habitat
- Maps of retained vegetation to demonstrate connectivity across the project footprint
- Demonstrate how the objectives of the Connectivity Strategy and the 29 July 2025 Connectivity Corridor Review letter have been met.
- Provide recommendations for protecting connectivity corridors during and after construction, including the placement of any connectivity enhancement features and how connectivity will be maintained for glider species in the locations of glider poles prior to their installation (e.g., through retention of vegetation).
- Diverter monitoring as per Section 7.1.2

This report will be provided to Transgrid and CPHR prior to clearing at the corridor locations.

APPENDIX G: THREATENED INSECT HABITAT REHABILITATION PLAN

HumeLink East



Threatened Insect Habitat Rehabilitation Plan

HLE-AGJ-ENV-ALE-PLN-0000-00006 | Rev 02

I. APPROVALS

	Name	Signature	Date
Author:	[REDACTED]	[REDACTED]	14/04/2025
Sponsor:	[REDACTED]	[REDACTED]	14/04/2025
Project Director:	[REDACTED]	[REDACTED]	14/04/2025

The authorised use of this document shall only be once approved by way of presence of signatories under section above.

II. DOCUMENT CONTROL – REVISION HISTORY

Rev	Date	Pages	Revised by	Description
A	3/04/2024	All	[REDACTED]	For submission to Transgrid
B	3/04/2024	All	[REDACTED]	For submission to Transgrid
C	17/07/2024	All	[REDACTED]	Updated for Amendment Report and Revised BDAR. For submission to Transgrid
D	14/08/2024	All	[REDACTED]	Update to address Transgrid comments
00	19/08/2024	Nil		IFU
01.1	29/11/2024	All	[REDACTED]	Updated for Revised BDAR (Rev 00), CoA and to address Transgrid Additional Ecological Surveys Briefing Note and BCS Comments
01.2	14/04/2025	All	[REDACTED]	Minor updates to address CPHR and ER comments
02	15/09/2025	Nil		Issued for Use

GENERAL REQUIREMENTS

The Project Director is responsible for the distribution of this Management Plan. The controlled master version of this document is available for distribution as appropriate and maintained on RIB | CX. All circulated hard copies of this document are deemed to be uncontrolled. The implementation of this Management Plan is under the authority of AGJV and the Project Director. All personnel employed on the Project will perform their duties in accordance with the requirements of this Management Plan, supporting management plans, and related procedures.

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1. INTRODUCTION

This Threatened Insect Habitat Rehabilitation Plan (Plan) is an appendix to the Biodiversity Management Sub-plan (BMP) which forms part of the Construction Environmental Management Plan (CEMP) for the HumeLink East project (the Project). Acciona Genus Joint Venture (AG JV) has been contracted to deliver the Project. Refer to the Biodiversity Management Plan (BMP) for the glossary, references & compliance against relevant Conditions of Approval (CoA) and Updated Mitigation Measures (UMMs).

1.1 PURPOSE

This Plan details the process for rehabilitating Golden Sun Moth (GSM) and Key's Matchstick Grasshopper (KMG) habitat that has been temporarily disturbed during construction. This Plan has been prepared in accordance with the requirements of UMM B3 and B9 and CoA B30.

This Plan has been prepared by Principal Ecologist [REDACTED] Sc (Biology), Grad. Dip. (Bushfire Protection) and Dr [REDACTED] BSc (Zoology & Entomology), Hons (Zoology), PhD (Ecology).

1.2 SCOPE AND OBJECTIVES

This Plan will be implemented for all areas that are temporarily disturbed during construction in mapped GSM and KMG habitat however, rehabilitation actions in specific locations will be subject to their future use (i.e. temporary or permanent disturbance) and are subject to agreement of the relevant landowner. This Plan details the planting specifications and requirements for post-care (maintenance), including weed control.

The objectives of this Plan are to:

- Rehabilitate temporarily disturbed GSM and KMG habitat, by incorporating seeding without the use of fertiliser
- Manage weeds in GSM and KMG habitat adjacent to rehabilitation sites within the Project footprint to increase habitat quality
- Outline planting specifications and requirements for post-care, including weed control

All monitoring and reporting required for this Plan will be undertaken in accordance with Section 8 of the BMP.

1.3 INDUCTION/TRAINING

All Project personnel are to be inducted on the existence of this Plan during the Project Induction and in more detail as required in Site Inductions and regular Toolbox Talks. All personnel managing and using pesticides will be appropriately licensed as per the *Pesticides Act 1999* (NSW) and receive appropriate training prior to commencing work specifically where it targets Chilean Needle Grass and other GSM and KMG habitats. Records of all training, including inductions, will be maintained. Records will include the name and role of the attendee, the date of training/induction as well as the name of the course.

1.4 ROLES AND RESPONSABILITIES

The Project Team's organisational structure and overall roles and responsibilities are outlined in Section 3.5 of the CEMP. Specific responsibilities for the implementation of environmental controls are detailed in Table 29 of the BMP.

1.5 RELEVANT DOCUMENTS, GUIDELINES AND SPECIFICATIONS

This Plan has been prepared with consideration of the following:

- Background Paper to EPBC Act Policy Statement 3.12 – Significant Impact Guidelines for the Critically Endangered Golden Sun Moth (*Synemon plana*) (DEWHA, 2009)
- Conservation Advice for *Synemon plana* (Golden Sun Moth) (DAWE, 2021)
- Conservation Advice for *Keyacris scurra* (Key's Matchstick Grasshopper) (DAWE, 2022)
- Draft NSW and National Recovery Plan for the Golden Sun Moth *Synemon plana* (DEC, 2007)
- Golden Sun Moth – endangered species listing. NSW Scientific Committee – final determination (DECCW, 1996)

- Key's Matchstick Grasshopper – endangered species listing. NSW Scientific Committee – final determination (DECCW, 1996)
- Significant Impact Guidelines for the Critically Endangered Golden Sun Moth (*Synemon plana*) (DEWHA, 2009)
- Threatened species: Golden Sun Moth – profile (DCCEEW, 2024)
- Threatened species: Key's Matchstick Grasshopper – profile (DCCEEW, 2024)

Acciona Genus JV acknowledges Niche, specifically sub-consultant Alison Rowell (GSM Species Expert), for authorship of the HumeLink Project – Golden Sun Moth Expert Report June 2024 and Hiromi Yagui and Michael Kearney (KMG Species Experts) for authorship of the HumeLink Project – Key Matchstick Grasshopper Expert Report February 2024 submitted as a part of the Revised BDAR (EIS Technical Report 1 - Biodiversity Development Assessment Report 21 June 2024).

This Plan has adopted the findings of the Expert Reports and added new sections where appropriate.

2. GOLDEN SUN MOTH (*SYNEMON PLANA*)

2.1 STATUS

The Golden Sun Moth (*Synemon plana*) is listed as Vulnerable under the *Biodiversity Conservation Act 2016* (NSW) (BC Act) and the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

2.2 DESCRIPTION

Male GSM Size: Wingspan around 34 mm (3.4cm) Colour: Upper wings grey/brown with paler patterns. Hindwings are bronze/brown.	Female GSM Size: Wingspan less than 34mm (3.4cm) Colour: Upper wings dark grey with paler patterns. Hindwings are bright orange/yellow with black spots and a distinct pale edge.
	
	
Figure 1. Male GSM, female GSM and caterpillar of this species, which is off-white with a black head and a red collar. (Photo: courtesy of David McClenaghan, CSIRO)	

2.3 LIFE CYCLE

GSM larvae primarily feed on the underground portions of wallaby grasses (*Rytidosperma* spp.), and to a lesser extent Speargrasses (*Austrostipa* spp.). Larvae are cream-coloured and late instars have a red-brown head capsule. The larvae pupate after developing for 1-2 years underground, and adults emerge on warm dry sunny days in spring and early summer, leaving the upper half of the empty red-brown pupal cases protruding from the soil near tussock bases. Adults have a brief lifespan of one to four days and do not feed as they do not have functional mouthparts. During sunny and warm conditions, male moths actively patrol grasslands throughout the day in pursuit of females. Females have limited flying capabilities due to their smaller hindwings. The onset and duration of the flight season varies from year to year, likely influenced by weather conditions, starting earlier in warm and dry springs. The flight period in ACT/NSW populations is usually between mid-October and early January, with a peak from mid-November to early December.

2.4 HABITAT

GSM has been recorded in native grasslands, native pasture, open woodlands with a grassy understorey and secondary grasslands containing wallaby grass (*Rytidosperma* spp.) and speargrass (*Austrostipa* spp.) as well as in degraded grasslands dominated by the exotic Chilean needlegrass (*Nassella nessiana*), a weed of national significance (DAWE, 2009). Diagnostic features of specific grasses associated with GSM are detailed in Table 1

Table 1 Diagnostic features of key grasses associated with GSM.

Genus	Description	Image
<i>Rytidosperma</i> spp. (Wallaby Grass)	Tufted perennials. Ligule ciliate rim; blade folded in bud, flat or convolute, usually narrow and often hairy, long hairs usually present at orifice. Inflorescence is an open to spike-like and contracted panicle (occasionally a raceme) with a few spikelets, white or pale at maturity.	 An example of a <i>Rytidosperma</i> species (<i>R. caespitosum</i>)
<i>Austrostipa</i> spp. (Speargrass)	Perennials (rarely annuals) of various habits. Auricles often present, sometimes one-sided, grading into a usually membranous ligule. Blade rolled or folded in bud, convolute, terete or flat, usually scabrous or hairy. Inflorescence is an open or contracted panicle, axis persistent or falling as a whole.	 An example of an <i>Austrostipa</i> species (<i>A. ramosissima</i>)

Genus	Description	Image
<i>Nassella neesiana</i> (Needlegrass)	Weed Caespitose perennial to c. 0.8 (-1.2) m high. Leaves with ligule sometimes almost absent on lower leaves, otherwise truncate to obtuse, membranous, 0.5–3 mm long, with tufts of hairs at the sides; auricles thickened, sparsely hairy to glabrous; blade expanded to loosely inrolled, 2–2.5 mm wide, hirsute, margins scabrous.	



Figure 2. An example of Natural Temperate Grassland (NTG), that provides habitat for GSM and KMG (Photo: DPE, 2023)

GSM was not detected during field surveys however; it is assumed present as it has a high likelihood of occurrence and is known to occur in the Murrumbateman and Inland Slopes IBRA subregions due to the presence of suitable grassland habitat and with multiple sightings across records within 5 kilometres of the project footprint in suitable grassland habitat. The project would result in the loss of approximately 30.54 ha of foraging and breeding habitat for the GSM (including 3.06 ha of prescribed impacts on non-native habitat) within the construction boundary.

The following parameters were identified to predict potential GSM habitat using expert advice and survey data. The full methodology can be found in the in the BDAR (Niche, 2024).

Table 2. Parameters for identifying potential Golden Sun Moth habitats - adapted from Revised BDAR (Niche, 2024)

Criteria	Potential Golden Sun Moth Habitat
Land use	Habitat excludes unsuitable land uses based on cross reference with NSW Land Use 2017 (NSW DCCEEW, 2019b) layer and aerial photo interpretation. This includes lands subject to ploughing, cropping, recent/ frequent superphosphate application or pasture improvement resulting in continuous cover of pasture species such as <i>Phalaris</i>, <i>Lolium</i>, and <i>Subterranean Clover</i>.
Shading	Grasslands and woodlands supporting less than 10 per cent canopy or midstorey cover.
Floristics	- Patch does not support dense cover of negative indicator species such as <i>Microlaena stipoides</i> or <i>Themeda triandra</i>, or species associated with forest or dense woodland communities such as <i>Rytidosperma pallidum</i>, <i>Austrostipa densiflora</i>, <i>Wahlenbergia stricta</i>, <i>Lomandra multiflora</i>, <i>L. longifolia</i>, <i>Hardenbergia violacea</i>, <i>Dianella revoluta</i>, <i>Cheiranthra</i> and <i>Patersonia</i> sp. - Patch supports more than 10% cover of suitable larval food plants such as <i>Rytidosperma carphoides</i>, <i>R. auriculatum</i>, <i>R. laeve</i>, <i>Austrostipa bigeniculata</i> and <i>A. scabra</i>. <i>R. caespitosum</i>, <i>R. setaceum</i>, <i>R. erianthum</i>, <i>R. racemosum</i> and <i>Bothriochloa macra</i>. - Patch contains native forbs associated with Natural Temperate Grasslands.
Bare ground/litter cover/exotic broadleaf	- Greater than 3% bare ground - Less than 25% litter cover - Less than 10% exotic broadleaf cover

2.5 DISTRIBUTION

Prior to European settlement, GSM were widespread in native grasslands in south-eastern Australia, from near Bathurst in New South Wales through the Australian Capital Territory and Victoria to Bordertown in South Australia (Edwards, 1993; 1994). This distribution was correlated with grasslands dominated by low-growing wallaby grasses (*Rytidosperma* spp.) and has contracted substantially since European settlement due to habitat loss, fragmentation and degradation (O'Dwyer & Attiwill, 1999). As a result, GSM are now only found in a few relatively small breeding areas including within the Murrumbateman subregion and Inland Slopes subregion of the HumeLink project.

GSM distribution in NSW and the project area is shown in Figure 3. The location of GSM habitat (species polygons) in the Project footprint per the Revised BDAR is provided in Attachment 1.

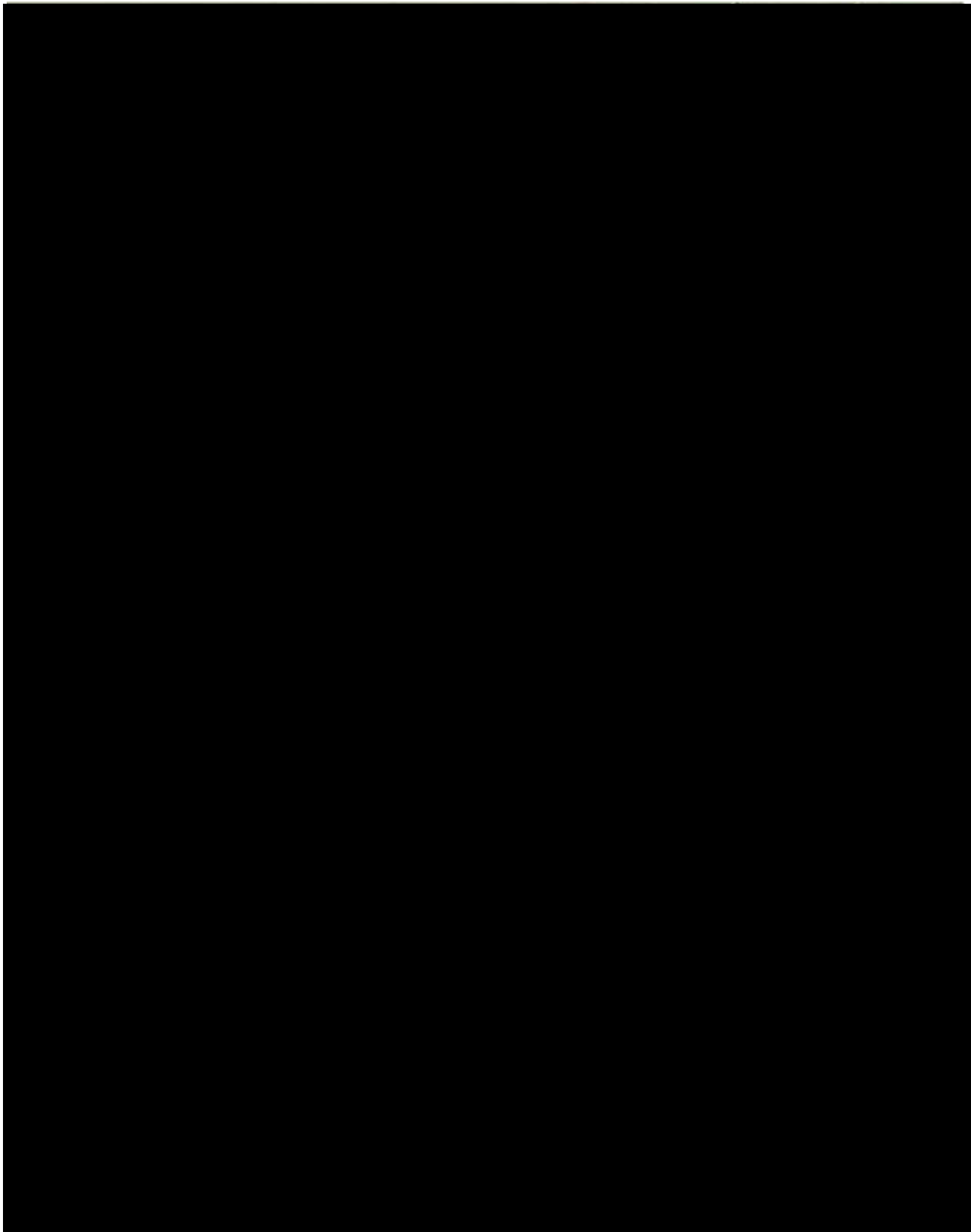


Figure 3. GSM distribution in NSW and the project area (from NSW BioNet Atlas Database)

3. KEY MATCHSTICK GRASSHOPPER (*KEYACRIS SCURRA*)

3.1 STATUS

The Key Matchstick Grasshopper (*Keyacris scurra*) is listed as Endangered under the BC Act and the EPBC Act.

3.2 DESCRIPTION

Small, slender, wingless grasshopper characterised by its slanted face, splayed hind femora (longest segment of the hind leg) and sword-shaped antennae.

Size: Small. Females are approximately 25 mm and males are approximately 18 mm.

Colour: Occurs in several colour forms, with brown and green being the most common



3.3 LIFE CYCLE

KMG have only one generation per year and generations do not overlap. The eggs are buried in the soil and hatch in December and January, becoming adults in May (males) and spring (females). Mating occurs as soon as the females reach adulthood and lasts until the end of November.

3.4 HABITAT

Suitable habitat for KMG typically encompasses native grasslands and grassy woodland, such as Natural Temperate Grasslands (NTG), characterised by Kangaroo Grass (*Themeda triandra*) (not considered a food plant) alongside areas with everlasting daisies (*Chrysocephalum apiculatum*), and Clustered Everlasting (*C. semipapposum*), and yellow buttons of the genus *Leptorhynchus* that provide food. Other known food plants are species of the genus *Plantago* (native and introduced) and *Acaena*. Observing the presence of certain food plants or specific habitat features can serve as strong indicators of the species' presence in an area.

Unfavourable habitat conditions encompass high levels of disturbance (e.g. mowed areas), absence of necessary resources (e.g. only Kangaroo grass but not food plants), or shadowy areas. Degree of disturbance appears to be an important determinant of site occupancy and it appears to be absent from sites that are disturbed during inappropriate times of the year (and interrupt the short non-overlapping lifecycle) or have been subjected to erratic management (e.g., periods of over and under grazing) (TSSC, 2022). Diagnostic features of key grasses associated with KMG are detailed in Table 3.

Table 3. Diagnostic features of key grasses associated with KMG.

Genus	Description	Image
Kangaroo Grass (<i>Themeda triandra</i>)	Densely caespitose, leafy perennials, to c. 1.2 m tall. Nodes are usually glabrous and sometimes pruinose, or occasionally densely pubescent. Lower sheaths glabrous to densely villous with appressed or spreading hairs; ligule very short, truncate, jagged, breaking up into minute cilia; blade 2–5 mm wide, usually glabrous but occasionally margined with tubercle-based hairs. Inflorescence is usually more or less obovate, interrupted, mostly 10–25 cm long, but sometimes much longer, 2–6-noded.	
Everlasting daisies (<i>Chrysocephalum apiculatum</i>),	Variable sometimes bushy perennial herb 7–60 cm high; branches ± matted with woolly hairs (rarely absent), with underlying glandular hairs. Leaves linear-lanceolate to oblanceolate or spatulate, 1–6 cm long, 10–25 mm wide, apex acuminate to rounded and apiculate, margins flat or recurved, indumentum as on branches, sometimes slightly denser on the lower surface. Heads several to numerous in compact clusters, terminal on branches; heads sessile or shortly pedunculate, campanulate to obconical, 5–8 mm long, 7–15 mm diam.; intermediate involucre bracts longest; outer bracts scarious, opaque, golden-yellow or ± tinged-brown (occasionally white when sometimes tinged pink).	
Clustered Everlasting (<i>C. semipapposum</i>)	Variable aromatic perennial herb 15–60 cm high with numerous wiry stems; branches ± woolly and with inconspicuous glandular hairs. Leaves linear, 0.2–5 cm long, 1–2 mm wide, apex acute to apiculate, flat or margins ± recurved, indumentum as on branches, often slightly denser on lower surface. Heads in compact corymbose clusters, or rarely heads solitary, terminal on usually leafy branches, shortly pedunculate, campanulate to obconical, 5–7 mm long, 6–7 mm diam.; involucre bracts 8–10-seriate, innermost usually longest; outer bracts woolly; inner bracts erect, about equal to the florets.	

Genus	Description	Image
Yellow Buttons (<i>Leptorhynchos</i> spp.)	Annual or perennial herbs with glandular and non-glandular short, long or woolly-cobwebby hairs. Leaves basal and cauline, alternate, sessile or sheathing, entire or slightly crenate. Compound heads solitary, terminal on long flowering scapes or in leafy corymbs, campanulate or almost hemispherical; involucre bracts in many series, outer much smaller and grading in size inwards, with herbaceous bases, those of the outer bracts reduced, those of the inner bracts long and usually claw-like, all with scarious laminas; receptacle convex, naked, pitted. Florets are numerous, mostly bisexual, 5-merous, with a few outer florets female, 3- or 4-merous.	 An example of a <i>Leptorhynchos</i> species.



Figure 4. An example of Natural Temperate Grassland (NTG), that presents habitat for KMG and GSM (Photo: DPE, 2023)

KMG is assumed present in the Crookwell, Inland Slopes and Murrumbateman IBRA subregions due to the presence of suitable grassland habitats and multiple records within 5 kilometres of the project footprint and known within the Murrumbateman IBRA subregion portion of the project footprint (10 records in total across the project footprint). During field surveys, four individuals were identified within the Murrumbateman IBRA subregion.

The project would result in the loss of approximately 170.71 ha of potential habitat (including 5.78 ha of prescribed impacts) where the species is considered likely to occur, however as the species occurrence is poorly known this is likely to significantly inflate the potential impact area.

The full methodology parameters that were identified to predict potential KMG habitat using expert advice and survey data can be found in the BDAR (Niche, 2024).

3.5 DISTRIBUTION

Prior to European settlement, KMG was originally distributed from Victoria to Orange (NSW) across the wheat and sheep. Due to intensified agricultural practices like regular livestock grazing and cropping, its habitat has significantly diminished. Presently, it is confined to small pockets of habitat within agricultural areas, such as rural cemeteries, reserves, and railway cuttings with recent studies indicating a continued decline in its population.

KMG distribution in NSW is shown in Figure 5. The location of KMG habitat (species polygons) in the project footprint per the Revised BDAR is provided in Attachment 1.

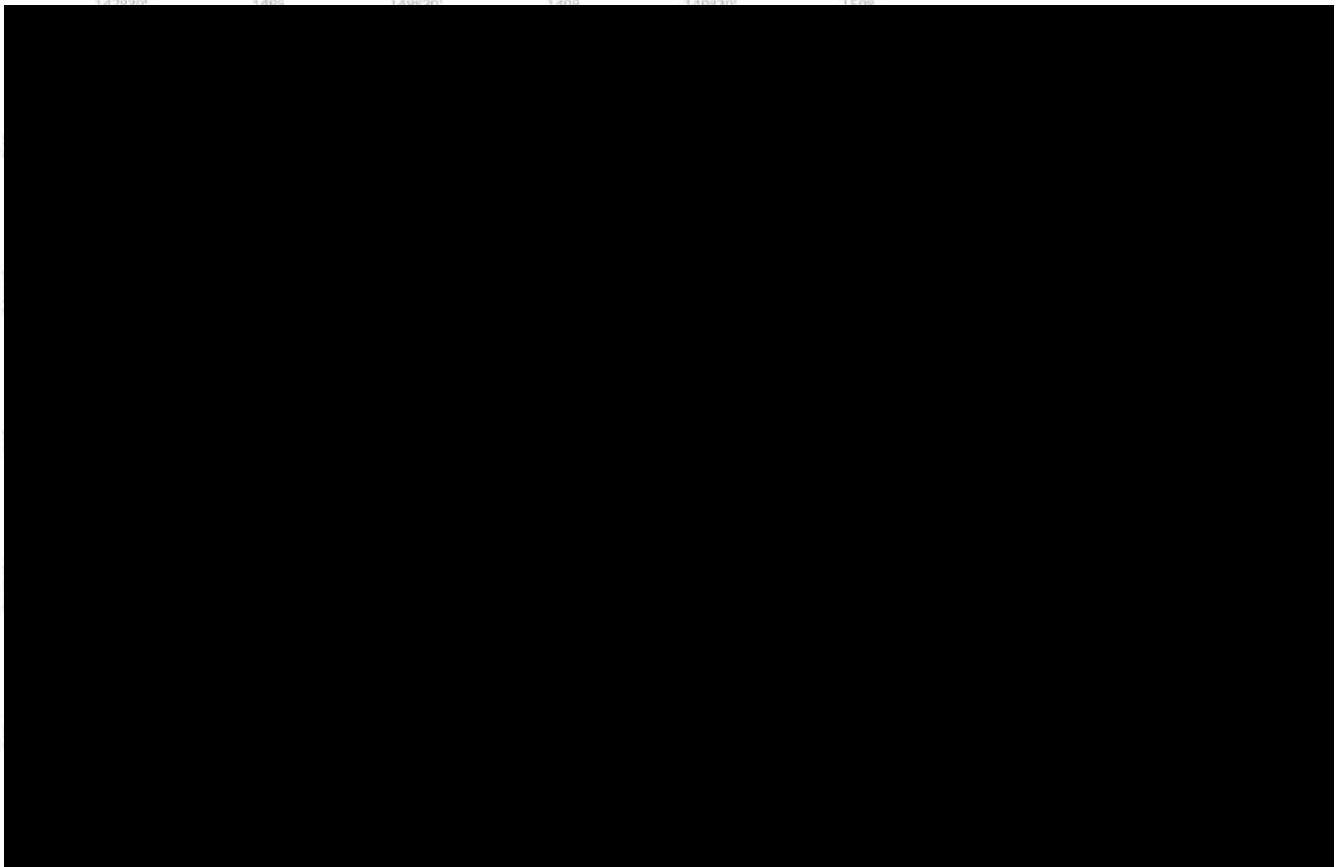


Figure 5. KMG distribution in the project area with bioregions and incidental fauna locations.

4. IMPACT AVOIDANCE AND MINIMISATION

4.1 IMPACT AVOIDANCE

During the development of the Project, design refinement will avoid direct impacts where possible to mapped GSM and KMG habitat areas and avoid habitat fragmentation. Avoidance and mitigation measures will be prioritised including

- threatened species habitat will be given the highest priority in terms of impact minimisation through detailed design with construction methodologies limiting clearing wherever possible and their habitat outside the final disturbance area will be delineated as no-go exclusion zones.
- threatened species and their habitats and constraints mapping will be identified through the GIS and environmental control maps (ECMs) (per Section 3.4.5 of the CEMP). Spatial data including threatened species locations and constraints mapping will be provided to the design and construction teams and considered in detailed design.
- Results of pre-clearing surveys will be used to update and confirm the accuracy of the GIS and ECMs. ECMs will be provided to the construction workforce.
- micro-siting of the transmission line infrastructure and associated construction working areas during the finalisation of detailed design and pre-clearance surveys to avoid impacts, where possible, to known and assumed present GSM habitat and KMG habitat.

4.2 DIRECT IMPACTS

In line with the clearing extents stipulated in Condition B25 of the Infrastructure Approval, the project will directly impact approximately 30.54 ha of foraging and breeding habitat for the GSM (including 3.06 ha of prescribed impacts on non-native habitat) and approximately 170.71 ha of potential habitat for the KMG (including 5.78 ha of prescribed impacts) where the species is considered likely to occur, however as the species occurrence is poorly known this is likely to represent an inflation the potential impact area.

Plant Community Types (PCT) present in the Project footprint that are associated with GSM include PCT 266, 277, 352 and 1330. KMG is associated with PCTs 266, 277, 278, 283 and 1330.

The Project would include the retention of ground-layer vegetation throughout the transmission line easement wherever possible, potentially minimising impacts to the species and allowing for species persistence within areas of potential habitat in the Project footprint.

Clearing limits for GSM and KMG habitat, in accordance with Appendix 2 (Biodiversity) of the Infrastructure Approval are provided in Table 4.

Table 4 Clearing Limits for GSM and KMG Habitat

Scientific Name	Common Name	BC Act status	EPBC Act	SAIL	Area of impact (ha)	Recorded/assumed present
<i>Keyacris scurra</i>	Key's Matchstick Grasshopper	E	-	-	172.40	Recorded
<i>Synemon plana</i>	Golden Sun Moth	V	V	-	28.48	Assumed present

5. MANAGEMENT MEASURES

This Plan takes an adaptive management approach to conserving and rehabilitating GSM and KMG habitat that has been temporarily disturbed during construction, including:

- 1) Confirmation of areas for potential topsoil and vegetative matter salvage for re-use in rehabilitation sites
- 2) Direct seeding for rehabilitation
- 3) Management of weeds in GSM and KMG habitat adjacent to rehabilitation sites within the Project footprint to improve habitat quality
- 4) Monitoring rehabilitation sites for grassland condition and invasive weeds

Due to the expected time periods (potentially years) between the clearing and rehabilitation stage of the Project, it was not considered feasible to salvage and transplant grasslands.

5.1 ADAPTIVE MANAGEMENT

In some instances, corrective actions relating to specific issues may require changes to or additional mitigation measures to those listed within the Plan. Where minor amendments to the Plan are required, the Environmental Representative may approve these amendments in accordance with CoA A13. Amendments to these documents that are of a nature greater than minor may require further government agency consultation and approval by the Secretary.

5.2 GSM AND KMG HABITAT REHABILITATION

5.2.1 REHABILITATION SITES

GSM and KMG habitats that have been temporarily disturbed during construction will be rehabilitated in accordance with UMM B3 and B9. Potential rehabilitation sites i.e., temporarily disturbed areas during construction within GSM and KMG species polygons, are identified in Appendix H of the BMP: Flora and Fauna Monitoring Program. Note that the temporary disturbance areas are based on project design which is still subject to ongoing refinement and therefore the final rehabilitation sites will be confirmed once project design has been finalised.

Rehabilitation methods will be undertaken in consultation with the relevant landowner and agreement of the landowner will be required for identified management actions (e.g. direct seeding actions as per Section 5.2.4) for GSM/KMG rehabilitation sites. Ongoing maintenance and monitoring of rehabilitation sites will be required (refer to Sections 5.3 and 5.4).

Additional factors for consideration for rehabilitation sites are detailed in Table 5. Factors that resulted in successful and unsuccessful rehabilitation efforts for consideration are summarised in Table 6.

Table 5. Factors to be considered for rehabilitation sites.

Selection Factor	Considerations (rehabilitation sites)
Land tenure	- Long-term security of the site - Ability to access for maintenance and monitoring duration with landowner agreement
Threat Management	- Ongoing detrimental disturbance regimes and threat management. - Ability of the landholder to maintain the rehabilitated habitat - Tussock separation maintenance methods (conservation grazing) to be conducted outside the flying/laying season focusing on maintaining intermediate disturbance in years of higher biomass and grazing exclusion in drier times when the climate supports inter tussock space. Burning or slashing methods are not recommended. - Grazing must be closely monitored, and stock removed when overgrazing is impacting grass height/tussock separation. - Stock must be removed from September to January (inclusive) when GSM and KMG are hatching, flying, mating and laying. - Maintenance and monitoring requirements of rehabilitated sites are detailed within Section 5.3 and Section 5.4.
Adverse effects on rehabilitated sites	Negative impacts upon the receiver ecosystem (e.g. spread of novel weeds and pathogens)

Table 6. Factors that resulted in successful and unsuccessful rehabilitation

Unsuccessful rehabilitation	Successful rehabilitation
• High loss of germinated plants within the first year of direct seeding (hot dry summers, frost damage). • Poor direct seeding and topsoil placement technique • Negative impacts of flood, fire, disease and herbivory (native and introduced domestic/feral species, both vertebrate and invertebrate). • Inadequate germination of seeding • Failure to adequately control or manage the existing threats affecting the species or habitat. • Poor rehabilitation site selection (threats present at site). • Poor ex-situ potted plant quality (e.g. pot bound, immature, overly mature). • Absence of ongoing commitment of resources for monitoring, evaluation and follow-up maintenance.	• Preparation of a robust and comprehensive rehabilitation plan. • Commitment and collaboration of a range of expertise contributing to success. • A robust and comprehensive approach to rehabilitation site preparation. • Motivated landholder on board • Removal and ongoing management of threatening processes. • Watering during dry periods over the first two years • Protection from grazing and trampling. • Financial commitment to ongoing maintenance, monitoring and evaluation.

5.2.2 TOPSOIL SALVAGE

The reproduction of many flora species relies on the formation of a bank of seeds in local topsoils (top ~100 mm of the soil profile). This soil seed bank can form an important source of genetic material and diversity for many plant species. Depending on the species and presence of favourable climatic conditions, seed stored within the soil seed bank may germinate sporadically over time with the natural deterioration of seed coats and/or in response to specific germination cues (e.g. soil disturbance, fire-related cues, seasonal temperature fluctuations etc.). As a result, soil seed banks can be a valuable genetic and ecological resource from which a portion of the habitat may be relocated. Soil relocations also provide a potential benefit of coincident translocation of soil microbial communities which can play an important role in the lifecycle and persistence of many plant species.

Topsoil salvage will be undertaken, where possible, in areas mapped as GSM and KMG habitats to retain topsoil and associated seed banks for reuse at a later stage to support direct seeding efforts. During pre-clearing surveys, the Project Ecologist will ground truth areas mapped as GSM and KMG habitats in order to determine the suitability (e.g. absence of weeds) of habitats for topsoil salvage and reuse. Sites where GSM and KMG have been recorded will be prioritised using the following considerations:

- For GSM, grassland habitats, particularly NTG, that exhibit suitable larval food plants such as *Rytidosperma carphoides*, *R. auriculatum*, *R. laeve*, *R. caespitosum*, *R. setaceum*, *R. erianthum*, *R. racemosum*, *Austrostipa bigeniculata*, *A. scabra* and *Bothriochloa macra* will also be prioritised for topsoil salvage. Although GSMs are known to colonise exotic grasslands dominated by Chilean Needle Grass (*Nassella neesiana*), these habitats are not considered suitable for topsoil salvage due to their biosecurity threat
- For KMG, grassland and grassy woodland, particularly NTG, characterized by Kangaroo Grass (*Themeda triandra*) alongside areas with everlasting daisies (*Chrysocephalum apiculatum*), Clustered Everlasting (*C. semipapposum*), yellow buttons of the genus *Leptorhynchos* and species of the genus *Plantago* (natives and introduced) and *Acaena* that provide food will be prioritised for topsoil salvage.

Pre-clearing surveys will also identify potential temporary storage locations for salvaged topsoil if required. Topsoil salvage works will be undertaken with consideration to the Biosecurity Management Plan (Appendix D), the Soil and Water Management Plan and the Waste Management Plan.

Additional considerations for topsoil salvage are provided in Table 7.

Table 7. Topsoil salvage, transportation and storage considerations.

Method	Description
Topsoil and seedbank salvage	• As far as practicable, the size of any plant/machinery used to conduct the topsoil salvage should be minimised • All plant, equipment and materials are to be thoroughly cleaned of excess dirt prior to entering the topsoil salvage area

Method	Description
	- Physical removal of soil matrix with a minimum depth of 100mm of topsoil is to be excavated via manual (e.g. shovels) or mechanical (e.g. excavator) means to retain the seed bank. - Topsoil salvage should aim to take the entire grass root zone as pupae may occupy the lower reaches of the root zone.
Transportation of salvaged topsoil	- Care must be taken during transport to minimise disturbance and impaction of topsoil as far as practicable - Delivery of salvaged topsoil is to be undertaken with vehicles/machinery determined as most appropriate in consultation with the earthworks contractor.
Temporary storage of salvaged topsoil	- Stored topsoil is to be retained for use in direct seeding efforts to provide support for rehabilitation of habitats - Topsoil will be stored in accordance with requirements in the Soil and Water Management Plan - Temporary storage locations of topsoil will be included within Environmental Control Maps (ECMs) - Stored salvaged topsoil should be placed at the rehabilitated areas as soon as practically possible to increase rehabilitation success.

5.2.3 TOPSOIL PLACEMENT

Rehabilitation sites will require topsoil placement prior to direct seeding efforts and will incorporate the use of salvaged topsoil where possible to support direct seeding efforts. Considerations for topsoil placement are provided in Table 8.

Table 8. Topsoil placement considerations for rehabilitation sites.

Method	Description
Equipment, materials and resources	- Confirm sources of equipment, materials and resources required to deliver and install topsoil and associated seed bank - As far as practicable, the size of any plant/machinery used to conduct topsoil installation should be minimised.
Earthworks (soil scalp, landform)	- Final levels of rehabilitation sites will be less than 1:3 slope - Rehabilitation site to be cleared of all construction materials and waste in preparation for receipt of topsoil - Any excavated soils from scalping, where required, are to be removed and retained adjacent to the rehabilitation site if suitable for use in rehabilitation works - Consideration to be given to optimal site design with regard to maintaining topsoil in situ at the rehabilitation site - Consideration to be given to how establishment and maintenance watering will be applied to the site. If a water cart is used, access paths should be designed so that the carts are not required to drive over topsoil.
Site protections (temporary fencing and silt fencing)	- Following soil scalping and topsoil introduction, appropriate soil erosion and slumping control and prevention measures should be installed at the receiver site. Stabilisation works should be conducted in accordance with the Soil and Water Management Subplan - Install temporary fencing and signage around rehabilitation sites where practicable and feasible.
Site Preparation	- Excavated areas intended to receive topsoil should be thoroughly watered and plant establisher with water crystals applied ~2 hrs prior to the direct seeding - Deposited topsoils are to be spread to a depth of ~100 mm across the rehabilitation site - As far as is practical, any machinery used should avoid driving over topsoil areas. Use of machinery should be limited to the installation of topsoil upon the prepared sub-soil surface only. All fine-level spreading of topsoils should be undertaken manually. - If applicable, any remaining soil excavated from the receiver hole, deemed suitable for use rehabilitation works, is to be thinly spread over the surrounding area such that it does not smother any existing native groundcovers in the vicinity.

5.2.4 DIRECT SEEDING

Direct seeding will be used in rehabilitation areas to reinstate native grasslands and associated threatened insect habitats. A summary of the direct seeding considerations is provided in Table 9.

Table 9. Direct seeding considerations

Method	Description
Direct seeding	• Direct seeding involves sowing plant seed either by hand or using machinery • Direct seeding is an alternative revegetation to the installation of nursery-grown tube stock, which can be more cost-effective when high-density revegetation of large areas is required • Salvaged GSM and KMG habitat topsoil and associated seedbank are to be prioritised for use in direct seeding rehabilitation sites where possible • Seeds and supplementary planting should have sufficient genetic variability to facilitate adaptation in a changing climate. • Timeframes for direct seeding and supplementary planting should be discussed with seed/plant providers to ensure successful establishment. • Local / climate-adapted provenance seeds from the following species are to be used for GSM habitat revegetation <i>Rytidosperma carphoides</i>, <i>R. auriculatum</i>, <i>R. laeve</i>, <i>Austrostipa bigeniculata</i> and <i>A. scabra</i>. <i>R. caespitosum</i>, <i>R. setaceum</i>, <i>R. erianthum</i>, <i>R. racemosum</i> and <i>Bothriochloa macra</i> • Local / climate-adapted provenance seeds for KMG habitat include grasses such as Kangaroo grass (<i>T. triandra</i>) and importantly native daisies of the Family Asteraceae (genus <i>Chrysocephalum</i>, <i>Leptorhynchos</i>, etc.) and consideration of subspecies based on the distribution area of these daisies. • If necessary, weeds are to be managed prior to direct seeding. A temporary nurse crop such as <u>sterile</u> ryecorn can be used to stabilise the soil and suppress weeds during establishment if required. • As far as is practical, any machinery used for direct seeding works should avoid driving over rehabilitation sites, particularly when the soil is moist, or tyres leave compressions in the soil. • Soil disturbance has the potential to trigger germination from the soil seed bank. Initial watering of the rehabilitation site may be important for initiating germination. • Following its establishment, the rehabilitation site is to be thoroughly watered. • If direct seeding efforts are insufficient or unsuccessful, consideration should be given to supplementary planting and/or additional applications of direct seeding of provenance native species to establish a native species cover. The requirement for supplementary planting should be assessed in conjunction with monitoring and annual reporting of site works.

5.3 MAINTENANCE REQUIREMENTS

5.3.1 REHABILITATION SITES

Maintenance will be undertaken by AGJV for the duration of construction and if required thereafter, will be undertaken by Transgrid in accordance with an Operational Environmental Management Plan (OEMP) or Rehabilitation Plan for the site.

Maintenance weed control in rehabilitated sites should aim to:

- maintain the surroundings of the rehabilitated sites, where mapped as GSM/KMG habitat and located within the Project footprint, as weed-free
- consolidate and expand native species patches
- prevent/minimise weed seed set.

Maintenance requirements for rehabilitation sites are detailed in Table 10.

Table 10. Maintenance requirements for rehabilitated sites

Method	Description
Water and Weed Maintenance	• Thorough watering should be undertaken two times per week for the first three weeks following installation • Subsequent ongoing water maintenance of rehabilitation sites is to be undertaken as required, dependent upon prevailing climatic conditions and plant growth/health, for 24 months • Watering should be undertaken in a manner that minimises trampling of soils within the rehabilitated sites. Vehicles should be excluded from the rehabilitation sites unless dedicated pathways that exclude topsoil have been created • Weed control and maintenance should commence when required to prevent weed seed set, particularly of priority and environmental weed species

Method	Description
	• Secondary and maintenance control of emerging populations of weed species within the rehabilitated sites is to be undertaken every two months, for 24 months • As far as is practical, the use of herbicide spray applications for maintenance weed control should be avoided to ensure the long-term health of the ecosystem • The frequency of maintenance weed control visits should be increased if the prescribed visitation is insufficient to control weed growth • If direct seeding efforts are insufficient or unsuccessful, consideration should be given to supplementary planting and/or additional applications of direct seeding of provenance native species to establish a native species cover. The requirement for supplementary planting should be assessed in conjunction with monitoring and annual reporting of site works.

5.3.2 GSM AND KMG HABITAT ADJACENT TO REHABILITATION SITES

Management of weeds in GSM and KMG habitats adjacent to rehabilitation sites within the Project footprint will be undertaken to assist in increasing the quality of habitats for threatened insects through weed removal. Weeds are to be managed appropriately in accordance with this plan and Appendix D: Biosecurity Management Plan. Weed maintenance records should be kept of methods, area/numbers and species of weeds treated.

NTGs generally correspond with the best GSM and KMG habitat, therefore chemical weed control in these areas should be undertaken with caution and sparingly, as the effect of herbicides on GSM and KMG is unknown.

Where removal of Chilean Needle Grass (*Nassella neesiana*) is considered necessary, it will be undertaken with consideration to the GSM breeding and flying period (see Section 2) and be detailed within the EWMS.

5.4 MONITORING REQUIREMENTS

Baseline vegetation condition (pre-clearance) for rehabilitation sites i.e., temporarily disturbed areas during construction within GSM and KMG species polygons (refer Appendix H of the BMP: Flora and Fauna Monitoring Program) will be taken from the BDAR and species expert reports. Note that the temporary disturbance areas are based on project design which is still subject to ongoing refinement therefore the final rehabilitation sites will be confirmed once the project design has been finalised.

5.4.1 CONDITION AND WEED MONITORING

Vegetation condition and weed monitoring will be undertaken at rehabilitated sites post-rehabilitation by AGJV for the duration of construction. Rehabilitated sites will be monitored for their condition quarterly following rehabilitation for the duration of construction (where access to the property is available) until vegetation condition scores are within 30% of the baseline levels, considered to be at 100%, i.e., until rehabilitated sites reach 70% condition. Condition monitoring will review:

- Weed presence and coverage
- Vegetation condition score.

Monitoring for threatened insect habitat rehabilitation areas is also summarised in the monitoring program detailed in Section 8.3 of the BMP.

5.4.2 THREATENED INSECT HABITAT REHABILITATION MONITORING REPORT

Monitoring will be summarised within a Threatened Insect Habitat Rehabilitation Monitoring Report which will include recommended management measures if required as detailed in Section 8 of the BMP.

ATTACHMENT 1: GSM AND KMG HABITAT WITHIN PROJECT FOOTPRINT (SPECIES POLYGONS)

APPENDIX H: FLORA AND FAUNA MONITORING PROGRAM

HumeLink East



Flora and Fauna Monitoring Program HLE-AGJ-ENV-ALE-PRD-0000-00007 | Rev 00

I. APPROVALS

	Name	Signature	Date
Author:			13/08/2025
Sponsor:			13/08/2025
Project Director:			13/08/2025

The authorised use of this document shall only be once approved by way of presence of signatories under section above.

II. DOCUMENT CONTROL – REVISION HISTORY

Rev	Date	Pages	Revised by	Description
A	17/03/2025	All		For submission to Transgrid
B	14/04/2025	All		Update to address Transgrid comments
C	02/05/2025	Pg. 19		Update to address ER comments
D	13/06/2025	All		Update to address CPHR comments.
E	22/07/2025	14		Update to address CPHR comments.
F	13/08/2025	Various		Update to address CPHR comments.
00	15/09/2025	Nil		Issued for Use

GENERAL REQUIREMENTS

The Project Director is responsible for the distribution of this Management Plan. The controlled master version of this document is available for distribution as appropriate and maintained on RIB | CX. All circulated hard copies of this document are deemed to be uncontrolled. The implementation of this Management Plan is under the authority of AGJV and the Project Director. All personnel employed on the Project will perform their duties in accordance with the requirements of this Management Plan, supporting management plans, and related procedures.

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1. INTRODUCTION

This Flora and Fauna Monitoring Program (Program) is an appendix to the Biodiversity Management Sub-plan (BMP) which forms part of the Construction Environmental Management Plan (CEMP) for the HumeLink East Project (the Project). Acciona Genus Joint Venture (AG JV) has been contracted to deliver the Project. Refer to the BMP for the glossary, references & compliance against relevant Conditions of Approval (CoA) and Updated Mitigation Measures (UMMs).

1.1 PURPOSE

This Program details the relevant flora and fauna monitoring procedures required to verify the implementation and effectiveness of the commitments made in the BMP, in accordance with UMM B3 and CoA B30.

Any requirements under the EPBS Act applicable to this Program are detailed in Section 3.2 of the BMP.

This Program has been prepared by Principal Ecologist [REDACTED] BSc (Zoology & Entomology), Hons (Zoology), PhD (Ecology) and [REDACTED] BSc (Biology), Grad. Dip. (Bushfire Protection).

1.2 SCOPE

This Program covers all monitoring and reporting requirements required by the Project during the construction phase as detailed in Table 1.

Table 1. Monitoring and reporting requirements addressed in the Program

Monitoring Type	Cross Reference
Partial Clearance	Section 3
Weed, Pathogen and Pest Monitoring	Section 4
Rehabilitation Monitoring	Section 5
Threatened Flora	Section 6
Threatened Frog Monitoring	Section 7
Artificial Hollow Monitoring	Section 8
Glider Pole Monitoring	Section 9
SAIL Mitigation Monitoring	Section 11

Pre-clearing surveys will be undertaken in accordance with Appendix B Vegetation Clearing Procedure. Operational monitoring and reporting are not discussed in this Program.

1.3 INDUCTION AND TRAINING

All Project personnel are to be inducted on the existence of this Program during the Project Induction and in more detail as required in Site Inductions and regular Toolbox Talks. Records of all training, including inductions, will be maintained. Records will include the name and role of the attendee, the date of training/induction, and the name of the course.

1.4 ROLES AND RESPONSIBILITIES

The Project Team's organisational structure and overall roles and responsibilities are outlined in Section 3.5 of the CEMP. Specific responsibilities for the implementation of environmental controls are detailed in Table 31 of the BMP.

The Project Ecologist will be responsible for monitoring and reporting requirements as detailed in this Program.

2. BASELINE DATA

2.1 EXISTING BASELINE DATA

Baseline data relating to threatened ecological communities, threatened flora species and threatened fauna species is captured within the Revised BDAR and is based on field surveys undertaken during the planning approval assessment phase. The Revised BDAR describes various sources of data used to inform field surveys to gather baseline data on the presence of flora and fauna on the Project site. This included mapping (where applicable) of:

- Coastal Wetlands (Resilience and Hazards SEPP)
- Floodplain wetland
- Rivers and Tributaries
- Key Fish Habitat
- Existing BioBanking Sites
- NSW BioNet Vegetation Classification database
- The federal Bureau of Meteorology's Atlas of Groundwater Dependent Ecosystems
- Soil Landscapes
- Available regional vegetation mapping and previous biodiversity studies (refer to References within the Revised BDAR)
- BioNet Atlas of NSW Wildlife
- BioNet Threatened Biodiversity Data Collection
- NSW Department of Primary Industries (DPI) Fisheries Spatial Data Portal
- The federal Department of Environment's Protected Matters Search Tool (PMST)
- Area of Outstanding Biodiversity Value register
- Other local threatened fauna species studies (refer to References within the Revised BDAR).

Based on the information gathered from the above sources, targeted flora and fauna surveys occurred to inform the Environmental Impact Statement (EIS). The results of targeted flora and fauna surveys relevant to the Project are detailed in Section 5 of the BMP. Any additional baseline data obtained through additional surveys, supplementary biodiversity surveys (CoA B28) or results of the BAVR (CoA B29) will be incorporated into updates of this Program, as required.

Baseline data sourced from the EIS and Revised BDAR for the Project will be used for monitoring works as detailed in each section and summarised in Table 13.

2.2 ADDITIONAL BASELINE DATA

Additional baseline data, considered as new baseline data, i.e. not previously included within the Revised BDAR, is required for specific monitoring streams as detailed in each section and summarised in Table 13. Additional baseline data will be collected prior to the relevant specific construction activity commencing and will be factored in updates to this Monitoring Program.

Any unexpected finds will be managed under Appendix A Unexpected Threatened Species Find Protocol.

3. PARTIAL CLEARANCE MONITORING

In line with CoA B30(d)(viii), partial clearing areas will be progressively monitored to confirm the assumptions made in the BDAR regarding partial clearance within the Easement Clearing Zone and whether any changes are required to this plan.

Two key assumptions are to be tested by the partial clearing monitoring:

- Tracking the extent (hectares) of partial and total clearing to with reference to the current final layout plans to demonstrate adherence to the clearing limits.
- Verify the assumptions relating to vegetation impacts and retained vegetation integrity in the partial clearing zone.

3.1 TRACKING OF CLEARING LIMITS

Verification monitoring of clearing limits will be conducted every three months throughout the construction phase. Clearing must be tracked with reference to the most recent Final Layout Plans, as submitted in accordance with Condition C8 to the Department. Within these plans, all areas must be categorised as follows:

- Cleared
 - Total clearance
 - Partial clearance
 - Hazard tree removal only
- Not impacted (forecast)

Any clearing activities outside the areas identified in the most recent final layout plans must be clearly identified and justified, such as changes made in accordance with an approved Consistency Assessment or in response to an incident that has been reported.

All clearing completed during the current three-month reporting period must be verified using georeferenced drone imagery (or equivalent) with <1m spatial resolution.

A spatial polygon file must be produced to delineate both the completed and forecast clearing footprint for the reporting period. This shapefile must be used to quantify the extent of clearing of:

- Native vegetation
- Threatened flora habitats
- Threatened fauna habitats
- Endangered population habitats.

When calculating the extent of clearing, the most current approved datasets must be used and clearly referenced.

The spatial dataset, along with:

- Maps showing all areas cleared within the reporting period, and
- A reconciliation table comparing the clearing footprint to the current approved clearing limits

must be submitted to TransGrid and CHPR as part of the quarterly verification report.

3.2 VEGETATION CONDITION ASSESSMENT

The vegetation condition assessment component of the progressive partial clearing monitoring is intended to verify key Biodiversity Development Assessment Report (BDAR) assumptions, specifically:

- Retention of mid- and understorey vegetation structure
- Retention of vegetation integrity (VI) score as a proxy for condition

Monitoring vegetation condition — a proxy for ecological function — in partially cleared areas will enable detection of changes over time. This information will then be used to inform any changes required to clearing methods to maintain the vegetation condition and meet the BDAR Assumptions.

Assessments will be carried out using vegetation integrity survey plots methods outlined in the Biodiversity Assessment Method (BAM, 2020). Monitoring sites will consist of plots measuring 400 m² (e.g. 20 m × 20 m), with actual plot dimensions adjusted to suit the available area within each partially cleared site.

The target number of plots has been calculated with reference to the total area of clearing within each vegetation class, using the following rules:

- 1 plot per 3 ha by vegetation classes (rounded up)
- No plots for vegetation classes smaller than 0.5 ha

The target number of plots for each vegetation class are then proportionally distributed across the Very High, High, and Moderate vegetation condition classes within each Plant Community Type (PCT).

The target distribution of vegetation plots are summaries in Table 2 Each vegetation plot must be paired to a control plot located within adjoining non-impacted area of the same PCT and condition class. Control plots should be completed assessed as the same time (within days) of the impact plots.

Photographic monitoring points (described in Section 3.4) must be established in PCTs that are less than 0.5 ha and therefore do not have any vegetation plot monitoring.

Table 3 has corresponding TEC's /CEEC's identified for each PCT.

Table 2. Minimum number of plots required per Vegetation Class and Vegetation Zone.

Vegetation Class	PCT ID	Condition	Area (ha)	Plots per Vegetation Class	Plots Per Vegetation Zone
Central Gorge Dry Sclerophyll Forests			0.83	1	1
	870	Very high	0.83		1
Inland Floodplain Swamps			0.01	0	0
	335	Very high	0.01		0
Inland Riverine Forests			0.14	0	0
	5	Low	0.14		0
Montane Bogs and Fens			0.02	0	0
	1256	Low	0.02		0
South East Dry Sclerophyll Forests			14.85	5	5
	1150	High	7.93		2
		Very low	0.05		0
		Low	0.14		0
	1151	Very high	3.17		2
		High	3.43		1
		Very low	0.00		0
		Low	0.14		0
Southern Escarpment Wet Sclerophyll Forests			0.02	0	0
	1107	High	0.02		0
Southern Tableland Dry Sclerophyll Forests			24.72	9	9
	299	Moderate	1.64		1
		Very low	1.17		0
	349	Very high	0.44		0

Vegetation Class	PCT ID	Condition	Area (ha)	Plots per Vegetation Class	Plots Per Vegetation Zone
		Moderate	0.83		1
		Very low	0.05		0
	351	High	0.00		0
		Moderate	1.35		1
		Very low	0.02		0
		Low	0.07		0
	352	Moderate	0.39		0
		Very low	0.03		0
		Low	0.23		0
	727	Very high	0.37		0
		Moderate	0.07		0
		Very low	0.04		0
	1093	Very high	9.84		4
		High	4.00		2
		Moderate	2.71		0
		Very low	0.57		0
		Low	0.90		0
Southern Tableland Grassy Woodlands			30.06	11	11
	731	Very high	1.61		2
		High	1.71		1
		Very low	0.05		0
		Low	0.43		0
			26.26		
	1330	Very high	2.96		3
		High	8.97		4
		Moderate	2.52		1
		Very low	2.73		0
		Low	9.07		0
Southern Tableland Wet Sclerophyll Forests			2.64	1	1
			2.47		
	295	Moderate	2.47		1
	1097	Moderate	0.00		0
		Very low	0.09		0
		Low	0.08		0
Subalpine Woodlands			1.44	1	1
	679	High	0.26		1
		Moderate	0.08		0
		Low	0.03		0
	952	Moderate	0.39		0
		Very low	0.04		0
		Low	0.32		0

Vegetation Class	PCT ID	Condition	Area (ha)	Plots per Vegetation Class	Plots Per Vegetation Zone
	1191	Very low	0.32		0
Upper Riverina Dry Sclerophyll Forests			1.21	1	1
	314	Moderate	0.90		1
		Very low	0.08		0
		Low	0.23		0
Western Slopes Dry Sclerophyll Forests			0.46	0	0
	287	Moderate	0.10		0
		Very low	0.03		0
		Low	0.24		0
	322	High	0.09		0
Western Slopes Grassy Woodlands			36.85	13	13
	266	High	2.54		1
		Moderate	1.07		1
		Very low	0.03		0
		Low	1.83		0
	268	High	0.38		0
		Low	0.11		0
	277	High	1.53		1
		Moderate	1.60		1
		Very low	1.86		0
		Low	1.97		0
	278	High	0.26		0
		Very low	0.11		0
		Low	1.83		0
	280	High	5.18		3
		Moderate	4.50		1
		Very low	0.82		0
		Low	0.13		0
	283	Very high	0.30		0
		High	0.96		1
		Moderate	0.16		0
		Very low	0.14		0
		Low	0.06		0
	301	Very low	0.00		0
	316	Very high	9.29		4
		Very low	0.03		0
		Low	0.15		0
Grand Total			113.26	42	42

Table 3. EEC – Endangered Ecological Community; CEEC – Critically Endangered Ecological Community Partial clearing limits

PCT	BC Act Listed TECs	EPBC Act Listed TECs	SAIL	Project Partial Clearance Limits (ha)		
				ECZ	HTZ	Total
5	No TEC	No TEC	-	0.14	0.00	0.14
266	CEEC ²	CEEC ¹	TRUE	5.47	0.39	5.87
268	CEEC ²	CEEC ¹	TRUE	0.49	0.00	0.49
277	CEEC ²	CEEC ¹	TRUE	6.96	0.50	7.46
278	CEEC ²	CEEC ¹	TRUE	2.20	0.14	2.34
280	CEEC ²	CEEC ¹	TRUE	10.63	0.39	11.02
283	CEEC ²	CEEC ¹	TRUE	1.61	0.01	1.62
287	No TEC	No TEC	-	0.37	0.00	0.37
295	No TEC	No TEC	-	2.47	0.00	2.47
299	No TEC	No TEC	-	2.82	0.00	2.82
301	EEC ⁴	No TEC	TRUE	0.00	0.00	0.00
314	No TEC	No TEC	-	1.21	0.05	1.26
316	No TEC	No TEC	-	9.48	0.85	10.32
322	No TEC	No TEC	-	0.09	0.00	0.09
335	No TEC	No TEC	-	0.01	0.00	0.01
349	No TEC	No TEC	-	1.33	0.02	1.34
351	No TEC	No TEC	-	1.44	0.06	1.50
352	CEEC ²	CEEC ¹	TRUE	0.65	0.00	0.65
679	CEEC ⁵	No TEC	TRUE	0.36	0.00	0.36
727	No TEC	No TEC	-	0.48	0.01	0.49
731	No TEC	No TEC	-	3.62	0.21	3.83
870	No TEC	No TEC	-	0.83	0.00	0.83
952	EEC ³	No TEC	TRUE	0.76	0.00	0.76
1093	No TEC	No TEC	-	17.74	0.55	18.29
1097	EEC ³	No TEC	TRUE	0.17	0.05	0.21
1107	EEC ³	No TEC	TRUE	0.02	0.00	0.02
1150	No TEC	No TEC	-	8.11	0.57	8.68
1151	No TEC	No TEC	-	6.74	0.66	7.40

PCT	BC Act Listed TECs	EPBC Act Listed TECs	SAIL	Project Partial Clearance Limits (ha)		
				ECZ	HTZ	Total
1191	No TEC	No TEC	-	0.32	0.00	0.32
1256	EEC ⁶	No TEC	-	0.02	0.00	0.02
1330	CEEC ²	CEEC ¹	TRUE	26.26	0.72	26.98
Total				120.04	5.41	125.45

1						

The vegetation condition assessment in each plot will consist of:

- Native species richness count for each growth form category (Tree, Shrub, Grass, Forb, Fern, Other)
- Identification of High Threat Exotic species
- Foliage cover estimate for native and exotic species
- Count of native trees per stem size classes
- Native tree regeneration
- Total fallen log length
- Leaf litter cover percentage
- Count and description of habitat features present
- Any fauna observed utilising the habitat features
- Mulch coverage estimate (ECZ only), and
- Average mulch depth estimate (ECZ only).

The recorded data will be entered into the BAM-Calculator to determine a Vegetation Integrity (VI) Score, to quantify the condition of each PCT.

3.3 PHOTOGRAPHIC MONITORING

Photographic monitoring aims to provide a visual reference of each monitoring site over time, and allow observations of disturbance, stress, weed encroachment, pest and pathogens, and any other general observations relevant to the condition of the vegetation to be made.

Photographic monitoring will be completed with each vegetation integrity plot, consisting of a photograph from each end of the centreline transection in accordance with the Biodiversity Assessment Method (BAM, 2020).

At non-vegetation integrity plot sites, including PCTs with <0.5ha of partial clearing, photographic monitoring must be at fixed georeferenced locations and the orientation recorded to allow for repeat monitoring. Photographic monitoring must use consistent photo points - tripod/set height/nominated bearing - to obtain qualitative/visual data to show retention of vegetation condition and height (~200mm) across ECZ/ HTZ.

3.4 MONITORING PROCEDURE

The partial clearance monitoring procedure is detailed in Table 4 below.

Table 4. Partial clearance progressive monitoring procedure.

Monitoring Activity	Tracking of clearing limits	Vegetation Condition Monitoring	Photographic Monitoring
Details of baseline data available	Spatial data sets: - Final layout plans - Vegetation Species Polygons - Threatened Flora species polygons - Threatened Fauna species polygons - Threatened populations species polygons	Paired control sites Spatial data sets: Point location of proposed partial clearing zone (impact) and reference (control) monitoring points	Spatial data sets: - Point location of proposed partial clearing zone (impact) and reference (control) monitoring points - Point location of proposed photographic monitoring points in vegetation zones <0.5ha
Details of baseline data to be obtained and when	The vegetation tracking must be reconciled with reference to the most current final layout plans submitted to the Department. Vegetation and Species Polygons must utilise the most current HumeLink data set approved by CHPR from the Revised BDAR or subsequent Condition 29 Biodiversity Assessment Verification Report.	Relevant baseline data will be obtained from the control sites.	Baseline data will consist of 'baseline' photographs taken prior to the commencement of clearing works. Photographic monitoring locations established in baseline session will be permanent for the duration of the monitoring program. The geolocation and bearing of the initial (baseline) photographs will be recorded, and a physical marker installed, to ensure subsequent photographs remain consistent throughout the construction phase and allow accurate comparisons to be made.
The frequency and timing of monitoring to be undertaken	Within 3 months of clearing in the monitoring area then quarterly for the duration of construction.	Within 3 months of clearing in the monitoring area then six monthly at each monitoring site for the duration of construction.	Within 3 months of clearing in the monitoring area then six monthly at each monitoring site for the duration of construction.
The location of monitoring	Site wide. Drone verification of all areas where clearing occurred with the three-month reporting period.	Point location of proposed partial clearing zone (impact) and reference (control) monitoring points	- Point location of proposed partial clearing zone (impact) and reference (control) monitoring points - Point location of proposed photographic monitoring points in vegetation zones <0.5ha
Performance indicators	Compliance with the Project partial clearance limits will be assessed against the following parameters: Partial clearing works have been conducted in accordance with CoA B25(a).	Overall, vegetation performance will be assessed against the following parameters: - Consistent visual condition of each PCT compared to the baseline monitoring sessions and baseline data. - Consistent VI scores within to control plots (<10% difference).	

Monitoring Activity	Tracking of clearing limits	Vegetation Condition Monitoring	Photographic Monitoring
The reporting of monitoring results and analysis of results against relevant criteria	The extent of impacts and forecast remaining areas to be cleared will for vegetation and habitats compared to the clearing limits approved in Condition B25.	For each paired plot, the following will be reported: • VI Score. • Composition and structure scores for grass and forb growth forms • Leaf litter Additional information to be provided includes: • Vegetation integrity plot data (species list with cover and count scores) • Vegetation plot data as per BAM-C import data template file • BAM Plot Photos	Visual comparisons between the initial photographic monitoring session and all previous photographic monitoring sessions will be made. Visual evidence of erosion, dieback, stress, disturbance, pest and pathogens, and any other general observations relevant to condition of the PCT will be noted. No significant changes in the condition of the PCT over time should be visible. Visual comparisons between photographic monitoring for validation of partial clearing limits will be assessed directly against the approved partial clearing limits for the Project.
Report/Record and Frequency	Partial Clearing Validation Report (PCVR) every three months during construction per Section 3.5.		
Details of the methods that will be used to analyse the monitoring data	Georeferenced drone imagery (or equivalent) with a spatial accuracy <1m must be used to verify the clearing	Comparison of VI Score, composition and structure scores for grass and forb growth forms and leaf litter for each paired plot.	The visual condition of PCTs is to be directly compared to the baseline photographic monitoring session and all previous photographic monitoring session(s).
Trigger point for corrective actions	Exceedance of clearing limits.	Project-related impacts cause of VI decline >10 %, with reference to the paired control plot.	Project-related cause of significant visual degradation of the vegetation condition compared to baseline photographs.
Procedures to identify and implement additional mitigation measures where the results of the monitoring indicate unacceptable project impacts	Forecast exceedance of the clearing limits must be addressed by avoiding impact within the future clearing areas. If this is not possible a request must be made in accordance with B25 to change the clearing limits. The additional areas must be included in the Condition 9 Works as Executed Plans.	Unless otherwise explained by non-Project associated impacts (e.g. extreme climate events, bushfires etc.), corrective actions will be required should the triggers be met. Depending on the likely cause of visible condition decline, the decline in VI or negative changes in other metrics such as dieback, stress or disturbance, the Project Ecologist and Environment and Sustainability Manager will determine the best course of action in consultation with Transgrid. Corrective actions that would be discussed and confirmed between the Transgrid and the Project Ecologist may include: • Identifying the cause of declines in vegetation condition. • A review of the areas identified as ECZ and HTZ. • A review of works occurring within partial clearance zones. • Review of this Monitoring Program and Appendix B: Vegetation Clearing Procedures for any changes required. • Review if further Project training is required and implemented. •	
Adaptive Action/Response		Where the above triggers are met, Transgrid will determine appropriate additional mitigation measures in consultation with CPHR.	

3.5 REPORTING

A Partial Clearing Validation Report (PCVR) will be submitted every three months during construction. The initial report will be provided within 6 weeks of completion of the first three months of construction-phase clearing (i.e. within 4.5 months of commencement of construction-phase clearing). A subsequent report will be provided every three months thereafter during construction.

Monitoring will be conducted within 3 months of clearing to align with Condition B30(d)(viii) and will be submitted within 3 months of conducting the monitoring.

The report will confirm partial clearance has been undertaken in accordance with procedures identified in Appendix B: Vegetation Clearing Procedure. The report will also provide the results of any partial clearance monitoring undertaken during the reporting period in accordance with Table 4 to confirm the assumptions made in the BDAR regarding partial clearance within the ECZ and HTZ.

The PCVR will report on all PCTs in which partial clearance works or monitoring have been undertaken during the reporting period. Each report will assess any changes to vegetation condition observed during monitoring, and determine any changes subsequently required to the BMP, this Monitoring Program, or Appendix B: Vegetation Clearing Procedures.

The following information is to be collected and compiled within each report:

Part A: Partial Clearing Verification:

- Table of the HumeLink East construction clearing limits with comparison to the extent of clearing completed and forecast for each PCT and threatened species.
-

Part B: Partial Clearing Monitoring:

- Description of areas subject to partial clearance to date, including area (m²) of each PCT partially cleared, and
- The name of contributors to the report and the BAM Accredited Assessor responsible for the results
- VI scores for each paired plot by applying section 4.3.3 of the BAM for assessing vegetation integrity (VI plot survey) including provision of field data sheets
- Date
- Weather conditions
- Photographic monitoring images compared with previous and baseline images
- VI scores for each PCT
- Weed prevalence in each PCT
- Mulch coverage and depth in each PCT
- Habitat condition in each PCT
- Any other disturbance observed within partial clearance monitoring areas
- Assessment against the performance indicators in Table 4
- Recommendations for any additional actions required

Reports will be prepared by the Project Ecologist and Environment and Sustainability Manager and will be provided to Transgrid within 6 weeks of the end of each reporting period. All Project reporting requirements and responsibilities are documented in Section 3.9.6 of the CEMP.

4. WEED, PATHOGEN AND PEST MONITORING

The aim of weed, pathogen and pest monitoring is to limit the detection of new weeds, pests and pathogens and reduce the spread of known weeds, pests and pathogens in the Project footprint.

Annual weed, pathogen and pest monitoring surveys will be undertaken by the Project Ecologist by NSW property boundary within the Project footprint. Surveys will be undertaken using parallel field traverses, with a presence/ absence record of weeds, pathogens and pests observed made for each property.

Baseline data will be obtained prior to commencement of vegetation clearing as part of pre-clearing surveys. Pre-clearing surveys will involve parallel field traverses within each pre-clearance area. The width of parallel traverses will depend on factors affecting line of sight, including vegetation formation, density and terrain. The spacing of field traverses will be determined at the time of survey by the attending ecologist, and will be appropriate to local conditions. Generally, the recommended spacing of parallel field traverses is 70 m wide or less. The distance between parallel field traverses will be recorded in the pre-clearing report.

Table 5 details the monitoring procedure.

Table 5. Monitoring procedure for weed, pathogen and pest

Monitoring Activity	Description
Details of baseline data available	Weeds and pests were identified in the Revised BDAR for the HLE Project footprint as detailed in Appendix D. No evidence of pathogens such as Root Rot (<i>Phytophthora cinnamomi</i>), Myrtle Rust (<i>Austropuccinia psidii</i>) and Chytrid Fungus (<i>Batrachochytrium dendrobatidis</i>) was recorded within the Project footprint.
Details of baseline data to be obtained and when	Baseline data must be obtained prior to commencement of vegetation clearing as part of pre-clearing surveys. The methods for collecting baseline data for weed, pest and pathogens present within the Project are described in Appendix D Biosecurity Management Plan. The full pre-clearing procedure for the Project is described in Appendix B Vegetation Clearing Procedure.
The frequency and timing of monitoring to be undertaken	Annually during construction within the Project area by property.
The location of monitoring	Monitoring of weed, pest and pathogen species will be undertaken in each NSW property area within the Project footprint.
Performance indicator	Per the Trigger Action Response Plan (TARP) provided in Appendix D Biosecurity Management Plan. - Prevent establishment of priority and environmental weed species in threatened insect rehabilitation areas (refer to Section 5) - Prevent establishment and spread of pathogens such as Root Rot (<i>Phytophthora spp.</i>), Myrtle Rust (<i>Austropuccinia psidii</i>) and Chytrid Fungus (<i>Batrachochytrium dendrobatidis</i>) within the Project footprint - Prevent establishment and spread of pests such as fire ants and Varroa mites (<i>Varroa jacobsoni</i> and <i>V. destructor</i>) within the Project footprint. - Prevent biosecurity events and prohibited matter events within the Project footprint - Prevent the spread of weed species within the Project area and in the surrounding habitat as a result of the works.
The reporting of monitoring results and analysis of results against relevant criteria	Any incidental records of pathogens and pests (alert species) will be recorded through monitoring surveys. A comparative analysis against baseline weed monitoring data is to be undertaken with discussion on the efficacy of weed and pathogen control measures implemented. An assessment against the performance indicators will be included. Results of data analysis are to be included in a Weed, Pathogen and Pest Monitoring Report following each monitoring event.
Details of the methods that will be used to analyse the monitoring data	Data from each annual monitoring event will be compared against baseline levels.

Monitoring Activity	Description
Report/Record and Frequency	Pre-clearing Survey Reports detailing baseline monitoring submitted progressively prior to clearing works commencing per Section 4.1. Weed, Pathogen and Pest Monitoring Report submitted annually within three months of monitoring works completion per Section 4.1.
Trigger point for corrective actions	Detection of new weeds, pests and pathogens in the Project footprint Spread of known weeds, pests and pathogens within and beyond the Project footprint
Procedures to identify and implement additional mitigation measures where the results of the monitoring indicate unacceptable project impacts	Unless otherwise explained by non-Project associated impacts (e.g. extreme climate events, bushfires etc.), corrective actions will be required should the triggers be met. Depending on the cause, the Project Ecologist will determine the best course of action in consultation with Transgrid. Corrective actions that would be discussed and confirmed between the Transgrid and the Project Ecologist may include: • Stop work immediately if construction activities occur in new pathogen detection areas. • Project ecologist to assess the pathogen detection area, seek confirmation of pathogen and assign risk levels to impacted and surrounding areas per Appendix D. • Implement weed treatment for any weeds established as a result of the Project within the Project area and surrounding habitat. • Reiterate hygiene controls in prestart and toolbox talks. • Revise Appendix D to include additional measures and controls as required. If a new declared species is identified, the extent of the infestation will be determined immediately and appropriate controls put in place as soon as practicable. The potential sources will be investigated and if possible, mitigation measures to avoid further infestations will be put in place. If required, quarantine measures will be put in place to stop the spread of the infestation. For notifiable weeds, pests or diseases, AG JV Environment Manager to notify Transgrid and report the infestation to the relevant local control authority. For biosecurity events and or prohibited matter events, if identified during construction delivery of the Project, AG JV Environmental Manager to notify Transgrid and Department of Primary Industries (if AGJV is the occupier of the Project site at the time). Determine if an incident or non-compliance has occurred in accordance with Section 3.8 and Section 3.9 of the CEMP
Response	Control and eradication of new weeds, pests and pathogens in the Project footprint and reduction in spread of known weeds, pests and pathogens in the Project footprint to baseline conditions.

4.1 REPORTING

4.1.1 PRE-CLEARING REPORTS

Pre-clearing Reports will be submitted progressively and prior to the relevant clearing works commencing. The following information relevant to weeds, pathogens and pests is to be collected and compiled within the Pre-clearing Reports:

- The name of the observer
- Date
- Weather conditions
- Identification of priority weeds and their locations
- Incidental records of alert pests and pathogens
- Maps of priority weed presence/absence by property

4.1.2 WEED, PATHOGEN AND PEST MONITORING REPORT

A Weed, Pathogen and Pest Monitoring Report will be submitted within three months of monitoring completion. The following information is to be collected and compiled within the Weed Monitoring Report:

- The name of the observer
- Date

- Weather conditions
- Monitoring sites
- Identification of priority weeds and their locations
- Incidental records of alert pests and pathogens
- Maps of priority weeds spatial distribution
- Comparative analysis against baseline weed monitoring data
- Efficacy of weed and pathogen control measures
- Assessment against the performance indicators in Table 5.
- Recommendations for any actions required

Reports will be prepared by the Project Ecologist and provided to Transgrid. Reports may be provided to other agencies upon request. All Project reporting requirements and responsibilities are documented in Section 3.9.6 of the CEMP.

5. REHABILITATION MONITORING

The aim of rehabilitation monitoring is to ensure that all temporarily disturbed areas during construction have been appropriately rehabilitated to their existing baseline condition. The rehabilitation monitoring procedure for rehabilitation sites where threatened insect habitat is present (i.e., temporarily disturbed areas during construction within Golden Sun Month (GSM) and Key's Matchstick Grasshopper (KMG) species polygons) and all other rehabilitation sites is described in Table 6.

Table 6. Monitoring procedure for rehabilitation of temporary disturbance areas

Monitoring Activity	Threatened insect habitat areas	Other areas
Details of baseline data available	Baseline vegetation condition for all rehabilitation sites will be derived from data present within the Revised BDAR (Niche, 2024). The Revised BDAR details the vegetation integrity scores for each vegetation zone. Surrogate plot data collected for the Revised BDAR (Niche) from relevant vegetation zones will be used.	N/A
Details of baseline data to be obtained and when	Where data deficiency is identified, relevant baseline data must be obtained prior to commencement of clearing the area. Baseline data will be obtained from the initial vegetation condition assessment undertaken within each vegetation zone. Each plot will be 1,000m ² , with data collected in accordance with the BAM (2020).	Pre-construction property dilapidation reports.
The frequency and timing of monitoring to be undertaken	12 months following rehabilitation, a vegetation condition assessment will be undertaken within each vegetation zone. Each plot will be 1,000m ² , with data collected in accordance with the BAM (2020).	Within three months following rehabilitation completion, photo monitoring will be conducted to establish the monitoring location and confirm rehabilitation has been completed satisfactorily.
The location of monitoring	As temporary disturbance areas are based on the Project's detailed design, which is still subject to ongoing refinement, the final rehabilitation sites will be confirmed once the Project design has been finalised. This Program will be updated once monitoring sites are confirmed. Habitat areas within the total clearance zones (including both permanent and temporary clearance areas) are shown in Appendix a: Threatened Insect Rehabilitation Sites.	All temporary disturbance sites.
Performance indicator	Vegetation condition scores are within 30% of their associated baseline levels (unless where non-project factors are impacting rehabilitation, such as extreme climate events, bushfires, droughts, heatwaves or landowner activities)	Sites stabilised in accordance with the Blue Book, SWMP and the requirements of CoA B62 and B63 (ie safe, stable and non-polluting).
The reporting of monitoring results and analysis of results against relevant criteria	A comparative analysis against baseline vegetation condition and weed monitoring data is to be undertaken with discussion on the efficacy of rehabilitation measures implemented. Any disturbance observed within rehabilitation areas is to be detailed. An assessment against the performance indicators will be included. Results of data analysis are to be included in a Rehabilitation Monitoring Report following each monitoring event.	Results will be assessed against performance indicators and pre-construction condition.

Monitoring Activity	Threatened insect habitat areas	Other areas
Details of the methods that will be used to analyse the monitoring data	Data from each monitoring session will be compared against baseline levels. Conclusions should be drawn for each rehabilitation site.	Results from monitoring inspections will be compared to pre-construction dilapidation reports and in consideration of any agreements made with landowners.
Report/Record and Frequency	Rehabilitation Baseline Monitoring Report submitted within three months of baseline monitoring works completion per Section 5.1. Rehabilitation Monitoring Report submitted quarterly within three months of completion of monitoring per Section 5.1.	Weekly inspection records and Soil Conservationist inspection reports.
Trigger point for corrective actions	Performance indicators not met.	
Procedures to identify and implement additional mitigation measures where the results of the monitoring indicate unacceptable project impacts	Unless otherwise explained by non-Project associated impacts (e.g. extreme climate events, bushfires, droughts, heatwaves etc.), corrective actions will be required should the triggers be met. Depending on the cause, the Project Ecologist will determine the best course of action in consultation with Transgrid. Corrective actions may include: • Project Ecologist to identify potential cause of rehabilitation failure. • Maintenance measures to be reviewed. • Review if additional seeding required • Implement weed control methods to prevent weed seed set and remove plant species. • Increase frequency of maintenance weed control visits. • Review if further Project training is required and implement if needed. • Review construction methodology to identify management measures to reduce recurrence of any disturbance events	Unless otherwise explained by non-Project associated impacts (e.g. extreme climate events, bushfires, droughts, heatwaves etc.), corrective actions will be required should the triggers be met. Actions will be developed in accordance with Appendix D of the SWMP and the Blue Book and may include: • Updates to ESCPs and implementation of additional ERS&D controls • Weed management • Additional temporary cover and/or seeding
Response	Undertake further agreed rehabilitation actions until performance indicators achieved.	

5.1 REPORTING

5.1.1 REHABILITATION BASELINE MONITORING REPORT

A Rehabilitation Baseline Monitoring Report will be submitted within three months of baseline monitoring works completion. The following information is to be collected and compiled within the report:

- The name of the observer
- Date
- Weather conditions
- Monitoring sites
- VI scores for each vegetation zone within rehabilitation areas based on the Revised BDAR or additional baseline data collected
- Weed prevalence within rehabilitation areas based on the vegetation zones in the Revised BDAR or additional baseline data collected
- Maps of proposed rehabilitation areas
- Photographs of rehabilitation areas
- Any existing disturbance observed within rehabilitation areas

5.1.2 REHABILITATION MONITORING REPORT

A Rehabilitation Monitoring Report will be submitted quarterly within three months of monitoring works completion. The following information is to be collected and compiled within the report:

- The name of the observer
- Date
- Weather conditions
- Monitoring sites
- VI scores for each rehabilitation area
- Weed prevalence in each rehabilitation area
- Maps of rehabilitation area spatial distribution
- Comparative analysis against baseline monitoring data
- Photographic comparison with baseline and previous monitoring images
- Efficacy of rehabilitation measures
- Any disturbance observed within rehabilitation areas
- Assessment against the performance indicators in Table 6.
- Recommendations for any corrective actions required

Reports will be prepared by the Project Ecologist and provided to Transgrid. Reports may be provided to other agencies upon request. All Project reporting requirements and responsibilities are documented in Section 3.9.6 of the CEMP.

6. THREATENED FLORA MONITORING

The aim for monitoring recorded threatened flora species (Hoary Sunray and Yass Daisy) locations outside of the Project impact areas is to identify whether any direct or indirect impacts have occurred as a result of the Project.

Monitoring will consist of:

- Surveying all patches of recorded threatened flora species within areas of predicted indirect impacts and in locations within 50m of the Project impact areas (or final clearing footprint), where achievable within the 200m corridor – for patch extent and health (the 'experimental' sites), and
- Establishment of a control site in retained patches >50m from the final clearing footprint.

Relevant results from any nearby weed monitoring (Section 4) are to be incorporated into the monitoring report to support general habitat monitoring for this species. Table 7 details the monitoring procedure.

Table 7. Monitoring procedure for recorded threatened flora species (Hoary Sunray and Yass Daisy)

Monitoring Activity	Description
Details of baseline data available	Recorded locations of threatened flora species (Hoary Sunray and Yass Daisy) are detailed within the Revised BDAR (Niche, 2024).
Details of baseline data to be obtained and when	Baseline data must be obtained prior to commencement of vegetation clearing. Baseline data will be undertaken for all recorded locations of threatened flora species which are within 50m of Project impact areas (or final clearing footprint), where achievable within the 200m corridor, and at one control site >50m from the final clearing footprint for each species. The control sites are not based on size (e.g. 1,000m ² plot) but rather on 'patch' given this species may be scattered in the landscape. The patch should contain a minimum of five individuals. Baseline data will consist of spatial distribution and extent of known patches (recording on a GPS), as well as data on size, health status, evidence of disturbance and weed encroachment.
The frequency and timing of monitoring to be undertaken	Bi-annually during construction (spring and autumn), with at least one sampling session undertaken during the flowering period for the species.
The location of monitoring	Monitoring will be conducted in all patches of recorded threatened flora species within areas of predicted indirect impacts and in locations within 50m of the Project impact areas, as well as the established control site. Monitoring locations will be confirmed during pre-clearance survey. As the Project disturbance areas are based on the Project detailed design, which is still subject to ongoing refinement, the final monitoring sites will be confirmed once the Project design has been finalised. Habitat areas within the Project clearing limits with a 50 m buffer are shown in Appendix C: Threatened Flora Habitat locations.
Performance indicator	Patch extent and health is maintained at baseline levels.
The reporting of monitoring results and analysis of results against relevant criteria	All patches recorded in each monitoring round are to be compared against baseline data. Relevant information should be taken on patches that are observed to be in declining health or are deceased, including possible reasons for the observations. Evidence of disturbance and weed encroachment should be noted, as well as any recruitment. The patches must not decline as a result of Project related impacts (direct, indirect and uncertain). Changes in patch metrics are to be compared to the control site to assess any impacts to the species that may be occurring at a landscape scale (e.g. drought, flood, heatwave or fire) and therefore not a result of the Project. Results of data analysis are to be included in a Threatened Flora Monitoring Report prepared following each monitoring event.
Details of the methods that will be used to analyse the monitoring data	Data from each monitoring session (patch extent, health status, recruitment, etc.) will be compared against baseline levels. Conclusions should be drawn at the individual level as well as between the experimental and control sites.
Report/Record and Frequency	Threatened Flora Baseline Monitoring Report submitted within three months of baseline monitoring works completion per Section 6.1

Monitoring Activity	Description
	Threatened Flora Monitoring Report submitted bi-annually within three months of monitoring works completion per Section 6.1.
Trigger point for corrective actions	Any project-related impact (direct, indirect and uncertain) causing a retained patch to decline from baseline levels.
Procedures to identify and implement additional mitigation measures where the results of the monitoring indicate unacceptable project impacts	Unless otherwise explained by non-Project associated impacts (e.g. extreme climate events, bushfires etc.), corrective actions will be required should the patches within the 50m impact area to decline. Depending on the cause of the decline, the Project Ecologist will determine the best course of action in consultation with Transgrid. Corrective actions may include: • Re-sampling • Control of weeds, pathogens and pests • Review of construction methodology to determine an approach that will avoid or minimise future impacts to the relevant threatened species. • Additional project staff training.
Response	No further decrease (project-related) in the known patches extent and health measured 12 months after corrective actions initiated.

6.1 REPORTING

6.1.1 THREATENED FLORA BASELINE MONITORING REPORT

A Threatened Flora Baseline Monitoring Report will be submitted within three months of baseline monitoring works completion. The following information is to be collected and compiled within the Threatened Flora Baseline Monitoring Report:

- The name of the observer
- Date
- Weather conditions
- Monitoring sites
- Patch extent and health
- Maps of patch extent spatial distribution
- Any disturbance observed within patches, including grazing, disease, weed encroachment and other disturbances.

6.1.2 THREATENED FLORA MONITORING REPORT

A Threatened Flora Monitoring Report will be submitted bi-annually within three months of monitoring works completion. The following information is to be collected and compiled within the report:

- The name of the observer
- Date
- Weather conditions
- Monitoring sites
- Patch extent and health
- Maps of patch extent spatial distribution
- Comparative analysis against baseline monitoring data
- Efficacy of specific pre-clearing and clearing requirements implemented per Appendix B Vegetation Clearing Procedure
- Any disturbance observed within rehabilitation areas
- Assessment against the performance indicators in Table 7
- Recommendations for any corrective actions required

Reports will be prepared by the Project Ecologist and provided to Transgrid. Reports may be provided to other agencies upon request. All Project reporting requirements and responsibilities are documented in Section 3.9.6 of the CEMP.

7. THREATENED FROG MONITORING

Per UMM B8, site-specific monitoring surveys for *Crinia sloanei* (Sloane's Froglet), *Litoria booroolongensis* (Booroolong Frog), *Litoria castanea* (Yellow-spotted Tree Frog) and *Mixophyes balbus* (Stuttering Frog) will be undertaken at proposed creek crossing sites within and adjacent to the species habitat as well as downstream receiving environments that may be subject to potential indirect impacts.

Crinia sloanei (Sloane's Froglet), *Litoria booroolongensis* (Booroolong Frog), *Litoria castanea* (Yellow-spotted Tree Frog) and *Mixophyes balbus* (Stuttering Frog) were not recorded in the Project footprint but have been assumed present at a total of nine (9) sites within or adjoining the Project, detailed in Table 8.

Table 8. Threatened frog monitoring sites.

Frog Monitoring Site	Frog Species Assumed Present	Cross Reference
FM1	<i>Crinia sloanei</i> (Sloane's Froglet)	Appendix D Figure 02
FM2	<i>Litoria booroolongensis</i> (Booroolong Frog)	Appendix D Figure 03
FM3	<i>Litoria booroolongensis</i> (Booroolong Frog)	Appendix D Figure 04
FM4	<i>Crinia sloanei</i> (Sloane's Froglet)	Appendix D Figure 05
FM5	<i>Litoria castanea</i> (Yellow-spotted Tree Frog)	Appendix D Figure 06
FM6	<i>Litoria booroolongensis</i> (Booroolong Frog)	Appendix D Figure 07
FM7	<i>Litoria castanea</i> (Yellow-spotted Tree Frog)	Appendix D Figure 08
FM8	<i>Mixophyes balbus</i> (Stuttering Frog)	Appendix D Figure 09
FM9	<i>Mixophyes balbus</i> (Stuttering Frog)	Appendix D Figure 10

Where a species is later confirmed absent through targeted surveys (subject to agreement by CPHR), monitoring during construction is not required.

Threatened frog monitoring will consist of both:

- Habitat monitoring
- Presence/absence monitoring

7.1 HABITAT MONITORING

Commonwealth conservation advice for *Crinia sloanei*, *Litoria booroolongensis*, *Litoria castanea* and *Mixophyes balbus* identifies habitat loss and degradation, climate change and diseases such as chytrid fungus as leading threats to their persistence. Changes in hydrology, altered water chemistry, and increases in soil and water nutrient levels are likely to negatively impact these species. In addition, weed incursion has been highlighted as rendering habitats unsuitable.

The Project has potential to cause uncertain indirect impacts which are likely to be habitat-related and therefore, the aim of monitoring changes in the condition of adjacent suitable habitats for these threatened frogs, is to identify whether any uncertain indirect impacts have occurred as a result of the Project.

Monitoring important habitat metrics for the target species, such as water pH and vegetation condition, provides a rapid, robust, and repeatable experimental design that readily shows any Project-related impacts when coupled with a control site. Habitat-based monitoring also provides spatially specific insights, which are important when the aim is to discern potential Project-related impacts to a species that occurs near the disturbance area.

Relevant results from any nearby weed surveys undertaken during pre-clearing surveys (see Section 4) may be incorporated into the monitoring report to support habitat monitoring for these species.

7.2 PRESENCE/ABSENCE MONITORING

The survey methodology described in the NSW Survey Guide for Threatened Frogs (DPIE, 2020) will be employed to obtain baseline and construction phase monitoring data. Surveys are to be undertaken

by the Project Ecologist. A summary of the survey effort and methods for threatened frogs is provided in Table 9.

Table 9. Survey effort and method for *Crinia sloanei*, *Litoria booroolongensis*, *Litoria castanea* and *Mixophyes balbus* (DPIE, 2020).

Site	500m transect of suitable breeding habitat		
Survey method	Survey period	Total effort for a 500m transect	Number of repeat surveys
Sloane's froglet (<i>Crinia sloanei</i>)			
Aural-visual surveys	July – Aug	480 mins	4
Acoustic recorder	July – Aug after flooding rains ¹	154 recorder days	1 x 14 days
Booroolong frog (<i>Litoria booroolongensis</i>)			
Aural-visual surveys	Oct – Dec	480 mins	4
Yellow-spotted tree frog (<i>Litoria castanea</i>)			
Aural-visual surveys	Nov – Dec	120 mins	4
Acoustic recorder	Nov – Dec	154 recorder days	1 x 14 days
Tadpole search	Nov – Dec.	10 mins/50 m ² of surface area	Up to 2
Stuttering Frog (<i>Mixophyes balbus</i>)			
Aural-visual surveys	Sept – March	480 mins	4
Acoustic recorder	Sept – March	154 recorder days	1 x 14 days

¹ Flooding rains are defined as greater than 50mm in 24 hours as per the NSW Survey Guide for Threatened Frogs (DPIE, 2020).

In line with the NSW Survey Guide for Threatened Frogs (DPIE, 2020), monitoring will consist of aural-visual surveys along 2 x 250m transects running in specific habitats as detailed below:

- Sloane's froglet - Running around potential breeding habitat
- Booroolong frog - Running along the edge of suitable stream breeding habitat
- Yellow-spotted tree frog – Completed along the edges of suitable breeding habitat or, if feasible, through shallow wetlands
- Stuttering Frog – completed along suitable breeding habitat, along identified streams with permanent pools

Where there is insufficient habitat to accommodate a 250m transect, a pro-rata effort is to be applied with all available habitats being searched. One survey night will cover a minimum 120-minute total period, to be repeated a minimum of four times. If survey efforts are unsuccessful after two nights of survey, the Project Ecologist may postpone the survey for a period of two weeks before conducting the last two nights of the survey. Methodology for aural-visual surveys must follow section 2.9.1 of the NSW Survey Guide for Threatened Frogs. For *Litoria booroolongensis*, the species is similar in appearance to stony creek frogs (*Litoria lesueurii/wilcoxii*) and distinguishing between them generally requires physical examination. For *Litoria castanea*, confirmation of the species' presence would need to be supported by photographic evidence or call recordings, given it is potentially extinct.

Table 10 details the overall monitoring procedure.

Table 10. Monitoring procedure for *Crinia sloanei*, *Litoria booroolongensis*, *Litoria castanea* and *Mixophyes balbus* habitats.

Monitoring Activity	Description
Details of baseline data available	Water quality monitoring (WQM) was undertaken as part of the EIS and can be used as baseline data if available for each monitoring site. WQM for threatened frogs must include pH. Proposed creek crossing sites within and adjacent to threatened frog species habitat within 250 m downstream of the Project footprint are identified in Figure 13-4 of the Revised BDAR (Niche, 2024). Threatened frogs have been assumed present at nine (9) sites within or adjoining the Project as detailed above.
Details of baseline data to be obtained and when	Where data deficiency is identified, relevant baseline data must be obtained prior to commencement of works at each proposed waterbody impact site. Baseline WQM data and rapid plot (minimum 1 sample per site) is to be collected at each creek crossing location for the associated control site, experimental site and downstream site. Additional baseline WQM undertaken must include pH. One (1) rapid plot (1000m² full floristics plot) is to be established in suitable habitat between the final proposed creek crossing impact footprint within and adjacent to the species habitat (experimental site), within 100m upstream from the construction boundary (control site) and within 250m downstream of the construction boundary (downstream receiving environments).
The frequency and timing of monitoring to be undertaken	Bi-annually during construction (July – Aug and Nov – Dec).
The location of monitoring	See Figure 13-4 of the Revised BDAR (Niche, 2024). Construction monitoring sites will be located at proposed creek crossing sites within and adjacent to threatened frog species habitat within 250 m downstream of the Project footprint subject to landowner agreement. Monitoring sites at each proposed creek crossing site will include three (3) permanent WQM sites and three (3) permanent rapid plots. A permanent WQM site and permanent rapid plot will be located: • Within proximity to the proposed waterbody impact footprint in suitable habitat within and adjacent to the species-specific habitat (the 'experimental' site) • Within 100m upstream of the construction boundary (the 'control' site) • Within 250m downstream of the construction boundary (the 'downstream' site).
Performance indicator	• Weed cover and water quality • Presence/absence
The reporting of monitoring results and analysis of results against relevant criteria	Demonstrate that the condition of the experimental water sampling site has not reduced considerably (i.e. Project-related increase of weed cover >20% or pH $\pm$ 2) compared to its condition in the baseline monitoring. Compare any changes in water quality at the experimental and downstream sites with the control site to determine any Project-related impacts. Species assemblage and cover metrics of the rapid plot are to be compared against baseline levels and between the sites. No new priority weed species are to be detected and cover of existing weeds must not increase by more than 20%. Assess whether any decline in habitat condition at the experimental and downstream sites is a result of Project-related impacts and whether the habitat is still likely to support the target species. Presence/absence of species compared to baseline data results. Results of data analysis are to be included in a Threatened Frog Monitoring Report prepared following each monitoring event.
Report/Record and Frequency	A Threatened Frog Baseline Monitoring Report will be submitted within three months of baseline monitoring works completion per Section 7.3. A Threatened Frog Monitoring Report will be submitted bi-annually within three months of monitoring works completion per Section 7.3.
Trigger point for corrective actions	Project-related increase of weed cover >20%, pH $\pm$ 2 of baseline and outside of the known tolerance for a given species.
Procedures to identify and implement additional mitigation measures where the results of the monitoring indicate unacceptable Project impacts	Unless otherwise explained by non-Project associated impacts (e.g. extreme climate events, bushfires etc.), corrective actions will be required should the condition of the habitat at the experimental site decline such that it is unlikely to support the target species. Depending on the cause of the decline, the Project Ecologist will determine the best course of action in consultation with Transgrid.

Monitoring Activity	Description
	Corrective actions that would be discussed and confirmed between the Transgrid and the Project Ecologist may include: • Increasing the survey effort • Increasing the number of sites for pH testing • Re-assessing construction methodology and erosion and sediment control measures • Surveying and controlling invasive pests • Weed control • Additional Project staff training
Response	Achieve weed coverage <20% of baseline levels and pH $\pm$ 2 of baseline or within the known tolerance for a given species (unless driven by non-Project factors).

7.3 REPORTING

7.3.1 THREATENED FROG BASELINE MONITORING REPORT

A Threatened Frog Baseline Monitoring Report will be submitted within three months of baseline monitoring works completion. The following information is to be collected and compiled within the report:

- The name of the observer
- Date
- Weather conditions
- Monitoring sites
- Water quality monitoring results (EIS or additional baseline)
- Rapid plot results
- Presence/absence baseline data
- Photographic baseline monitoring images
- Maps of threatened frog habitat monitoring sites
- Any disturbance observed within monitoring sites

7.3.2 THREATENED FROG MONITORING REPORT

A Threatened Frog Monitoring Report will be submitted bi-annually within three months of monitoring works completion. The following information is to be collected and compiled within the report:

- The name of the observer
- Date
- Weather conditions
- Monitoring sites
- Maps of threatened frog habitat monitoring sites
- Comparative analysis against baseline and subsequent monitoring presence/absence data
- Comparative analysis against baseline and subsequent monitoring WQM and rapid plot data
- Photographic comparison with baseline and previous monitoring images
- Efficacy of construction control measures
- Any disturbance observed within control sites or downstream sites
- Assessment against the performance indicators in Table 4
- Recommendations for any corrective actions required

Reports will be prepared by the Project Ecologist and provided to Transgrid. Reports may be provided to other agencies upon request. All Project reporting requirements and responsibilities are documented in Section 3.9.6 of the CEMP.

8. ARTIFICIAL HOLLOW MONITORING

Artificial hollows will be monitored on a bi-annual basis during the construction phase to determine their usage and efficacy per UMM B12. Monitoring of artificial hollows will be undertaken by the Project Ecologist to record the use of artificial hollows by fauna. During each monitoring event, a visual inspection of each artificial hollow is to be conducted, either by climbing the tree (with a ladder or rope access) or from the ground with an extendable endoscope. Endoscope will also be used if a visual inspection is not conclusive.

Table 11. Monitoring procedure for Artificial Hollows

Monitoring Activity	Description
Details of baseline data available	N/A
Details of baseline data to be obtained and when	Artificial hollow installation locations detailed in the Artificial Hollow Installation Report completed prior to monitoring commencement per Appendix E.
The frequency and timing of monitoring to be undertaken	Bi-annually during construction (in spring and autumn), based on timing of specific species breeding season.
The location of monitoring	Artificial hollow installation locations as detailed in the Artificial Hollow Installation Report completed prior to monitoring commencement per Appendix E.
Performance indicator	- Low rates (<2%) of artificial hollows being used by exotic or pest fauna species 100% of artificial hollows remain in working condition until construction completion
The reporting of monitoring results and analysis of results against relevant criteria	Reporting of monitoring results will include any evidence of fauna activity (scats, fur, feathers, nesting material, etc.), details of the species and number of individuals using the artificial hollows and any additional attributes if known (age, sex, etc.). Reporting will include an assessment of artificial hollow condition, any maintenance recommendations required per Section 8.1 and an assessment against the performance indicators above. Results of data analysis are to be included in an Artificial Hollow Monitoring Report prepared following each monitoring event.
Report/Record and Frequency	An Artificial Hollow Monitoring Report will be submitted bi-annually within three months of monitoring works completion
Trigger point for corrective actions	Performance indicators are not met
Procedures to identify and implement additional mitigation measures where the results of the monitoring indicate unacceptable Project impacts	Unless otherwise explained by non-Project associated impacts (e.g. extreme climate events, bushfires etc.), corrective actions will be required should the triggers be met. Depending on the cause of the decline, the Project Ecologist will determine the best course of action in consultation with Transgrid. Corrective actions may include: - A review of the location, type and number of artificial hollows installed, utilised and reassessment of recipient sites. - A review of artificial hollows design and/or placement on the tree to exclude undesirable species - Identifying the cause of artificial hollow failure and modifying as necessary. - Relocating artificial hollows or source suitable additional sites outside of the conservation area and recommence SHNS - Reinspect usage through monitoring with reference to performance parameters.
Response	Maintenance recommendations implemented to reduce rates of artificial hollows being used by exotic or pest fauna species to <2 per cent and ensure 100% of artificial hollows remain in working condition until construction completion.

8.1 MAINTENANCE REQUIREMENTS

Factors to be considered as part of the maintenance schedule:

- The need to remove exotic pest species (Termites, Common Mynas)
- Condition of the hollow opening and interior
- Condition of fastenings and structural integrity

- Replacement of fallen or damaged artificial hollows (record with GPS location)
- Re-positioning of artificial hollows
- Checking each artificial hollow is not holding water
- Removing excess nesting material.

There is no specific maintenance required for removing European Honeybees from artificial hollows. Eventually, bees will abandon their hives, allowing the hollow to be reused by native species (Goldingay et al. 2020a).

Any requirement to maintain or replace artificial hollows due to deterioration or invasion by pest species will also be assessed based on the viability of the artificial hollow to continue to be used by the target species. Where longer-term use is considered unviable, consideration and assessment will be made to determine if artificial hollow replacement is required. Maintenance and replacement of artificial hollows will be undertaken prior to the next monitoring period (subject to supply of replacement hollow).

Any longer-term maintenance and monitoring (post-construction) including any required discussions with individual landowners would be detailed within the Operational Environmental Management Plan.

At construction completion, the final Artificial Hollow Monitoring Report will include an evaluation of the performance of artificial hollows—developed in consultation with Transgrid and the Project Ecologist—and provide recommendations on whether to continue monitoring during the operational phase or cease the program if the objectives of the HRNB Strategy have been met. This evaluation will also include a reassessment of the design and placement of artificial hollows and offer recommendations to inform any future replacement hollow programs.

8.2 REPORTING

An Artificial Hollow Monitoring Report will be submitted bi-annually within three months of monitoring works completion. The following information is to be collected and compiled within the report:

- The name of the observer
- Date
- Weather conditions
- Type of artificial hollow
- Artificial hollow number and location
- Evidence of fauna activity (scats, fur, feathers, nesting material, etc.)
- Species using the artificial hollows and any additional attributes if known (age, sex, etc.)
- Number of individuals
- Assessment of artificial hollow condition
- Assessment against the performance indicators in Table 11
- Recommendations for any maintenance and/or corrective actions required

At construction completion, the final Artificial Hollow Monitoring Report will also include an evaluation of the performance of artificial hollows made in consultation with Transgrid and the Project Ecologist. This should include a reassessment of artificial hollow design and placement and provide recommendations for future replacement hollow programs.

The report will be prepared by the Project Ecologist and provided to Transgrid. Reports may be provided to other agencies upon request. All Project reporting requirements and responsibilities are documented in Section 3.9.6 of the CEMP.

9. GLIDER POLE MONITORING

Monitoring must be conducted two times annually for the duration of construction following pole installation or until the poles have been deemed either successful, or unsuccessful, in which case corrective actions would be required. The success of the poles will be determined by the Project Ecologist in consultation with CPHR.

Monitoring will involve the use of pole mounted cameras to ascertain the movement of individuals and identify any successful crossings. The primary purpose of the monitoring program is to determine whether the glide poles are working as intended to facilitate crossing of Squirrel Glider, Yellow-bellied Glider and Southern Greater Glider from one side of the transmission line easement to the other. If successful crossings by an individual is recorded, then it can be inferred that the transmission line is not acting as a barrier to genetic exchange.

The monitoring procedure is provided in Table 12.

Table 12. Goals, mitigation measures, performance indicators and corrective actions.

Monitoring Activity	Description
Details of baseline data available	Species records obtained during targeted surveys for the BDAR/ SBAS within each chosen corridor will be used to determine whether threatened gliders are present.
Details of baseline data to be obtained and when	If no targeted surveys have been undertaken within the chosen corridor, stag watches and spotlighting will be undertaken in and within 200m of the corridor prior to construction.
The frequency and timing of monitoring to be undertaken	Bi-annually in late autumn and late spring for a period of 60 days. Monitoring will continue for the duration of construction or until poles have been deemed successful /unsuccessful.
The location of monitoring	On a minimum of three poles per corridor/ crossing.
Performance indicator	- Evidence of use of glider poles by gliders known to occur in the Project area - The complete passage of the target species or other arboreal mammals on at least one occasion in order to demonstrate opportunity for dispersal and recolonisation
The reporting of monitoring results and analysis of results against relevant criteria	During construction, monitoring data will be provided to Transgrid as part of regular environmental reports. Reports will be compiled by Project Ecologists that outline the following: - Results of monitoring - Assessment of the overall success of the mitigation measures installed - Identification of gaps or limitations to the biodiversity monitoring methodology. This includes monitoring components, method of data collection (frequency and location), method of data, analysis and reporting requirements. - Provision of recommendations for adjustments to monitoring techniques, timing and locations.
Report/Record and Frequency	Bi-annually within three months of the completion of the monitoring event.
Trigger point for corrective actions	After two rounds of monitoring, no indication of successful crossing of the glider species recorded within the corridor from the baseline surveys.
Procedures to identify and implement additional mitigation measures where the results of the monitoring indicate unacceptable Project impacts	Unless otherwise explained by non-Project associated impacts (e.g. extreme climate events, bushfires etc.), corrective actions will be required should the trigger be met. The Project Ecologist will determine the best course of action in consultation with Transgrid. Corrective actions may include: - A review of the location, type and number of glider poles installed. - A review of glider pole design. - Translocation of gliders.
Response	Successful crossing of gliders within the corridor.

9.1 REPORTING

9.1.1 GLIDER POLE MONITORING REPORT

A Glider Pole Monitoring Report will be submitted bi-annually within three months of each monitoring round. The following information is to be collected and compiled within the report:

- The name of the observer
- Date
- Weather conditions
- Monitoring sites
- Detailed description of monitoring methodology
- Results of the monitoring period
- Discussion of results, including how the results compare against performance measures, if any modifications to timing or frequency of monitoring periods or monitoring methodology are required and any other recommendations
- If contingency measures should be implemented
- Recommendations for ongoing operational monitoring post construction

Reports will be prepared by the Project Ecologist and provided to Transgrid. Reports may be provided to other agencies upon request. All Project reporting requirements and responsibilities are documented in Section 3.9.6 of the CEMP.

10. CONNECTIVITY CORRIDOR PERFORMANCE

Connectivity corridors with a moderate or high impact, as determined through connectivity validation reporting (Appendix F, Connectivity Strategy) will be monitored for performance throughout construction as agreed with CPHR during the review of the corridor validation reports.

11. SAI MITIGATION MONITORING

The Revised BDAR identified 16 candidate Serious and Irreversible Impact (SAI) entities within the HLE Project footprint, including 4 Threatened Ecological Communities (TECs), 9 threatened flora species and 3 threatened fauna species. Of these candidate SAI entities, the Project was determined to result in a likely SAI to 1 TEC, White Box-Yellow Box-Blakely's Red Gum Grassy Box Woodland and Derived Native Grassland (listed under both the BC Act and the EPBC Act), and no threatened flora and fauna species. The candidate SAI TECs are provided in Table 3.

Impacts to all candidate SAI entities will be avoided and minimised through the mitigation measures outlined in Section 7.14 of the BMP. Additional mitigation measures and monitoring for the likely SAI entity within the HLE Project footprint (White Box-Yellow Box-Blakely's Red Gum Grassy Box Woodland and Derived Native Grassland) will be implemented in Transgrid's delivery of the Local Area Management Plan (LAMP), detailed the Transgrid proposal 'AAM - HumeLink's SAI - letter to BCD - September 2024_FINAL_v1'. The LAMP aims to deliver a landscape-scale restoration project and management program by establishing ecological connectivity within a currently fragmented landscape to compensate for SAI impacts. The LAMP will include the following key elements:

- Scientific review
- Extensive landholder engagement and co-design
- Development of a LAMP, mapping, Restoration Management Plan, and management plan
- Establishment of a key stakeholders committee
- Engagement of a network of landholders
- Provision of seed-funds
- Establishment of long-term funding structures
- Implementation of a monitoring program to measure project success against LAMP performance targets and facilitate adaptive management.

The LAMP will be prepared and delivered by Transgrid, separate to this BMP.

Other monitoring methods to assess the effectiveness of mitigation measures in minimising impacts to TECs and threatened species, including all identified SAI entities, are captured within the monitoring procedures detailed in the above sections of this Program. The described monitoring will ensure impacts are minimised, within predicted limits, and determine whether any additional mitigation measures are required.

As detailed in Section 7.2 of the BMP, Transgrid will prepare a Supplementary Biodiversity Strategy (SBS) and a Biodiversity Assessment Verification Report (BAVR), prior to the commencement of any works that may impact relevant biodiversity values. The SBS and BAVR will detail targeted SAI survey methods and outcomes to confirm the extent and presence of SAI entities within the Project, and recommend additional impact mitigation measures. The BMP, including this Program, will be updated where necessary in accordance with the outcomes of the BAVR.

12. ADAPTIVE MANAGEMENT

An adaptive management approach is to be employed in respect of the works forming part of this Program. An adaptive management approach involves an integrated process of monitoring, reviewing and then responding to the efficacy of the methodology and management measures to identify any alterations to the design and maintenance of works that may be required to ensure the objectives of the Program are achieved.

Where monitoring indicates that the construction works are having or could have a greater impact than approved, the Environment and Sustainability Manager and Construction Manager will review the results of the monitoring program and take action as soon as reasonably practicable to prevent further impacts. This may include implementing measures such as a stopping relevant work activity, delineation, additional training, changing construction methodology or redesigning certain elements of the project.

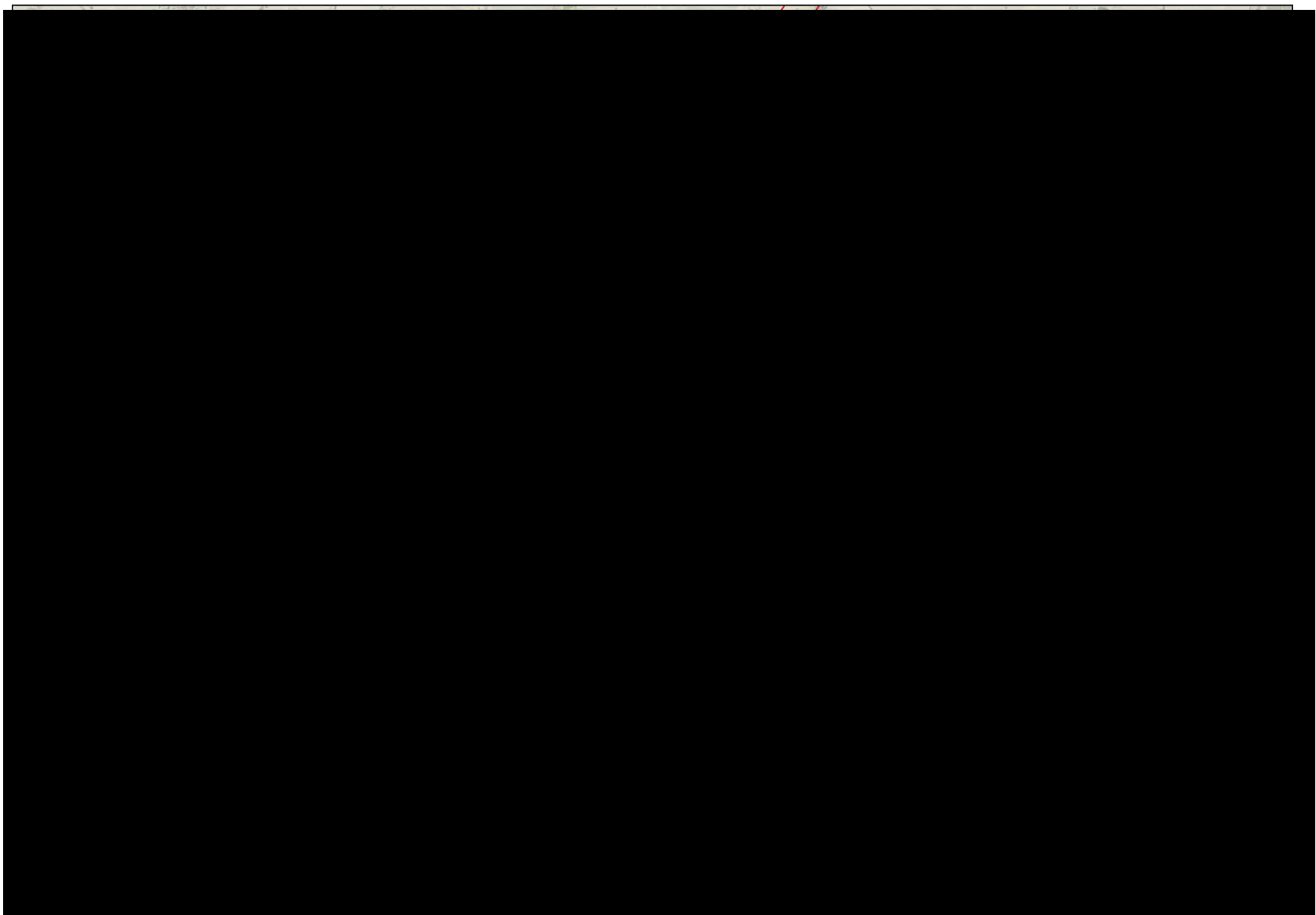
13. BIODIVERSITY MONITORING PROGRAM

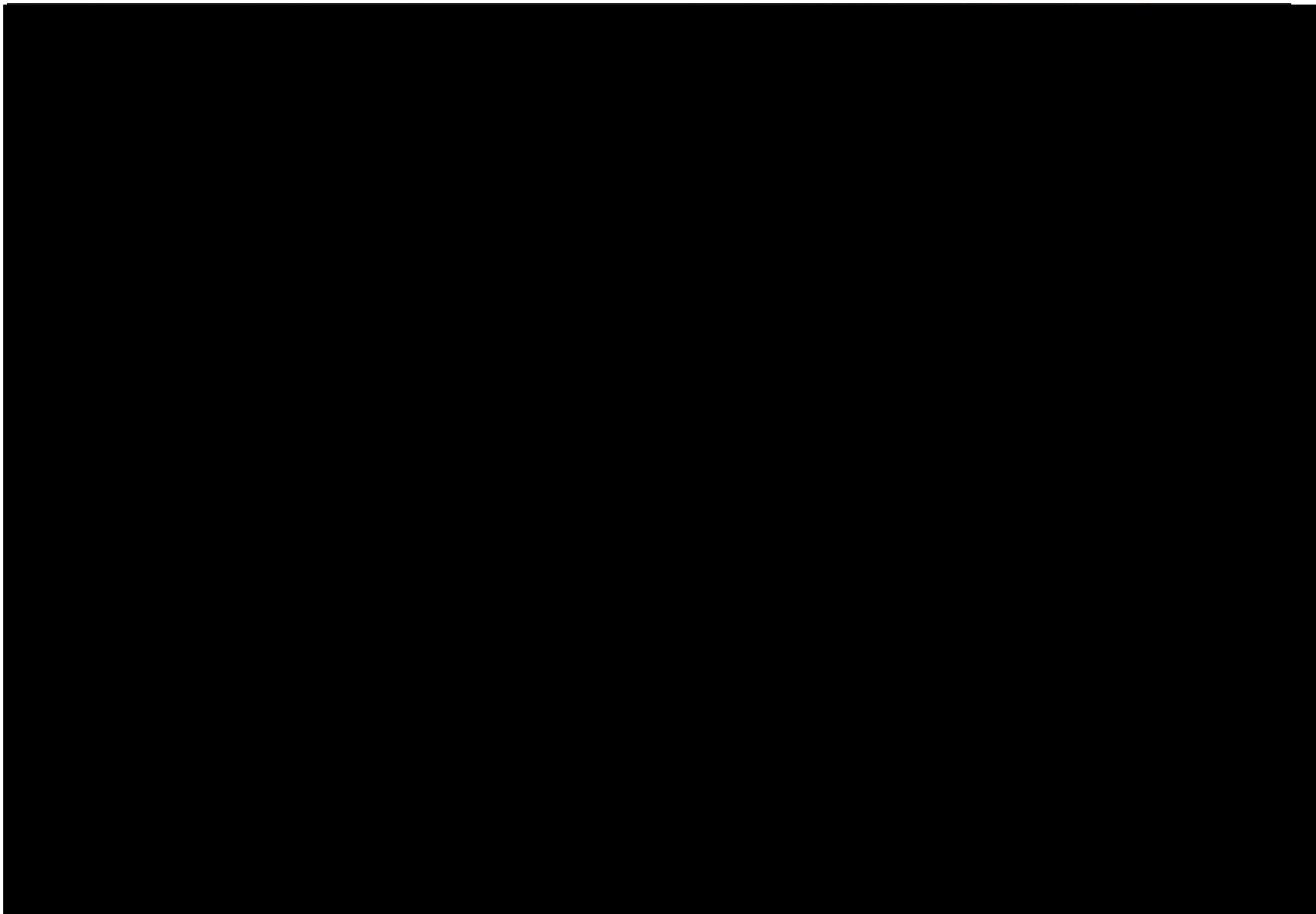
A detailed biodiversity monitoring program in line with SMART principles is provided within Table 13. The program also provides a Trigger Action Response Plan (TARP) with trigger levels and required actions to ensure that the biodiversity-related objectives of the Project are met.

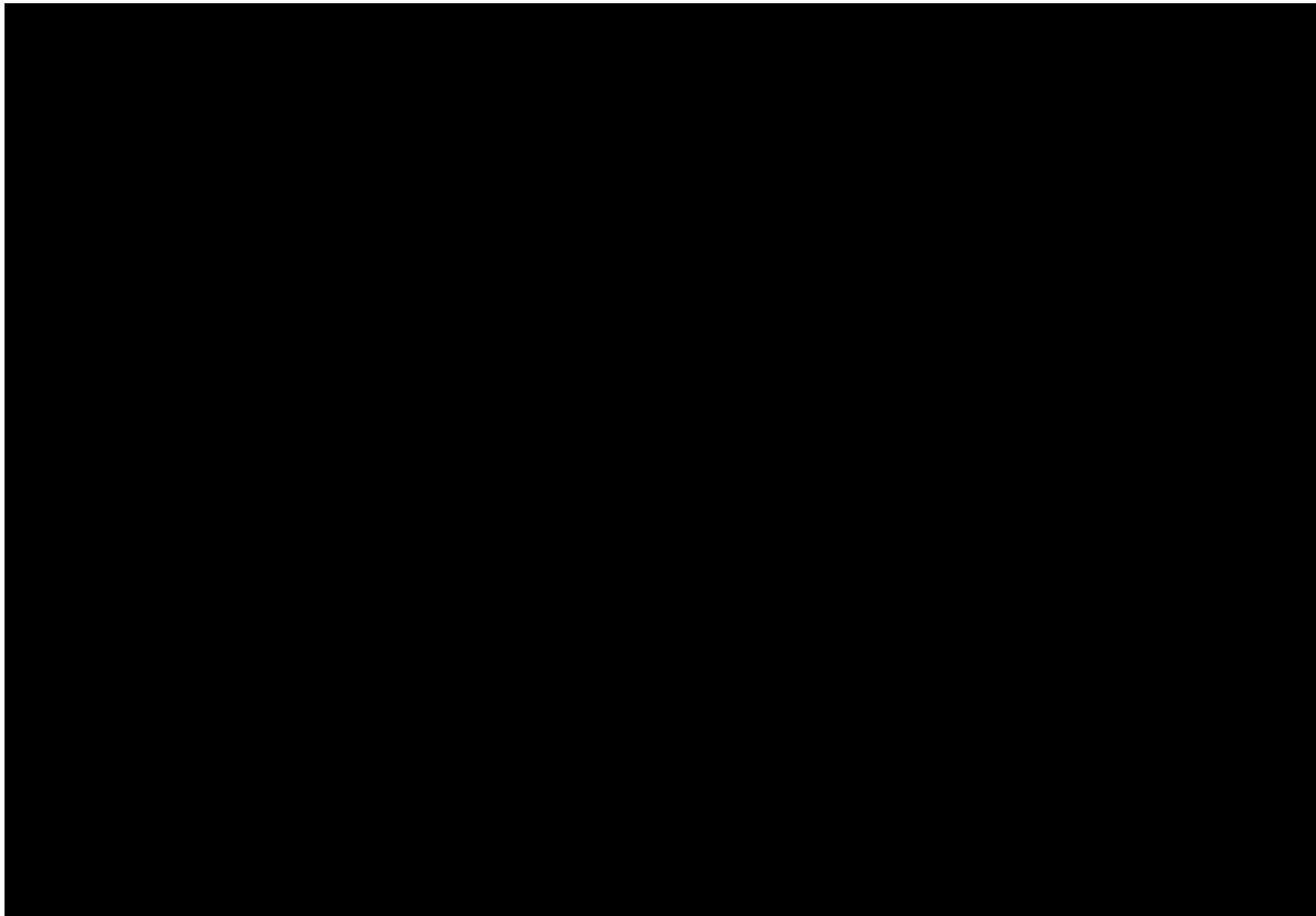
Table 13. Summary of biodiversity monitoring program, TARP and adaptive management

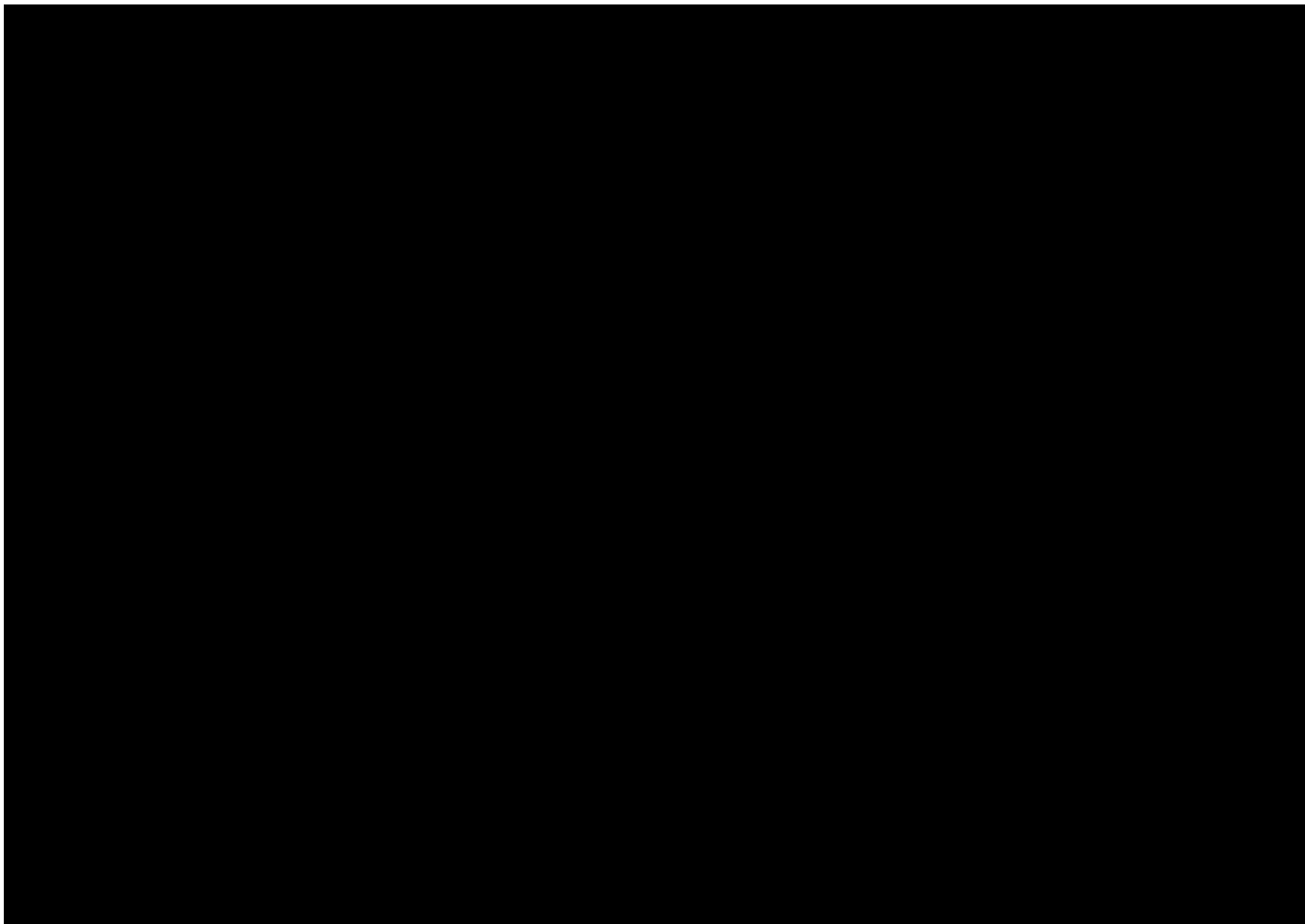
Monitoring ID	Monitoring Requirement	Location	Timing (Project Phase)	Responsibility	Baseline Data and Monitoring Method	Monitoring Frequency/Timing	Performance indicators	Record/Report	Recipient	Trigger point for corrective actions (measurable threshold)	Adaptive Action / Response	Relevant CoA or UMM/AMM
MON1	Partial Clearance Areas Progressive Monitoring	Refer Table 4	Construction	Project Ecologist Environmental and Sustainability Manager	Refer Table 4	Annual	Refer Table 4	Partial Clearing Validation Report – Quarterly	Transgrid	Refer Table 4	Refer Table 4	CoA B30, B25
MON2	Weed, Pathogen and Pest Monitoring	Refer Table 5	Preconstruction Construction	Project Ecologist Environmental and Sustainability Manager	Refer Table 5	Annual	Refer Table 5	Pre-clearing Survey Report - Once Weed, Pathogen and Pest Monitoring Report - Annually	Transgrid	Refer Table 5	Refer Table 5	CoA B30 UMM B3, B22 AMM 3 AMM 4 AMM 5 AMM 6
MON3	Rehabilitation Monitoring	Refer Table 6	Preconstruction Construction	Environment and Sustainability Manager Ecologist	Refer Table 6	Quarterly	Refer Table 6	Rehabilitation Monitoring Report – Quarterly Environmental Inspection Checklists – Weekly Soil Conservationist Inspection Report – as required	Transgrid	Refer Table 6	Refer Table 6	UMM B9
MON4	Threatened Flora Monitoring	Refer Table 7	Preconstruction Construction	Environment and Sustainability Manager Ecologist	Refer Table 7	Bi-annual	Refer Table 7	Threatened Flora Monitoring Report – Bi-annual	Transgrid	Refer Table 7	Refer Table 7	UMM B25
MON5	Threatened Frog Monitoring	Refer Table 10	Preconstruction Construction	Environment and Sustainability Manager Ecologist	Refer Table 10	Bi-annual	Refer Table 10	Threatened Frog Baseline Monitoring Report – Once Threatened Frog Monitoring Report – Bi-annual	Transgrid	Refer Table 10	Refer Table 10	UMM B8, B25
MON6	Artificial Hollow Monitoring	Refer Table 11	Construction	Environment and Sustainability Manager Ecologist	Refer Table 11	Annual	Refer Table 11	Artificial Hollow Installation Report – Once Artificial Hollow Monitoring Report - Annual	Transgrid	Refer Table 11	Refer Table 11	UMM B12, B25 AMM 2
MON7	Glide Pole Monitoring	Refer Table 12	Construction	Environment and Sustainability Manager Ecologist	Refer Table 12	Bi-annual	Refer Table 12	Glider Pole Monitoring Report – Bi-annual	Transgrid	Refer Table 12	Refer Table 12	CoA B30 UMM B10
MON 8	Bird Deterrent Device Monitoring	Refer to BMP Section 7.13	Construction	Environment and Sustainability Manager Ecologist	Check to ensure damaged or missing units are identified and replaced	Bi-annual	Check to ensure damaged or missing units are identified and replaced	Bird Deterrent Device Report – Bi Annual	Transgrid	Damaged or missing device	Replacement	UMMB11

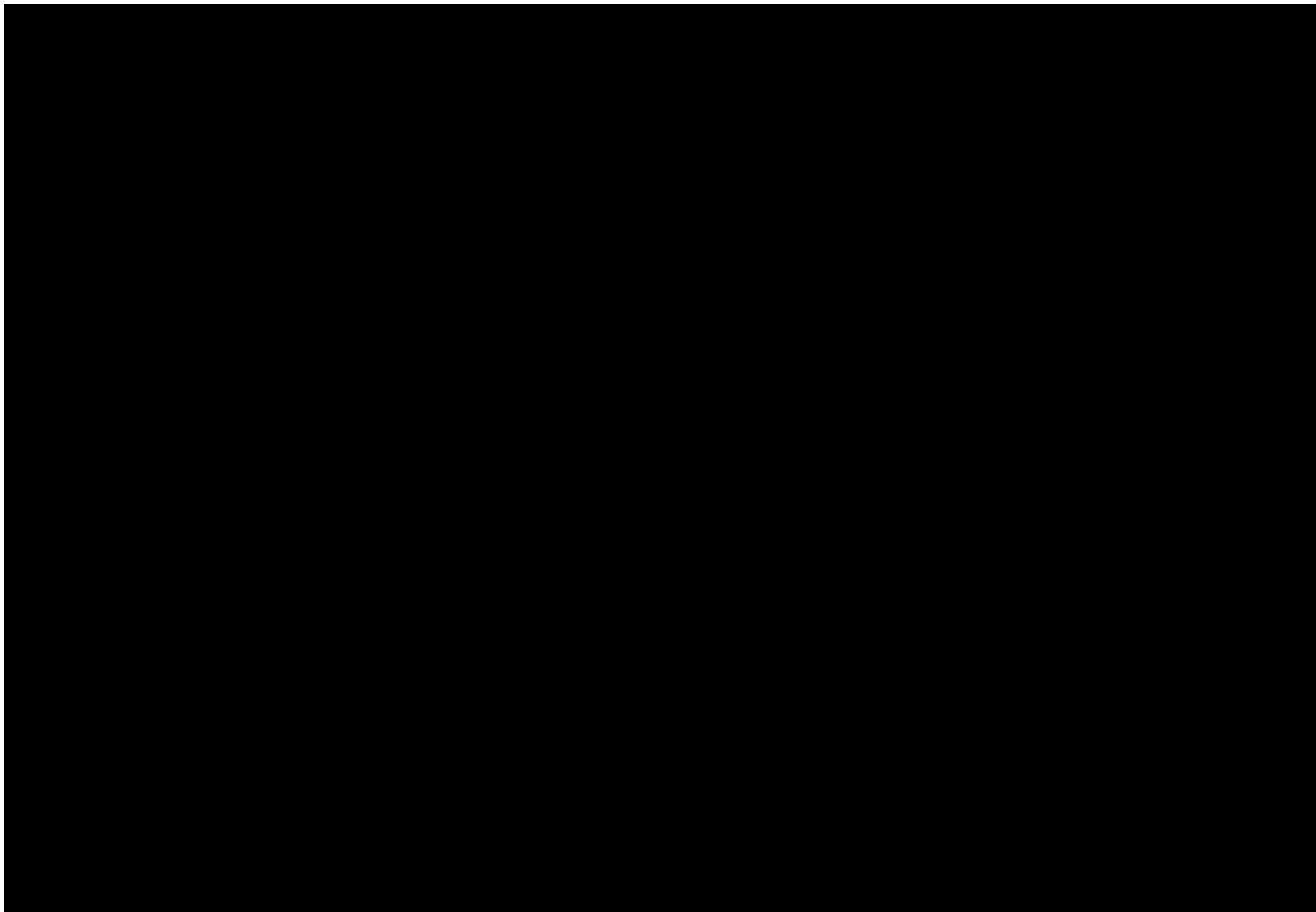
APPENDIX A: THREATENED INSECT REHABILITATION SITES

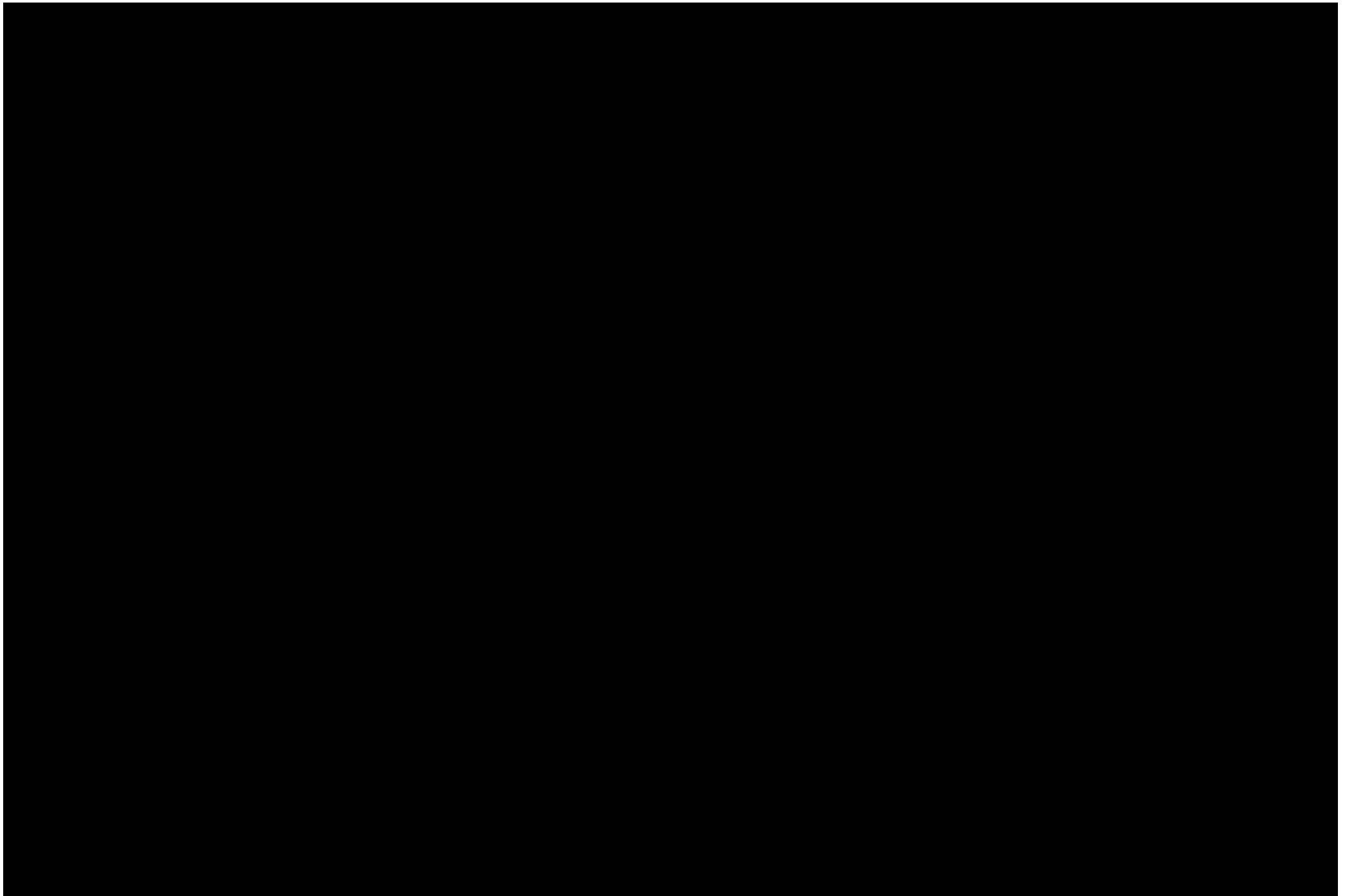


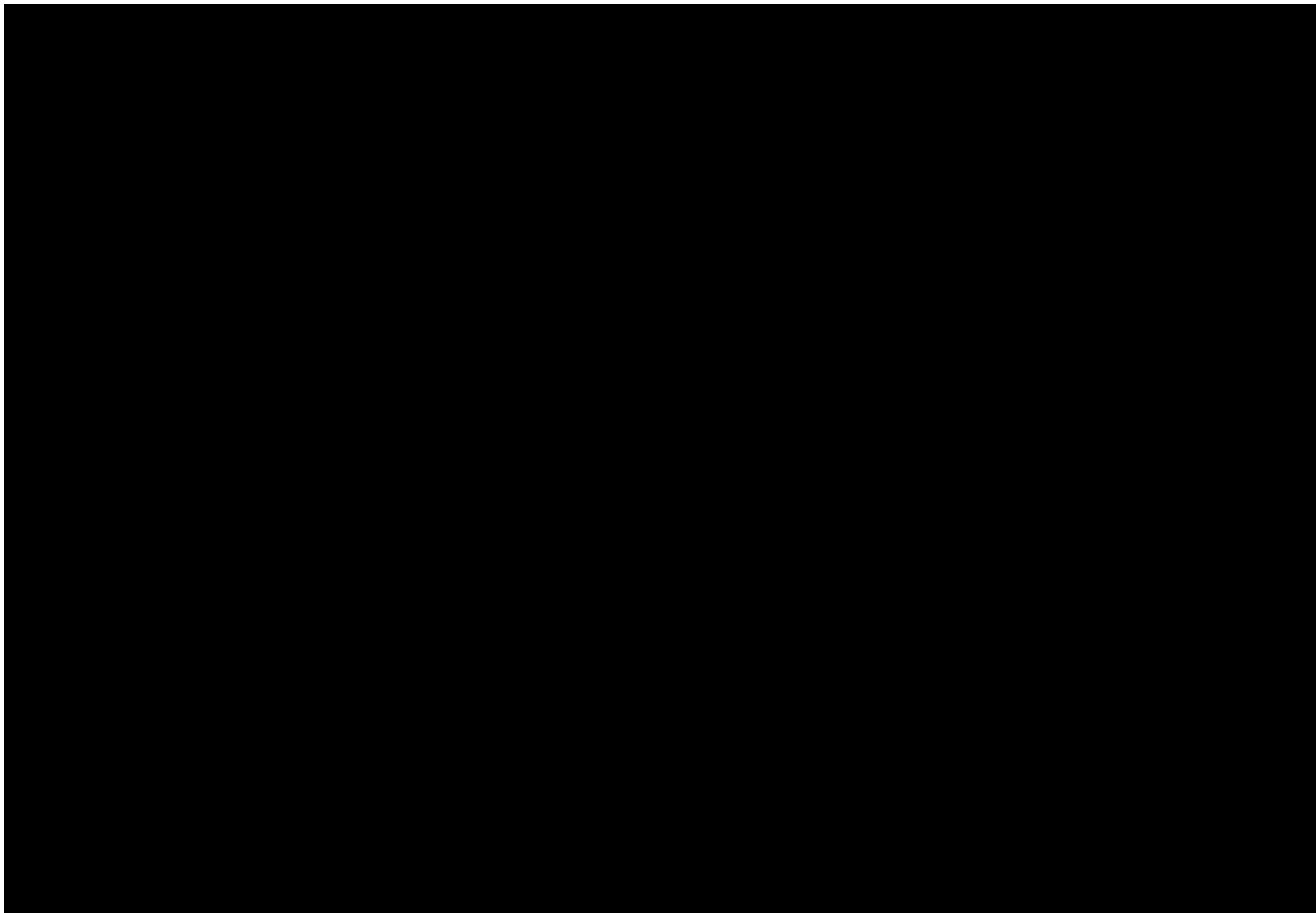


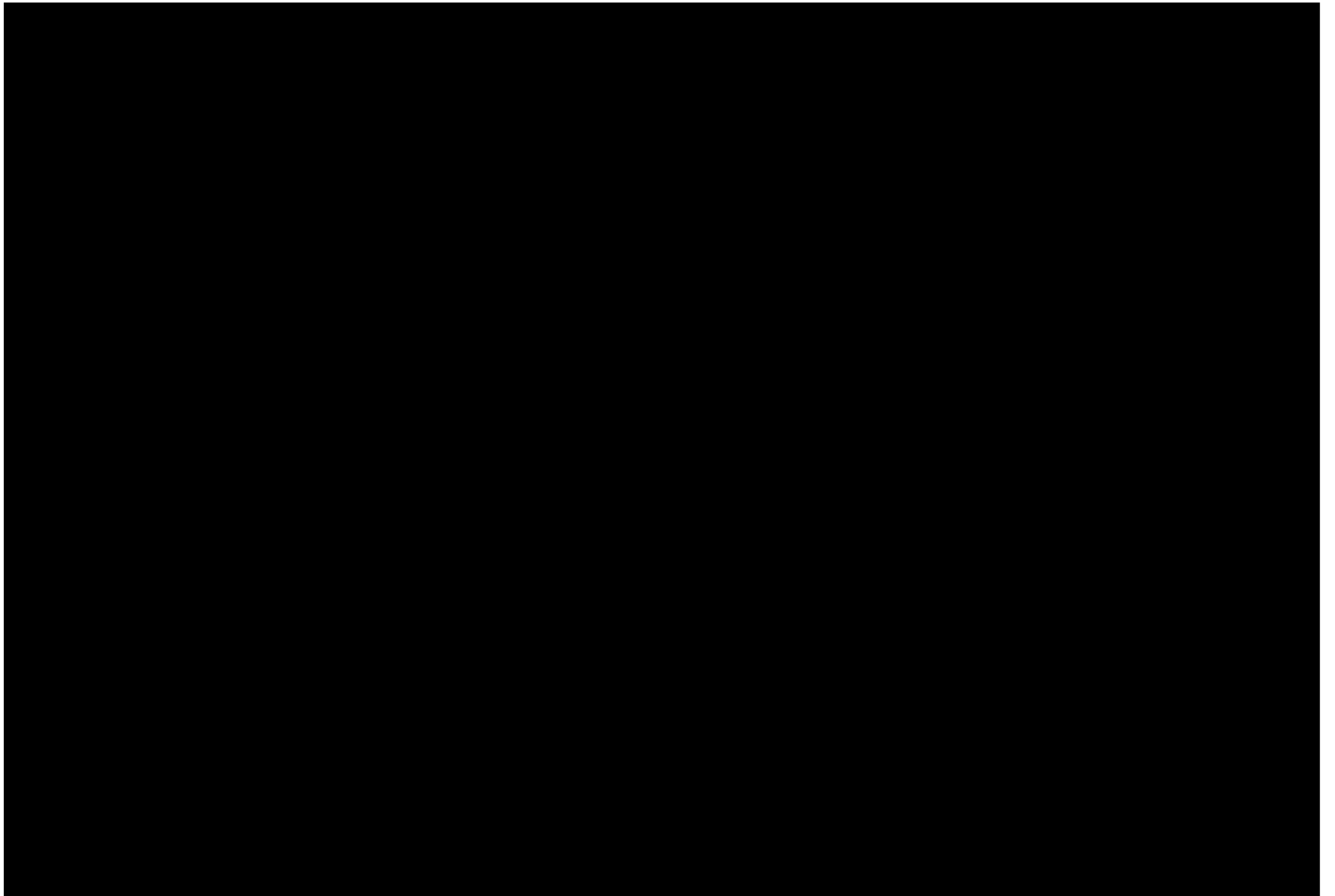


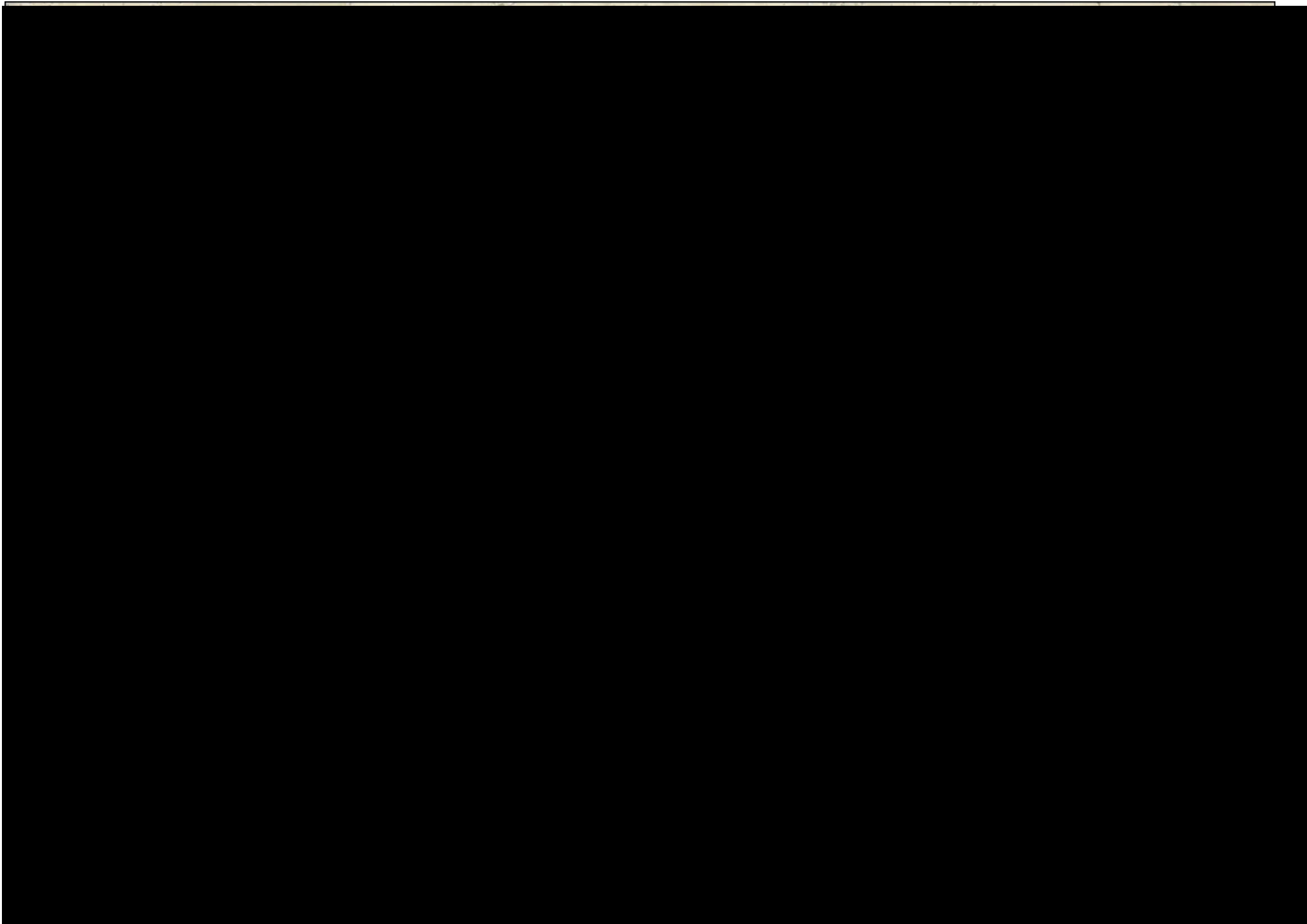


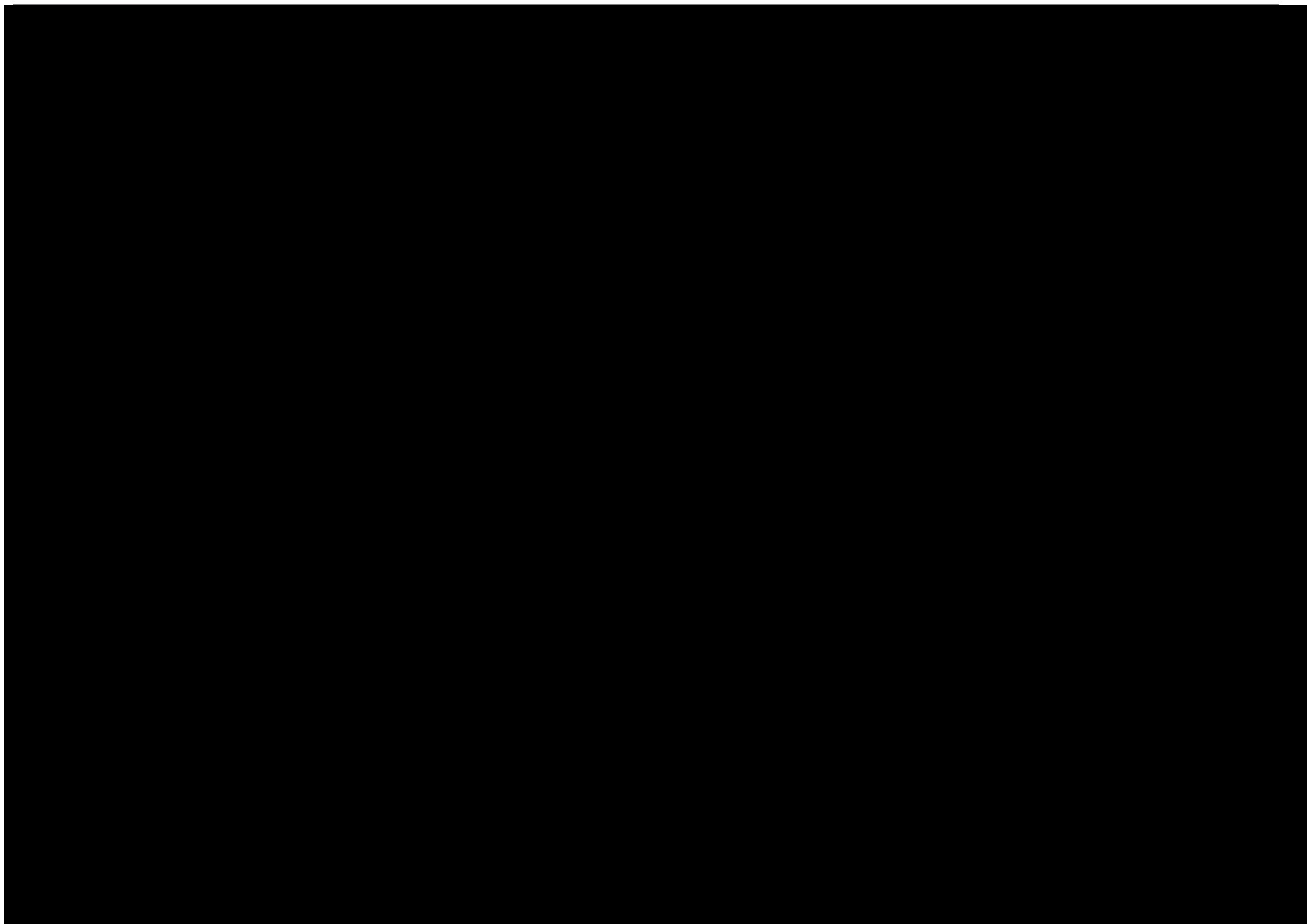




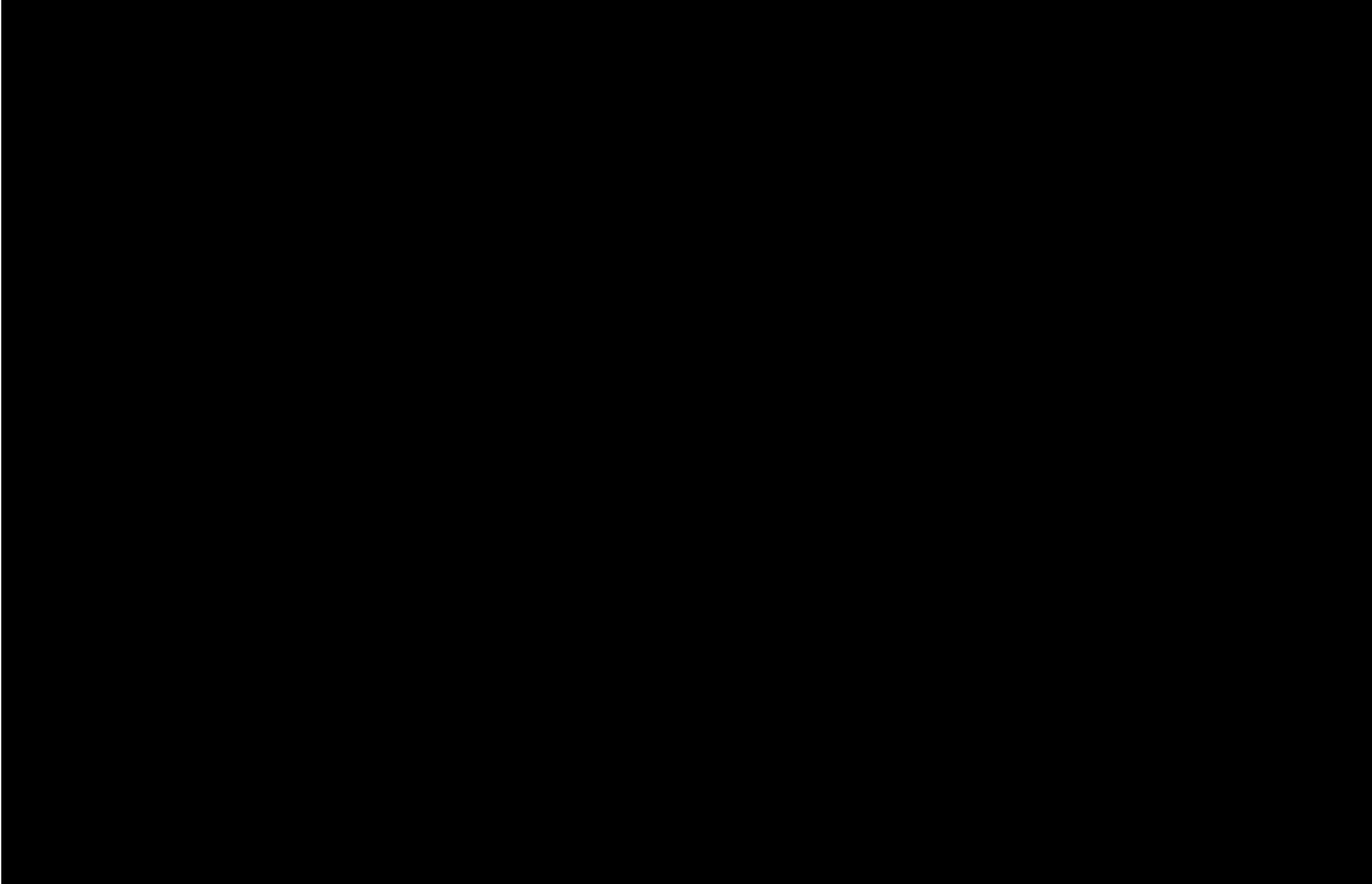


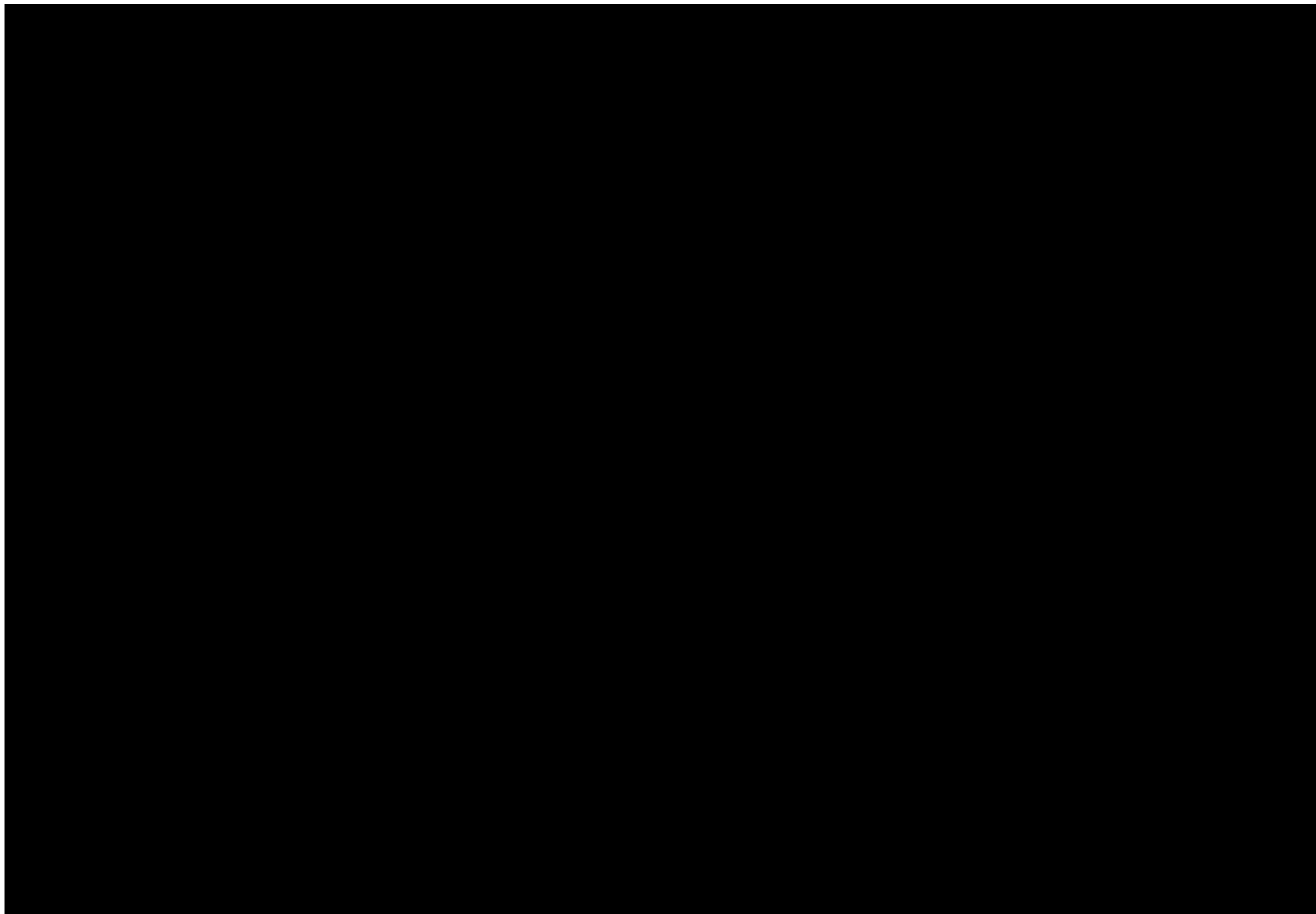


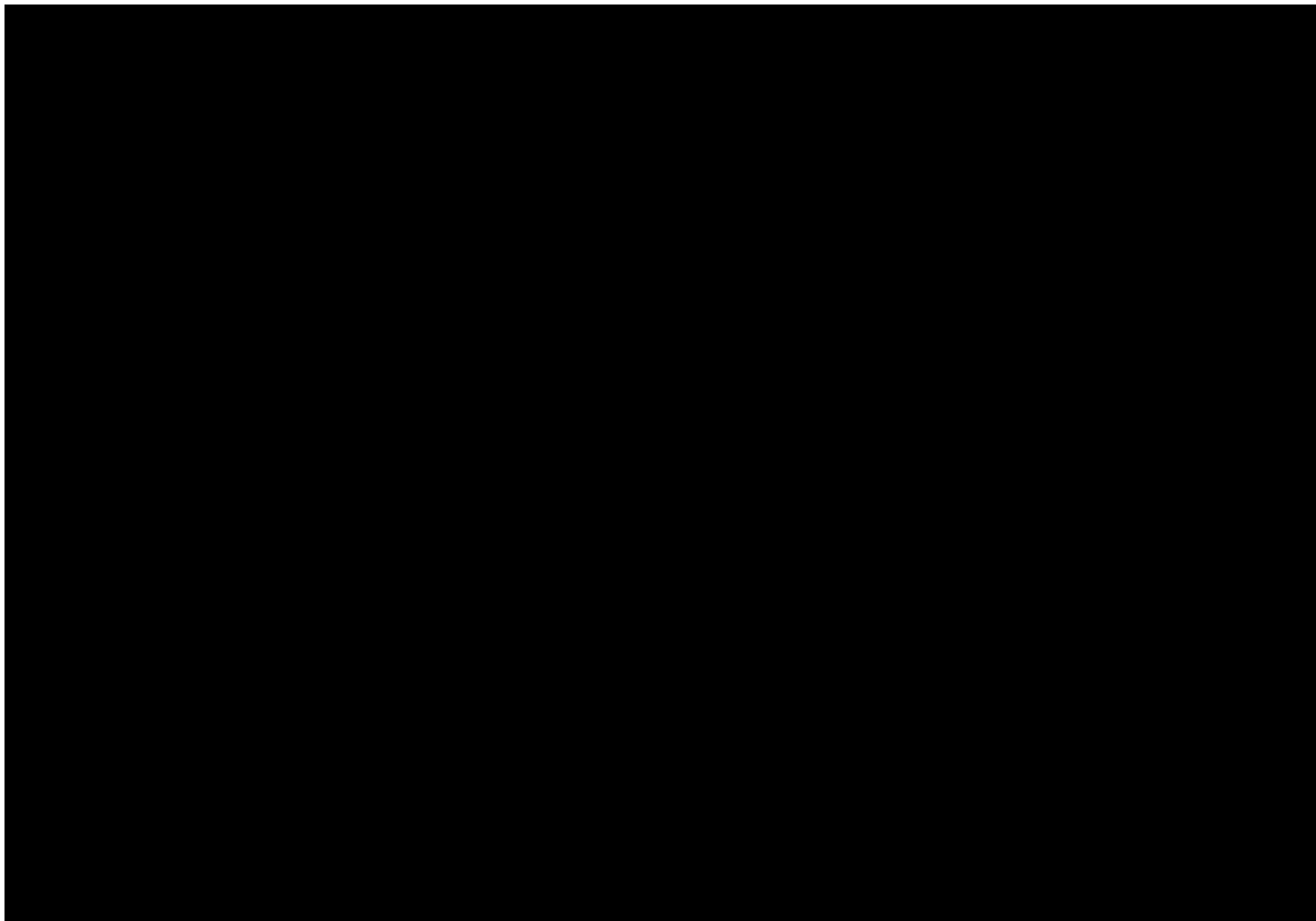


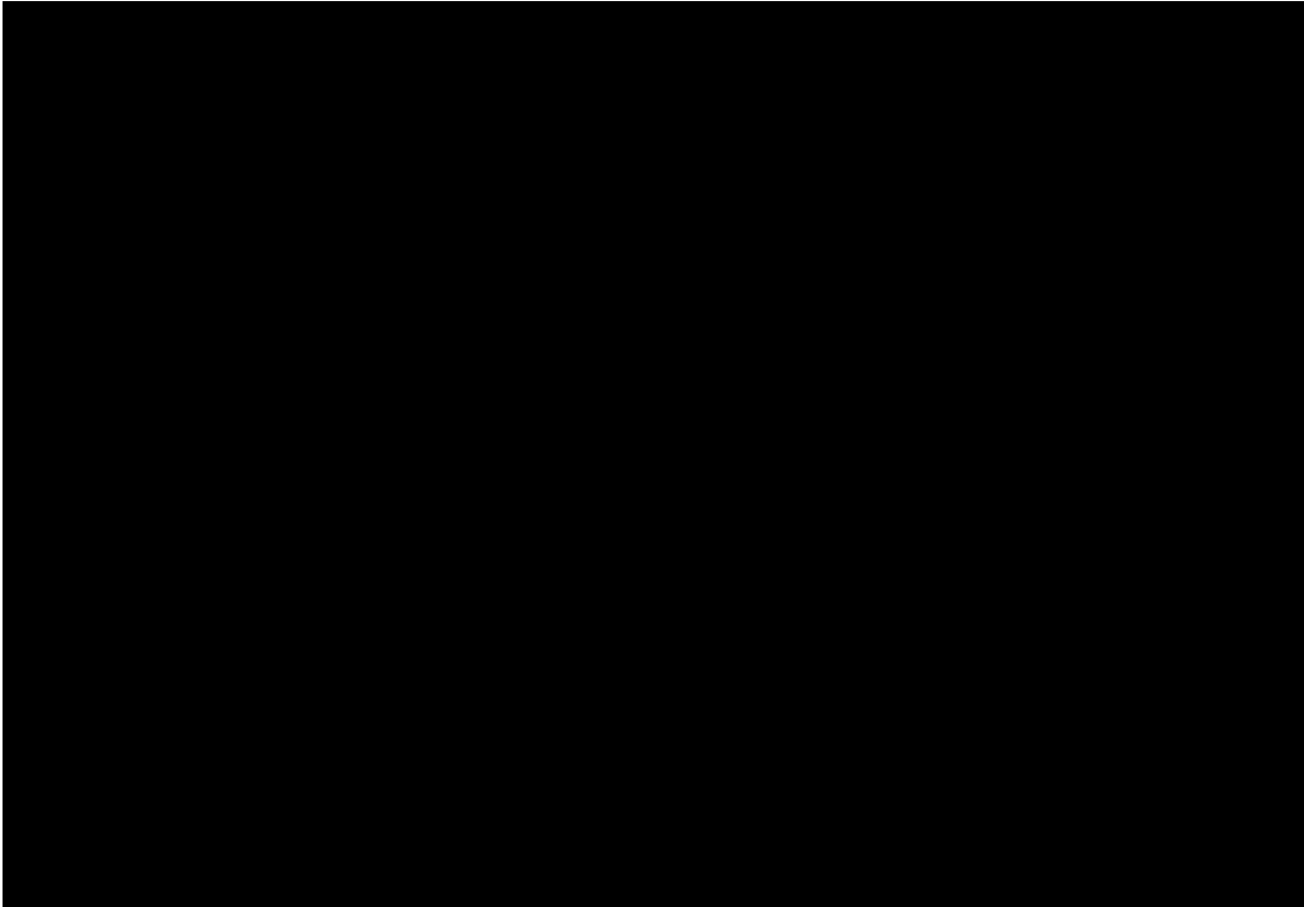


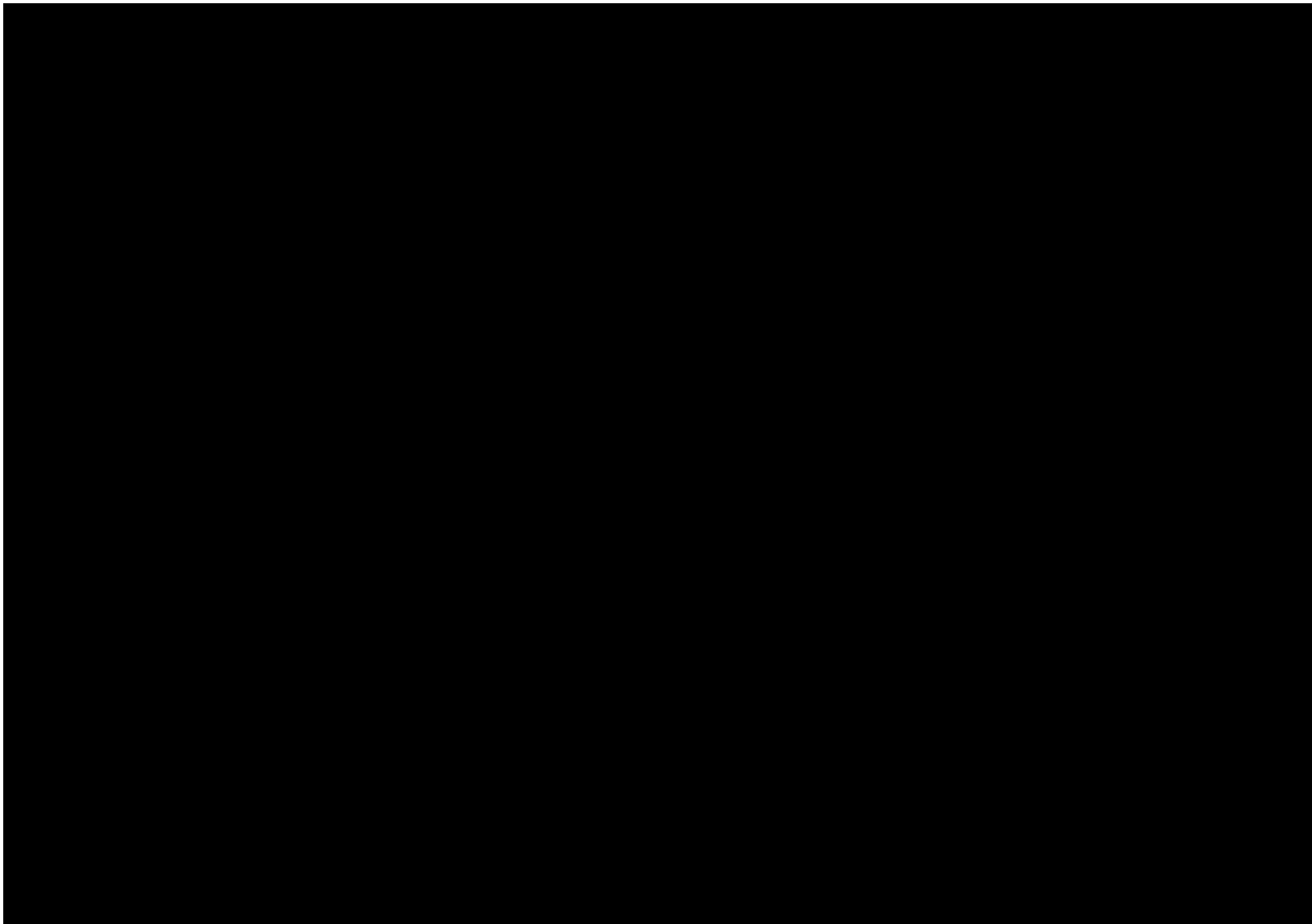


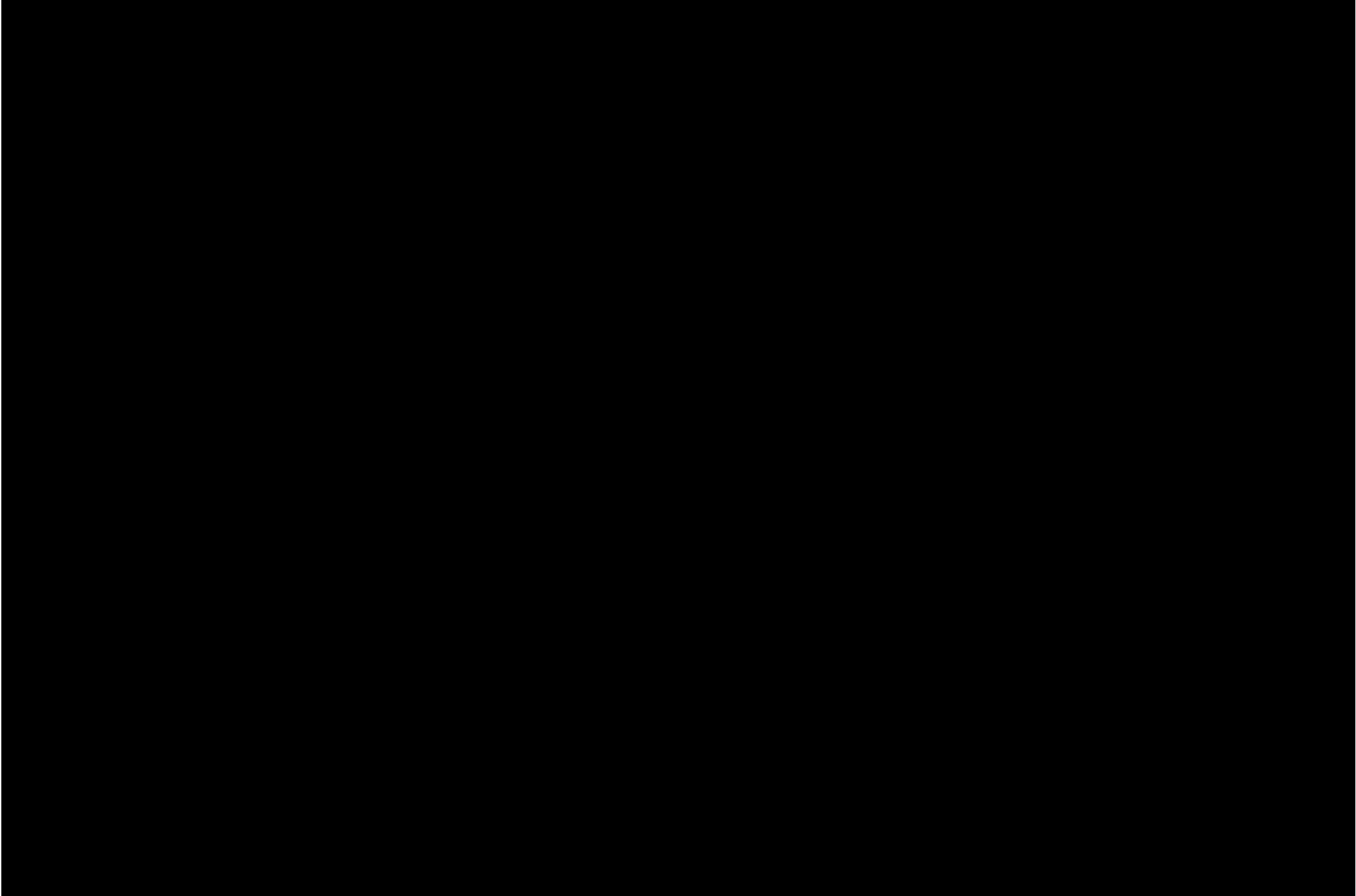




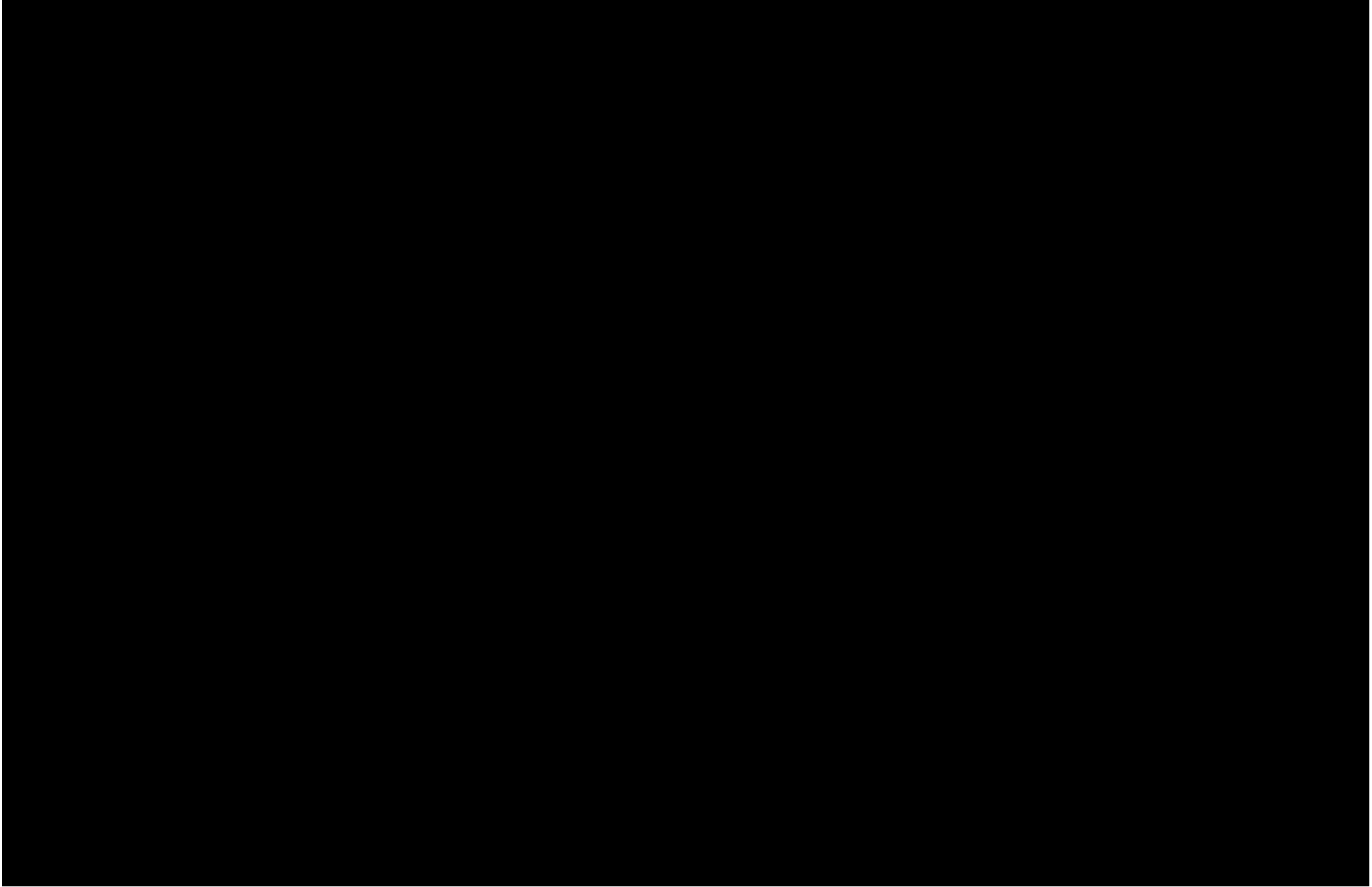




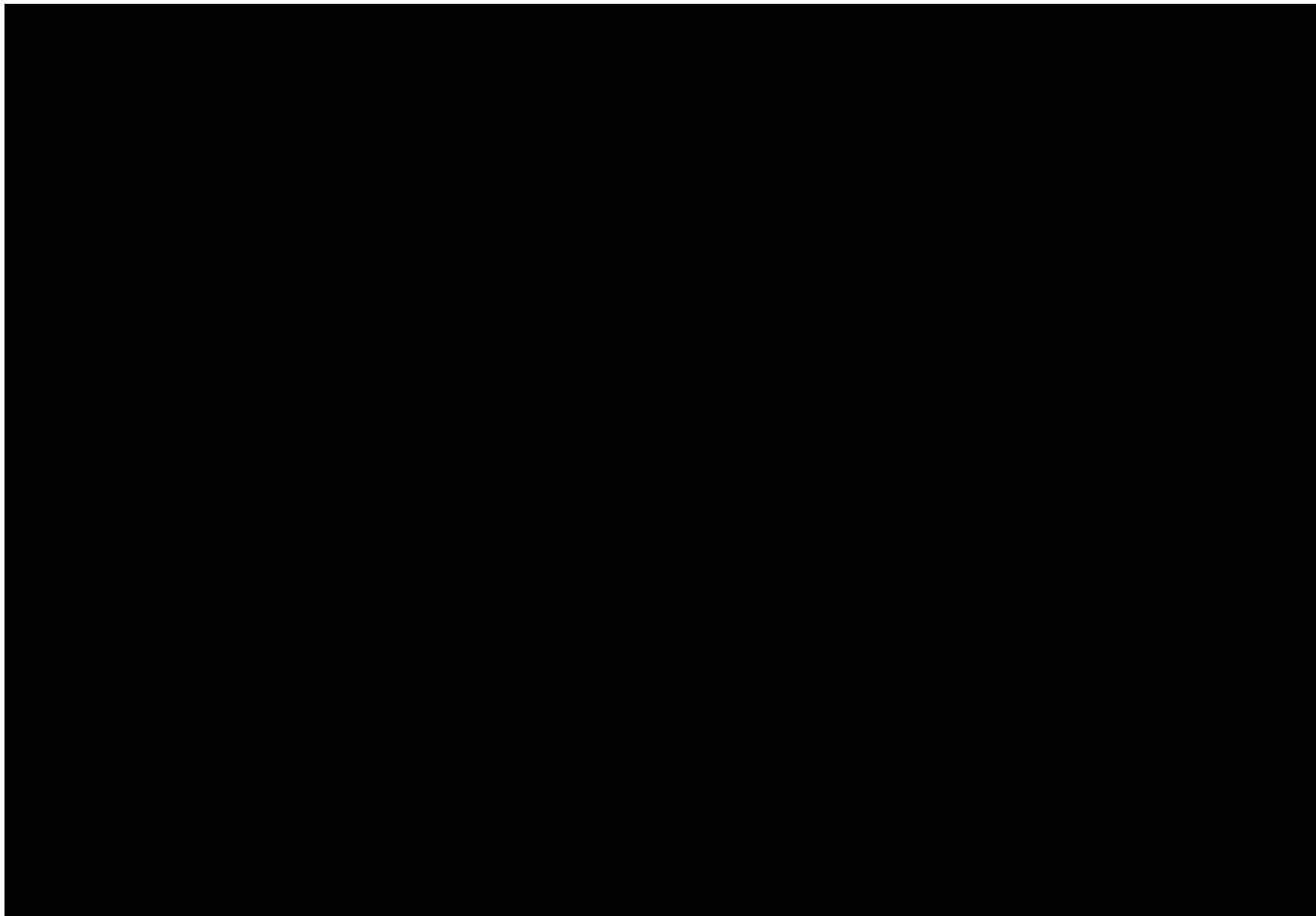


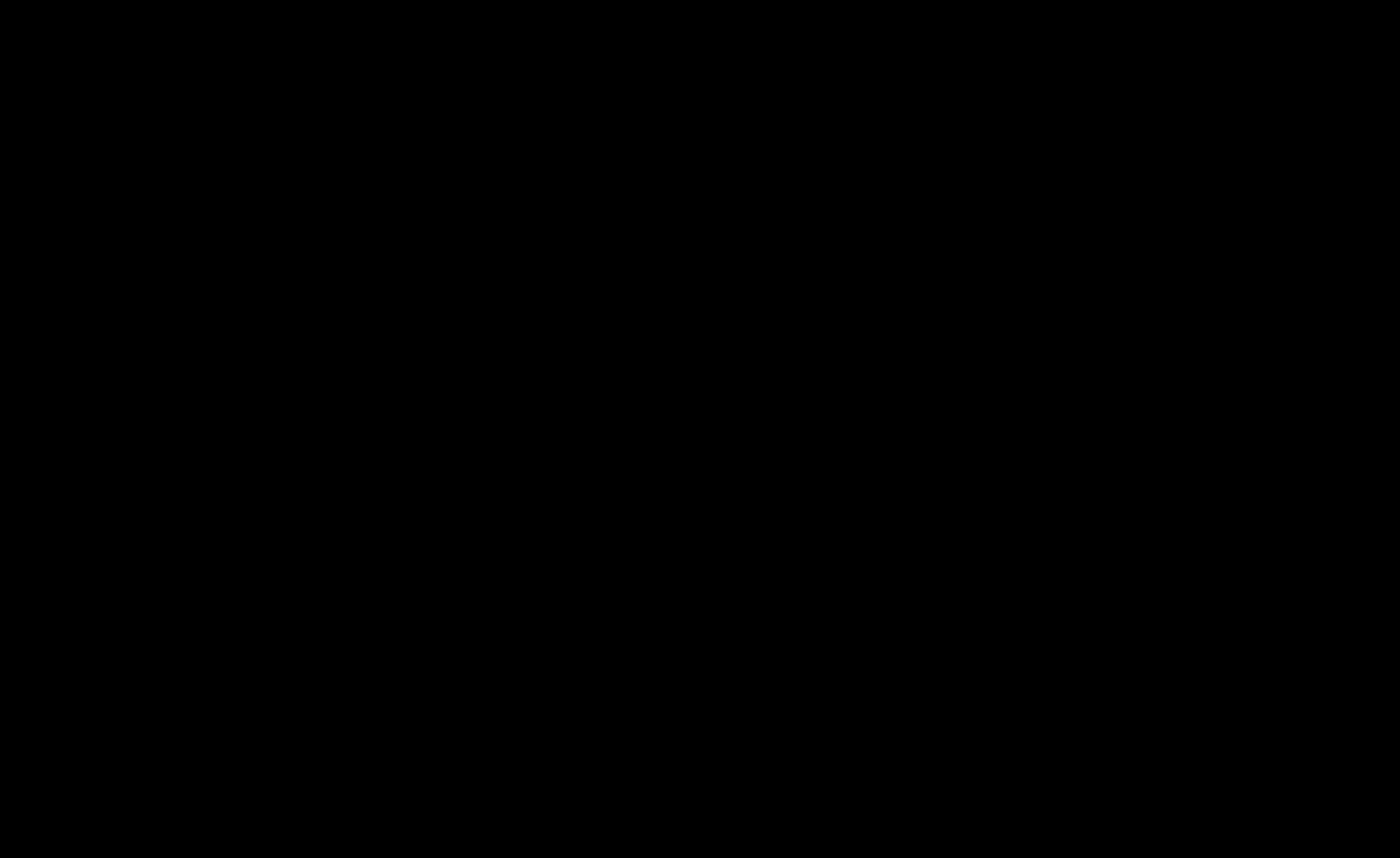




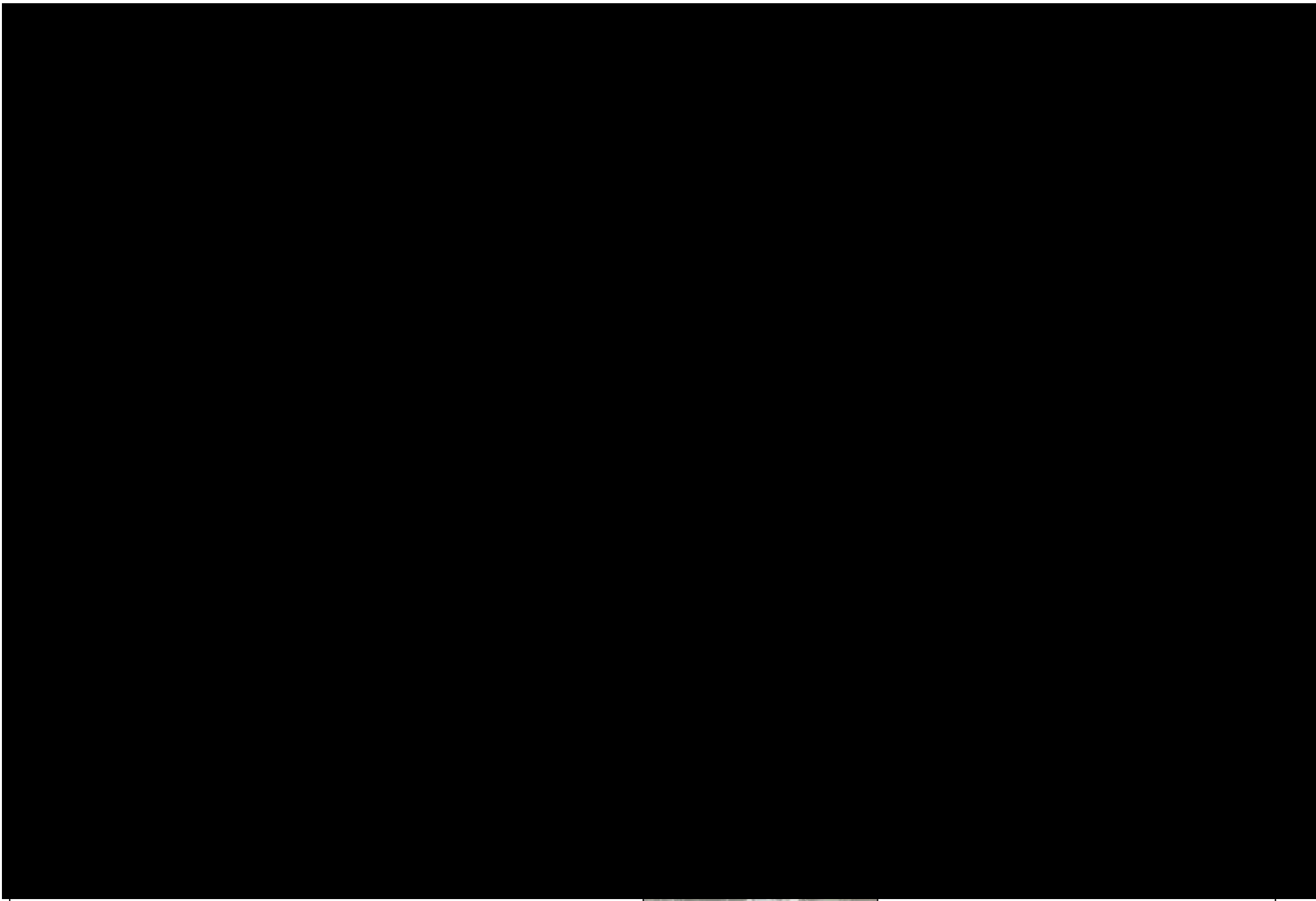


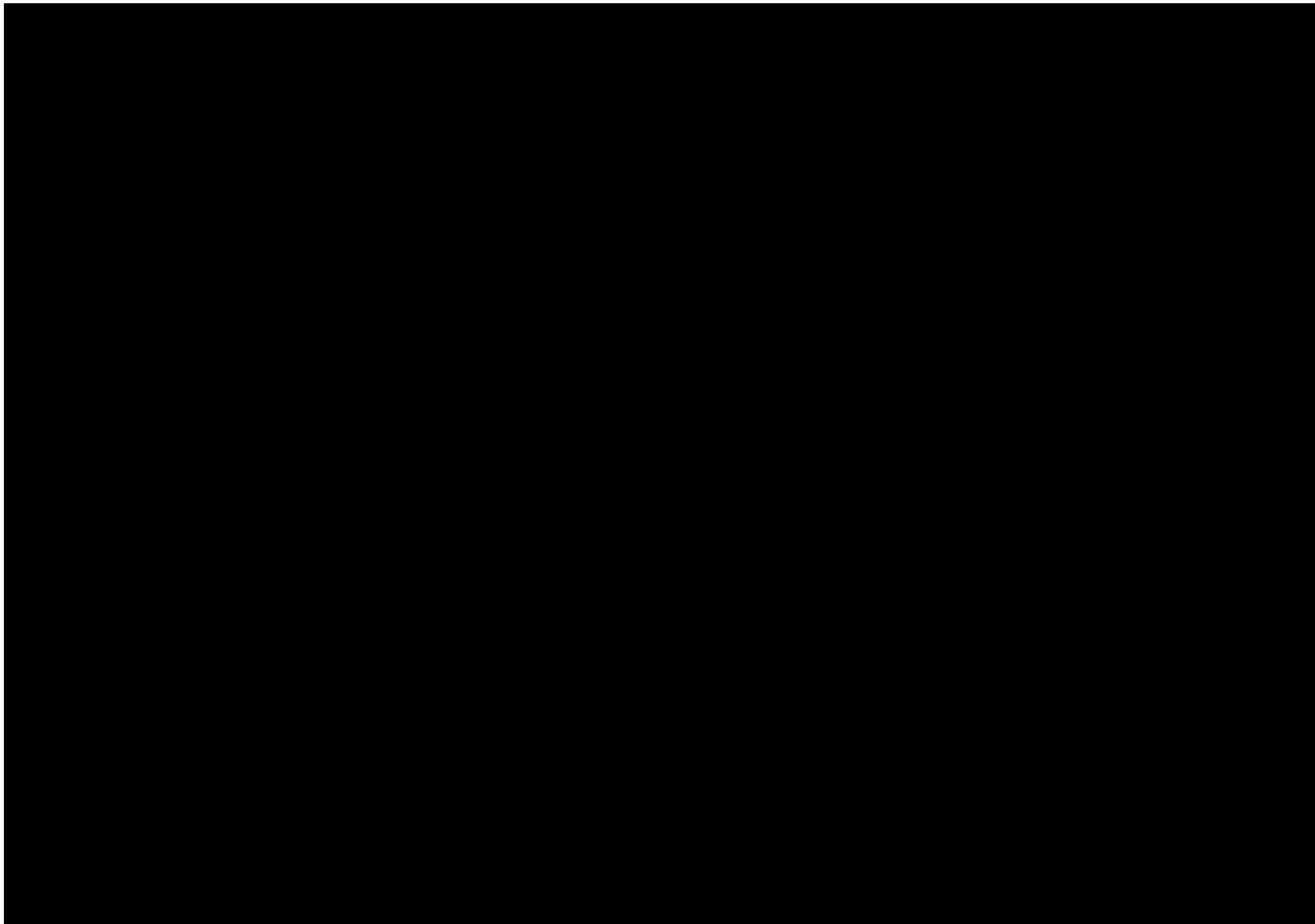


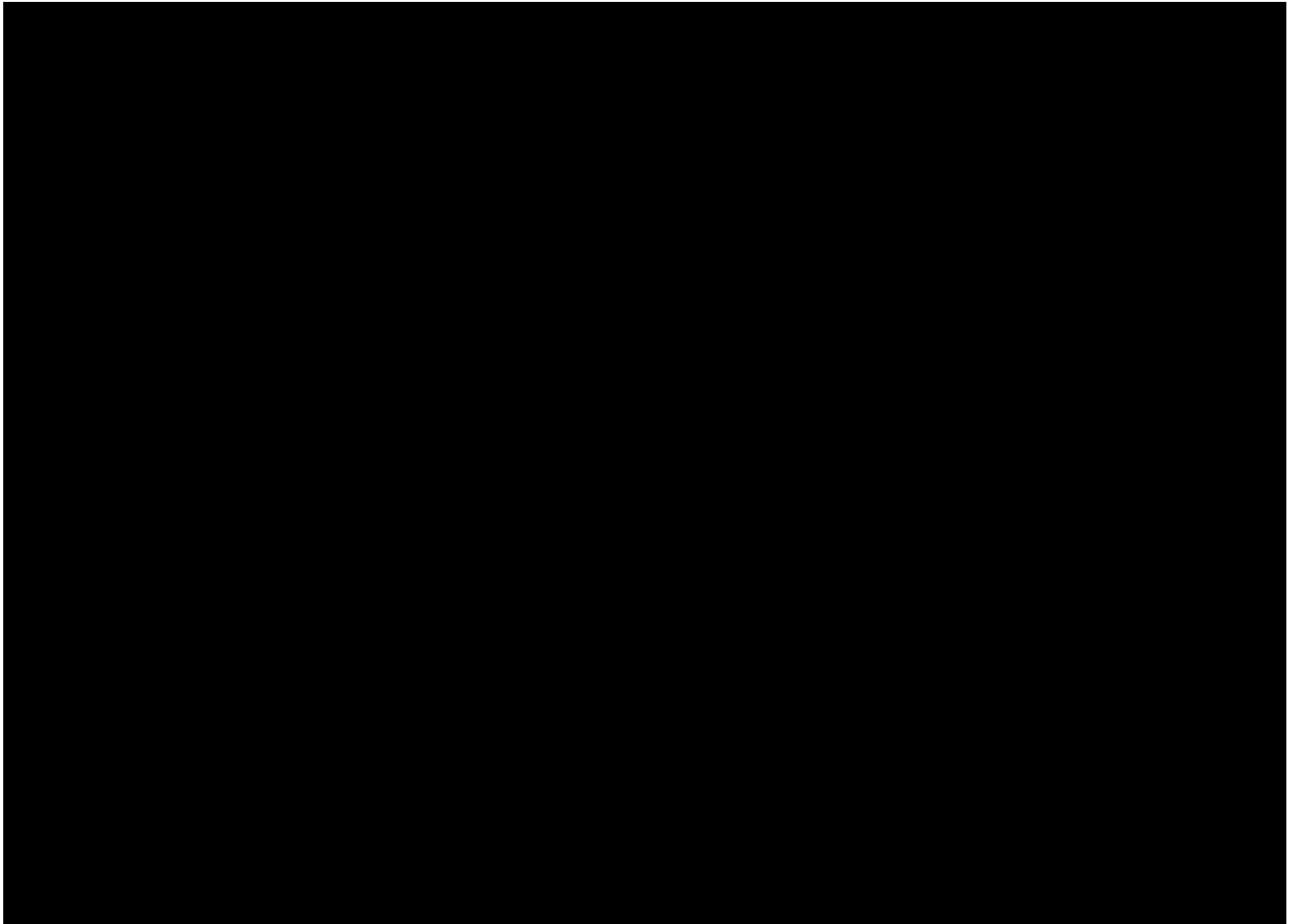


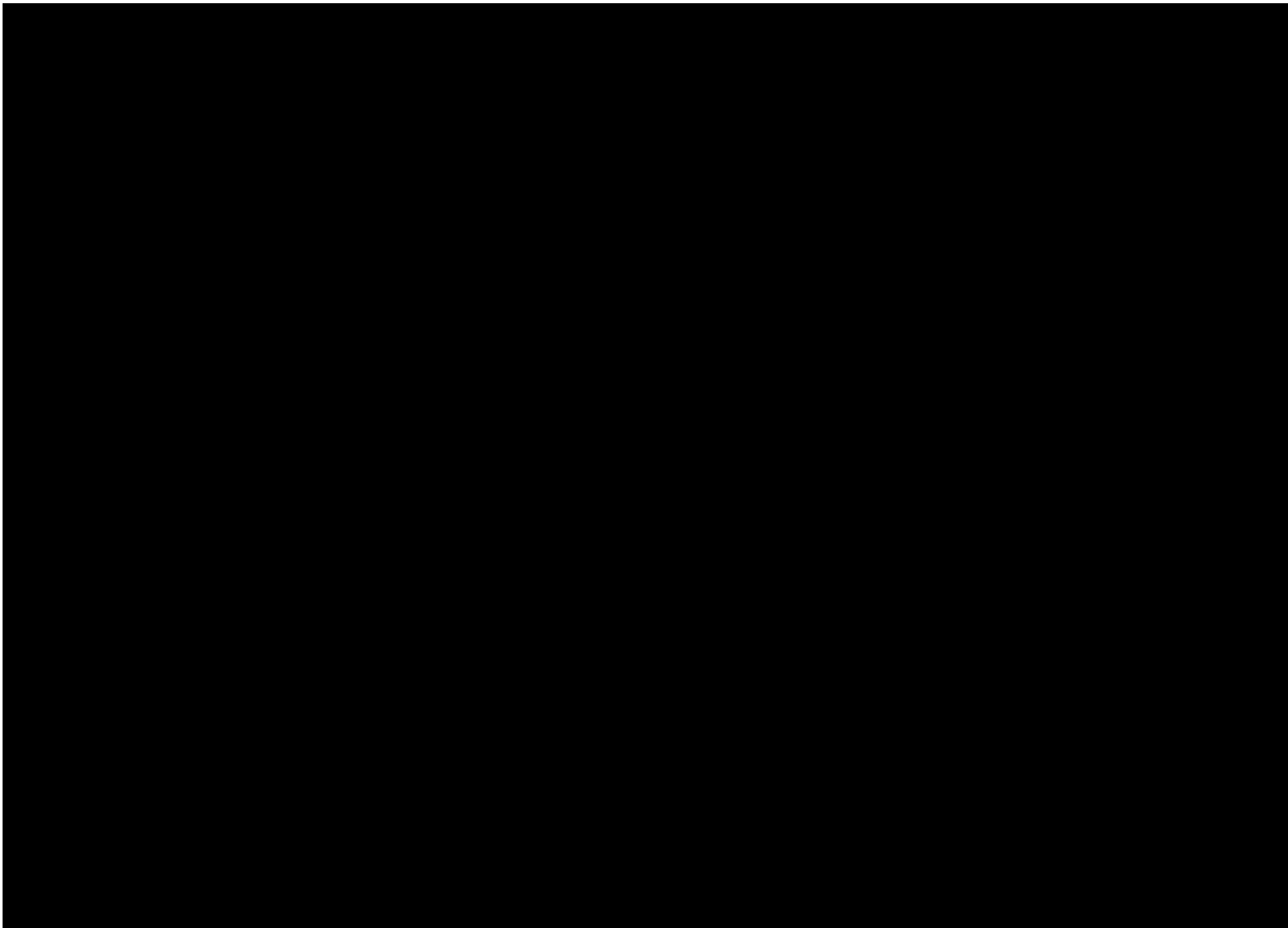


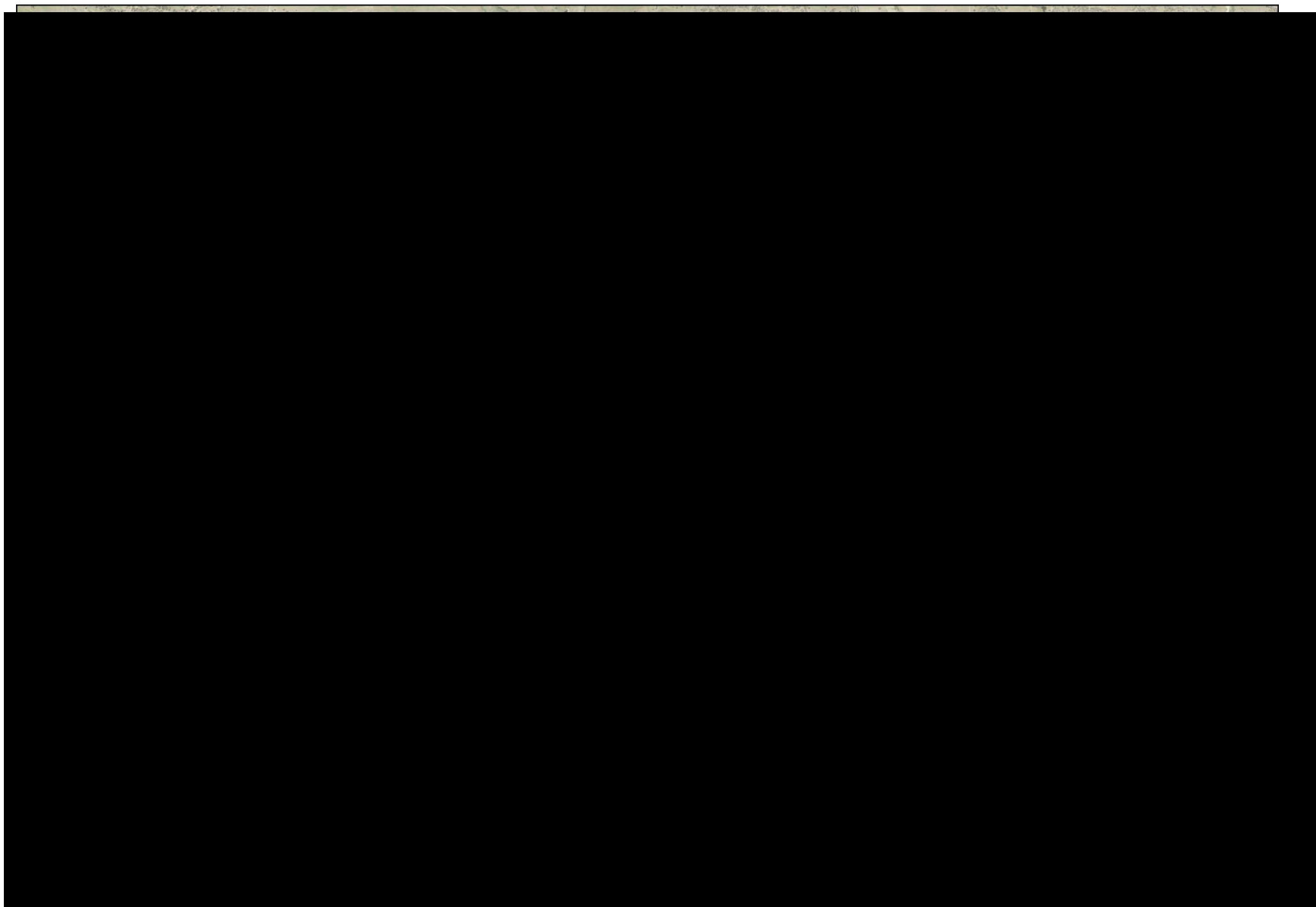
APPENDIX C: THREATENED FLORA HABITAT LOCATIONS

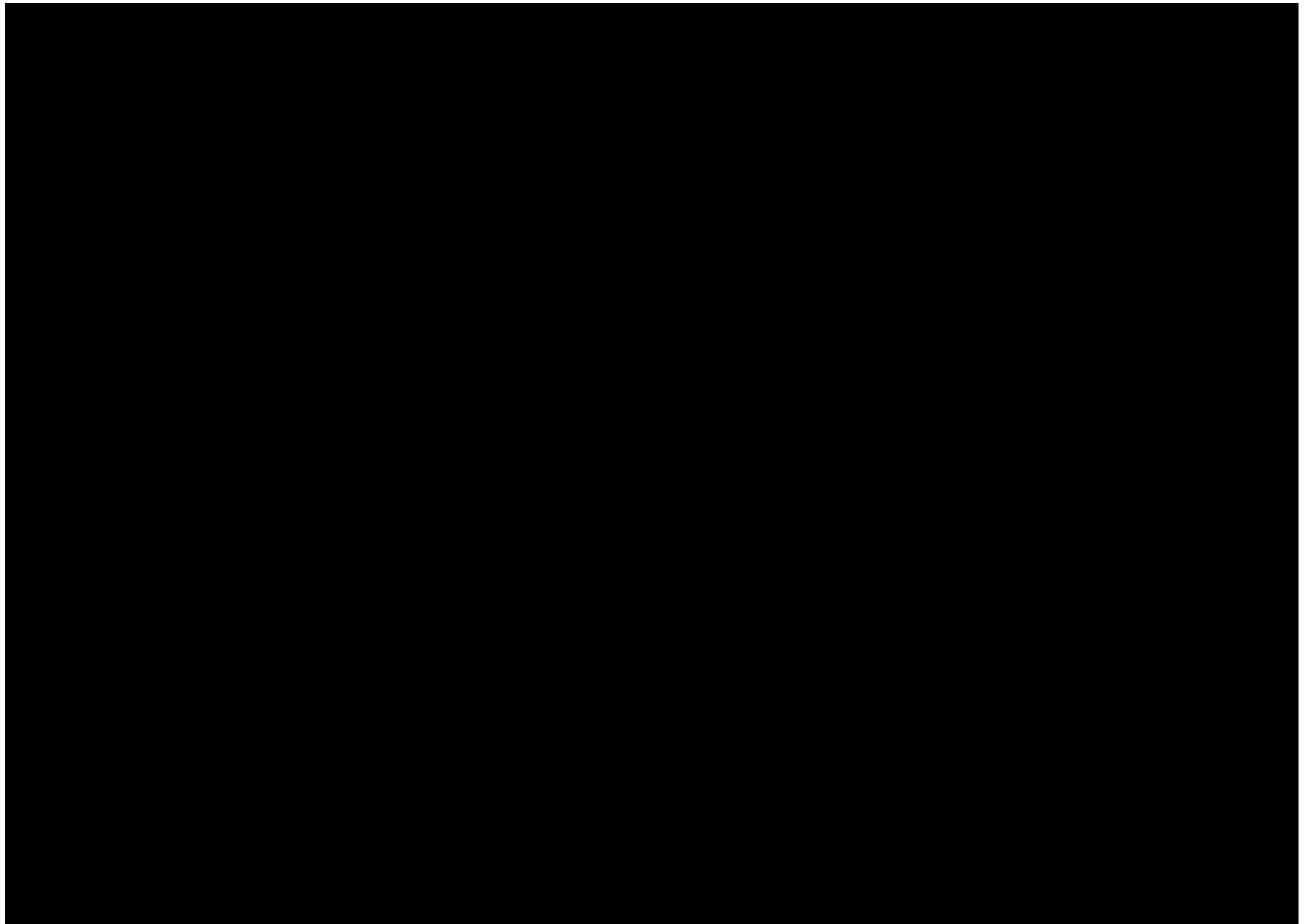


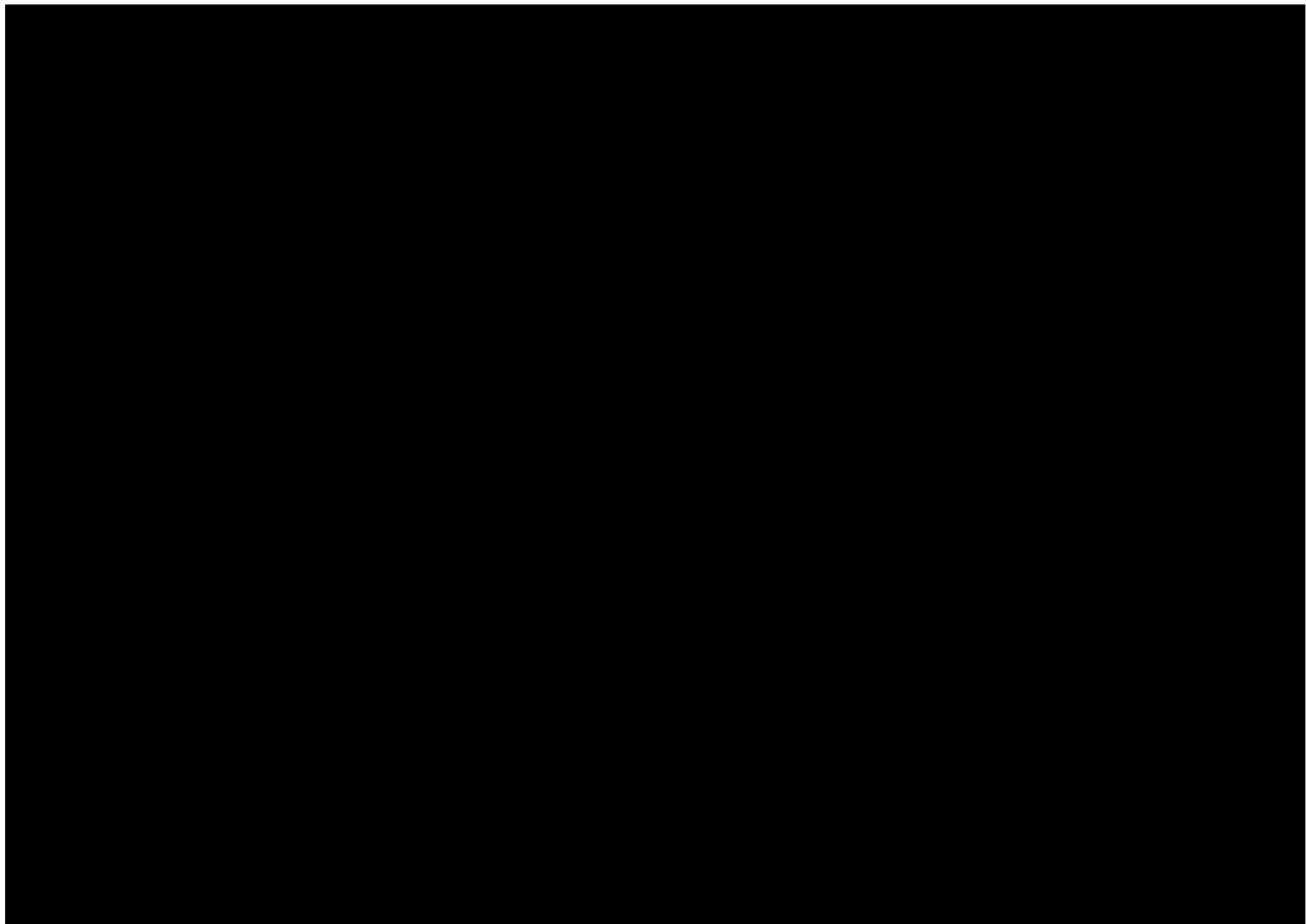




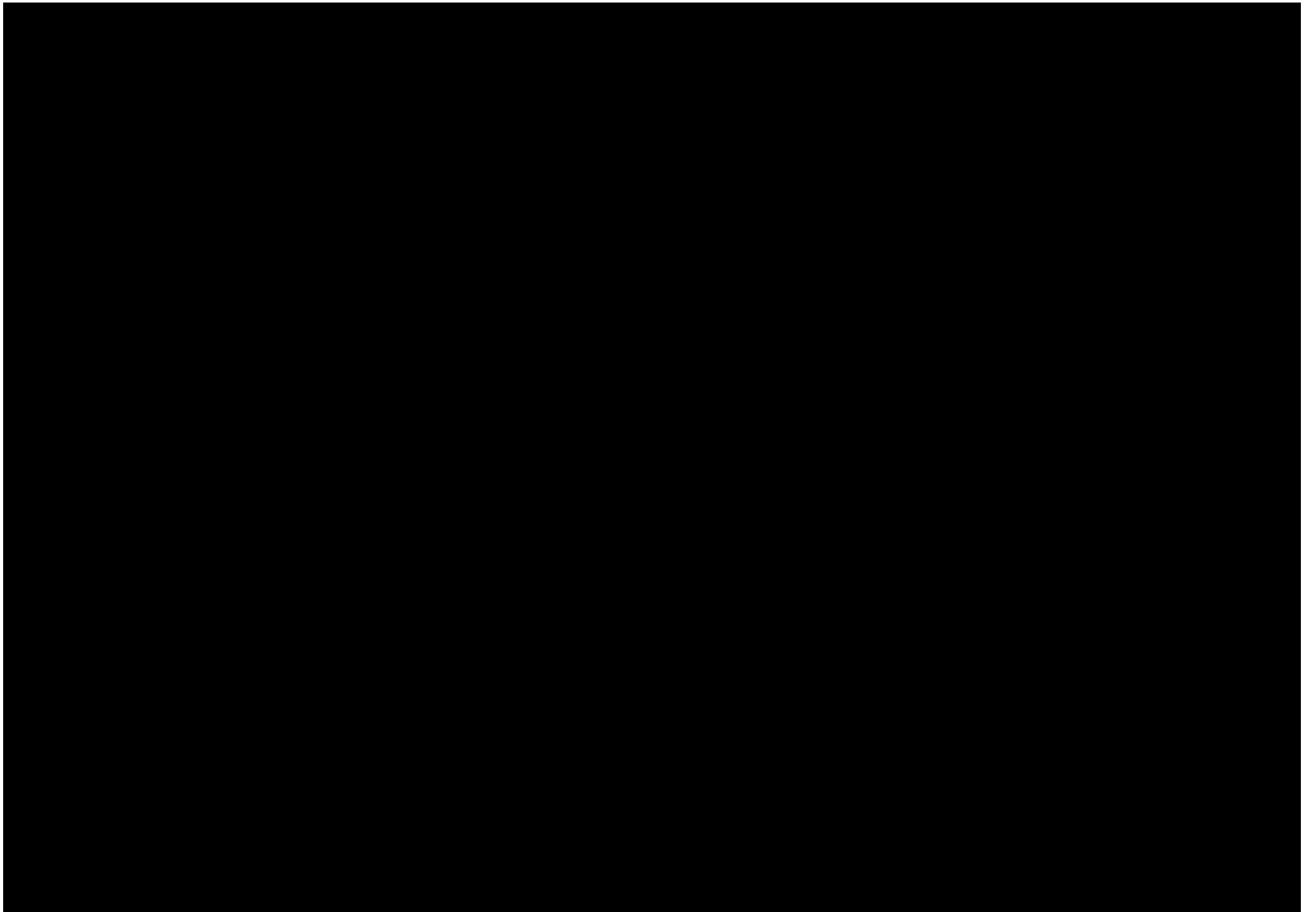


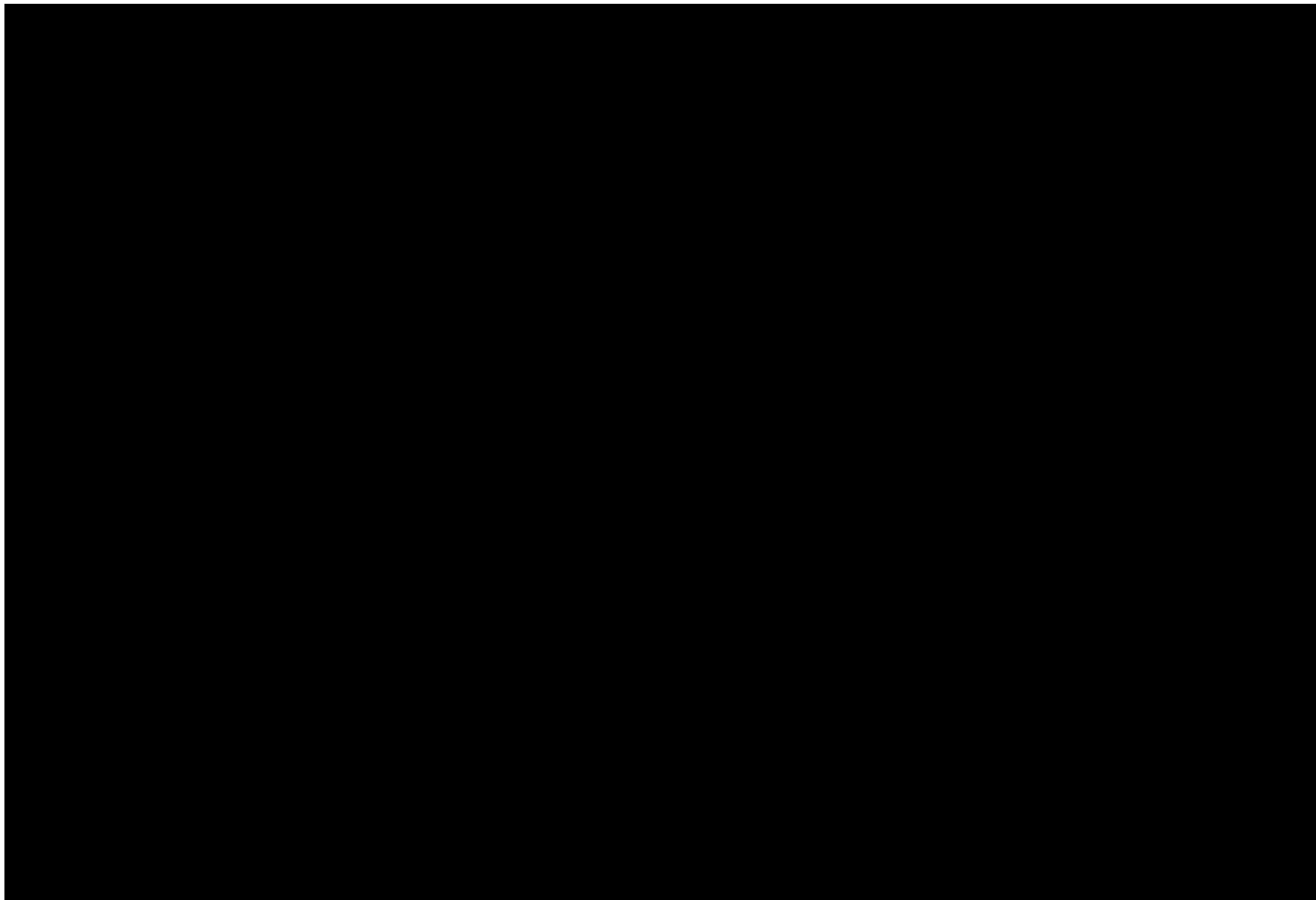


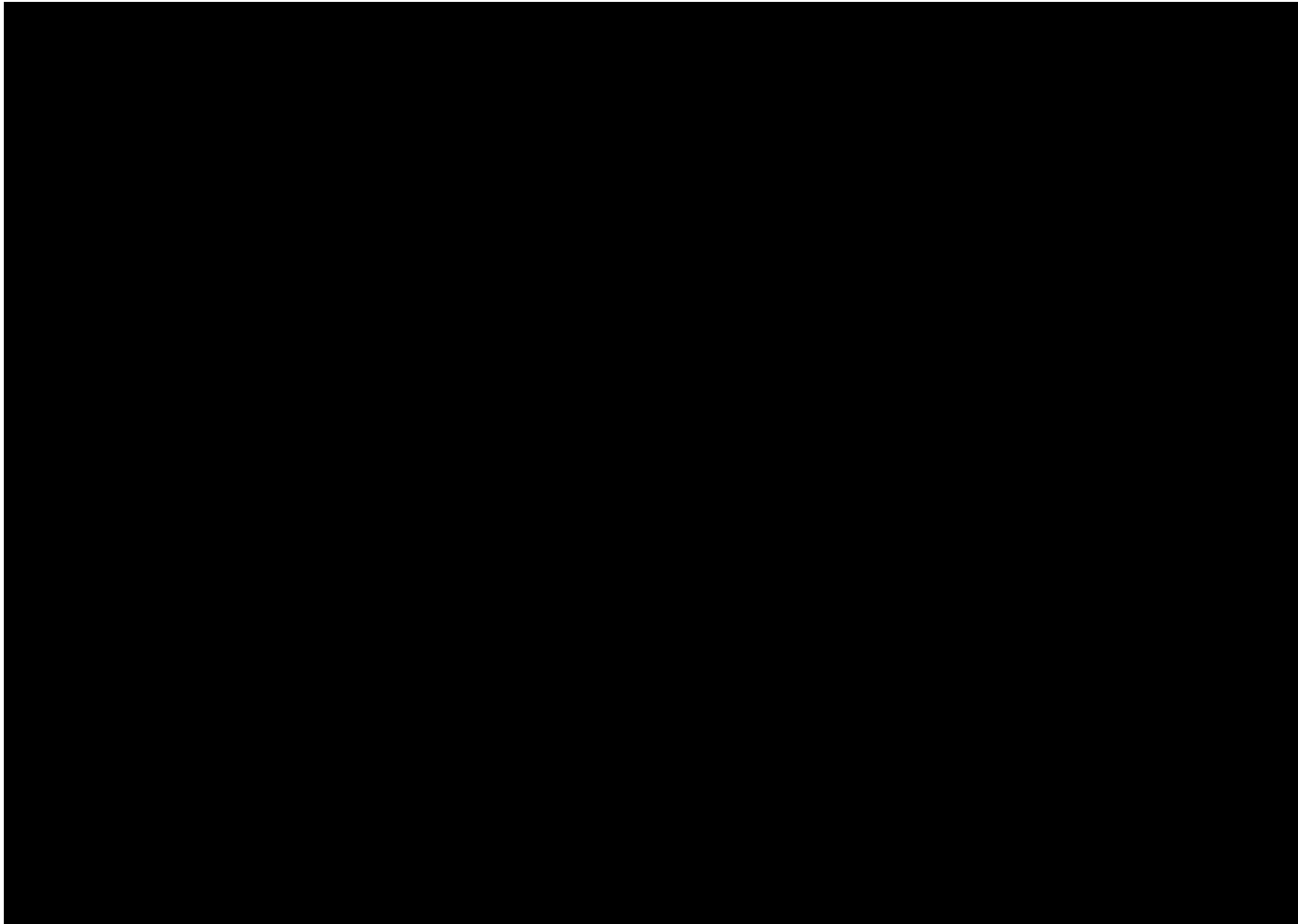


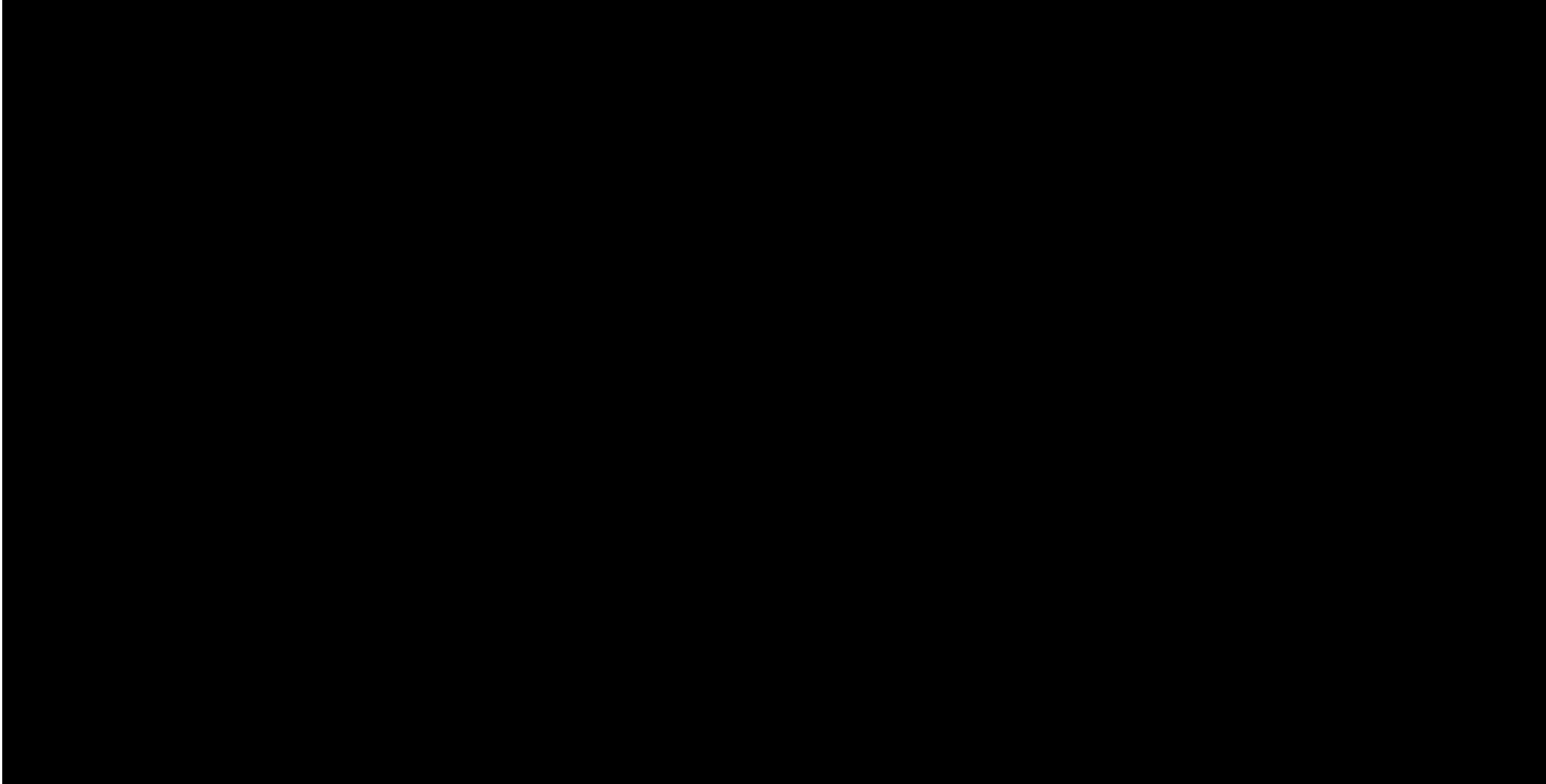
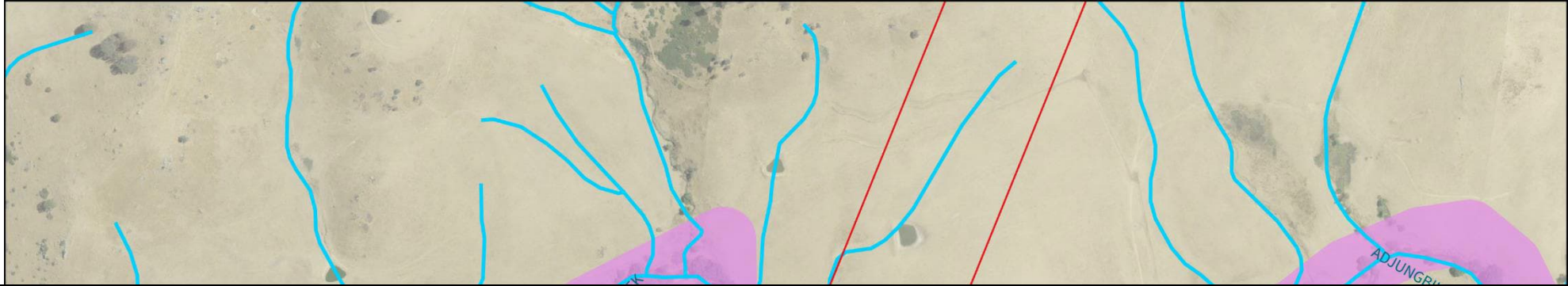


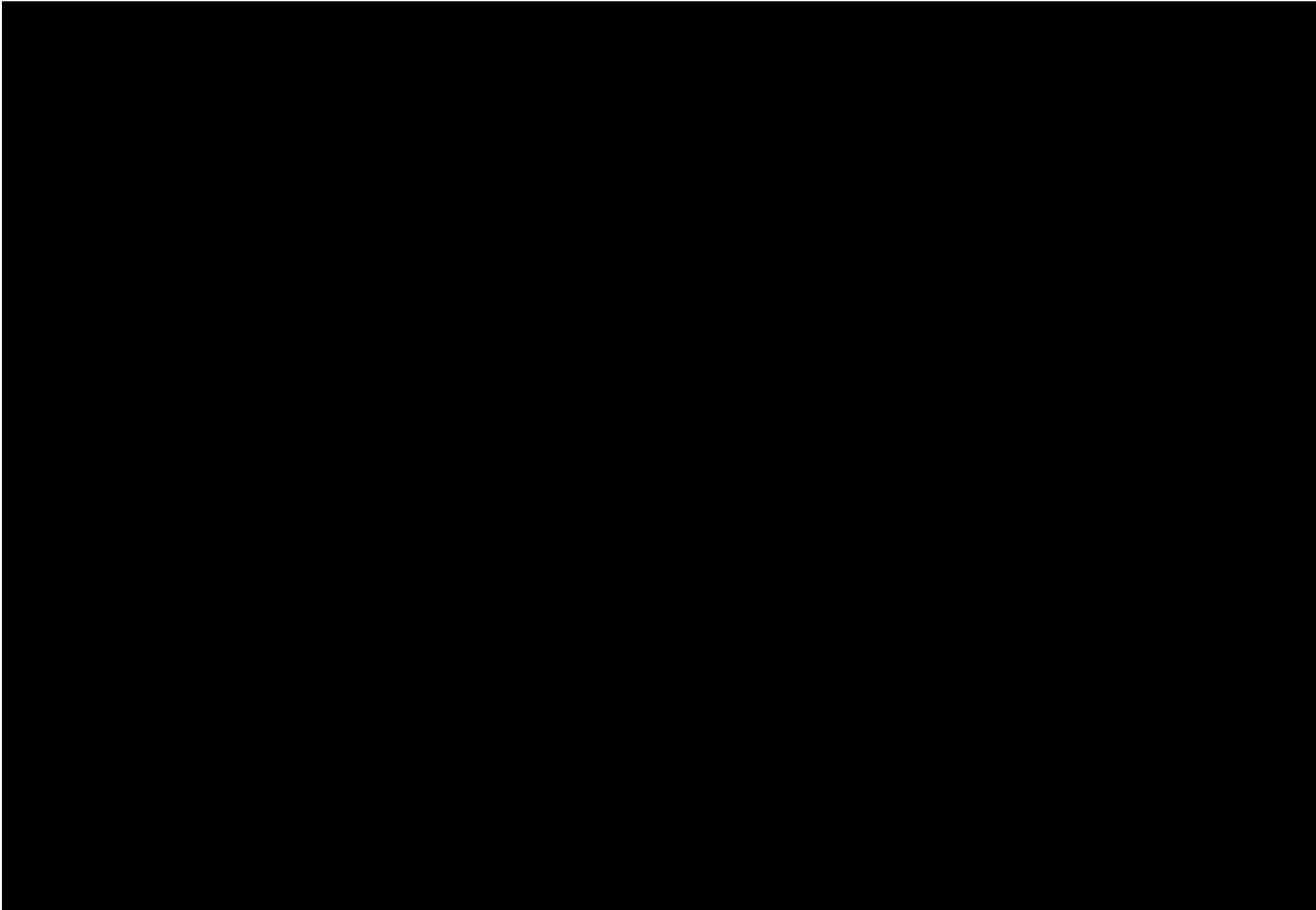
APPENDIX D: THREATENED FROG MONITORING LOCATIONS

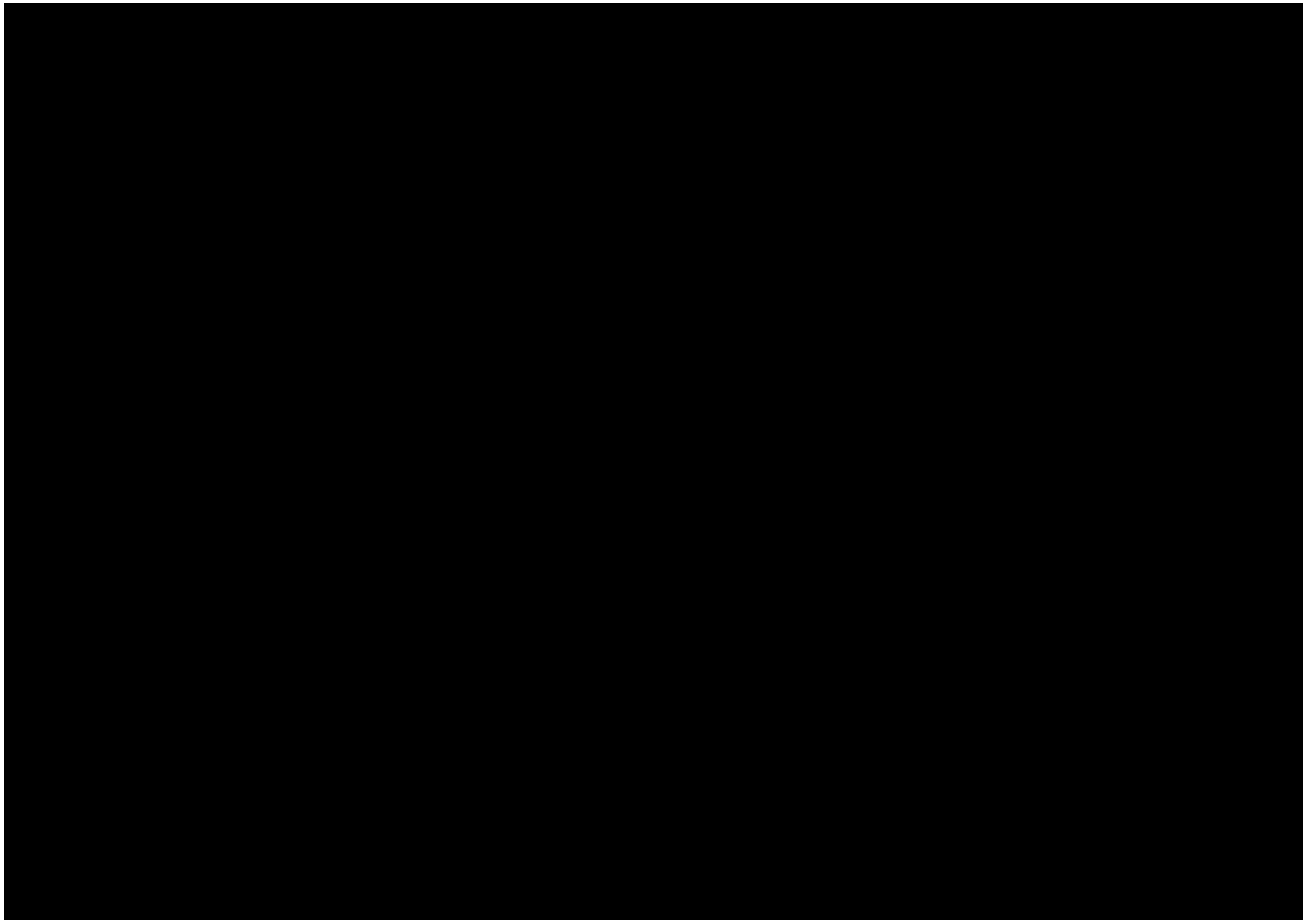


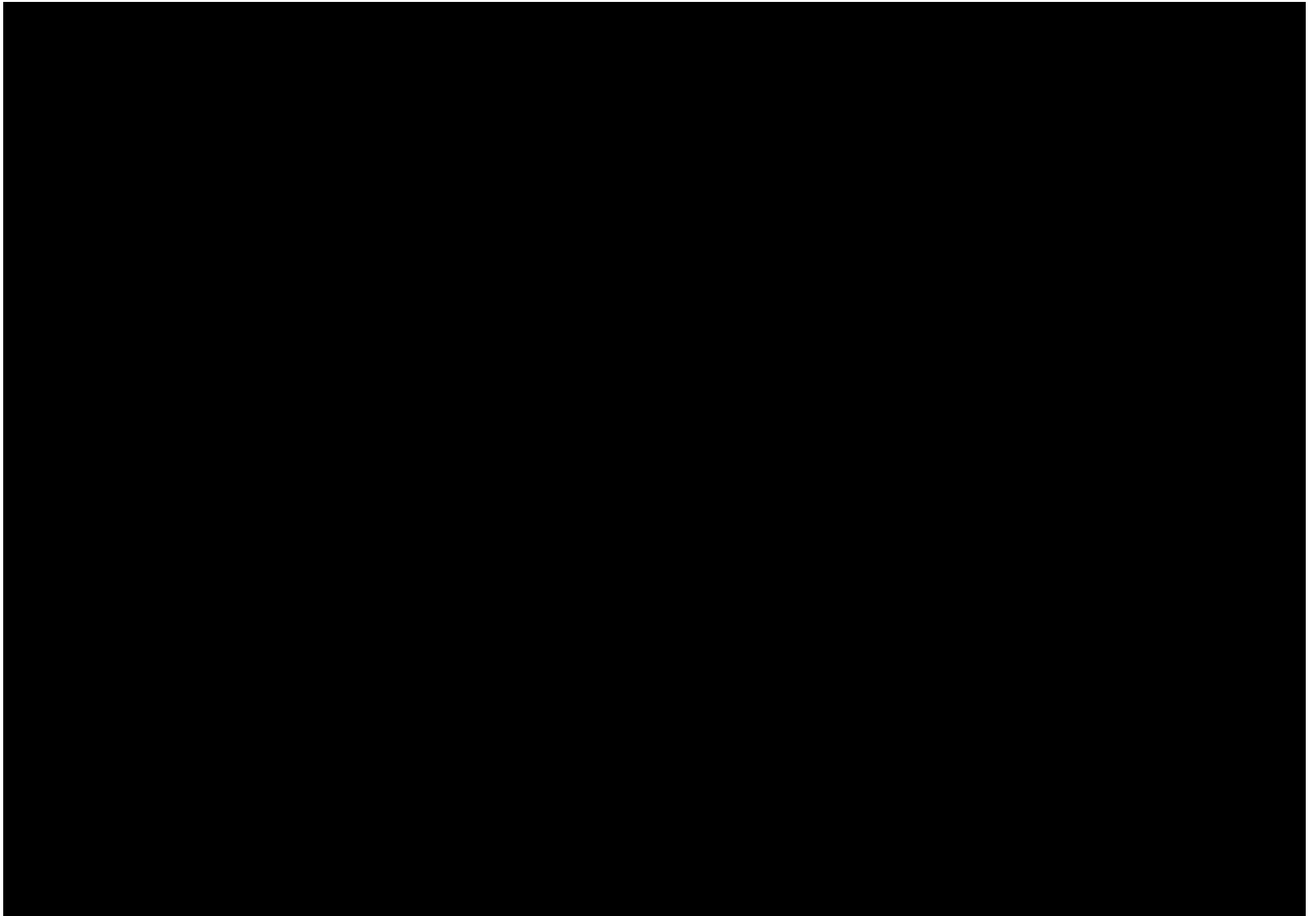


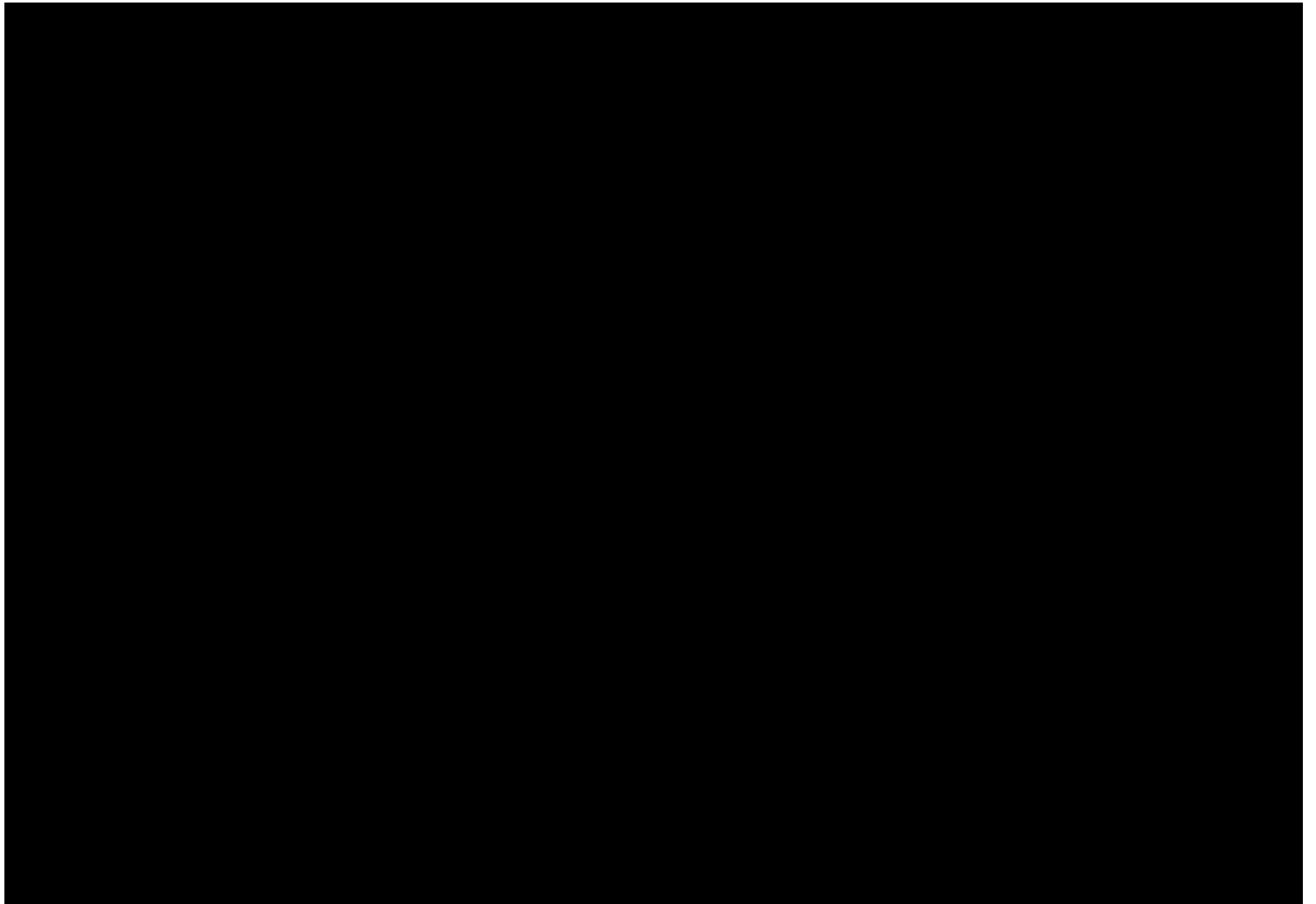


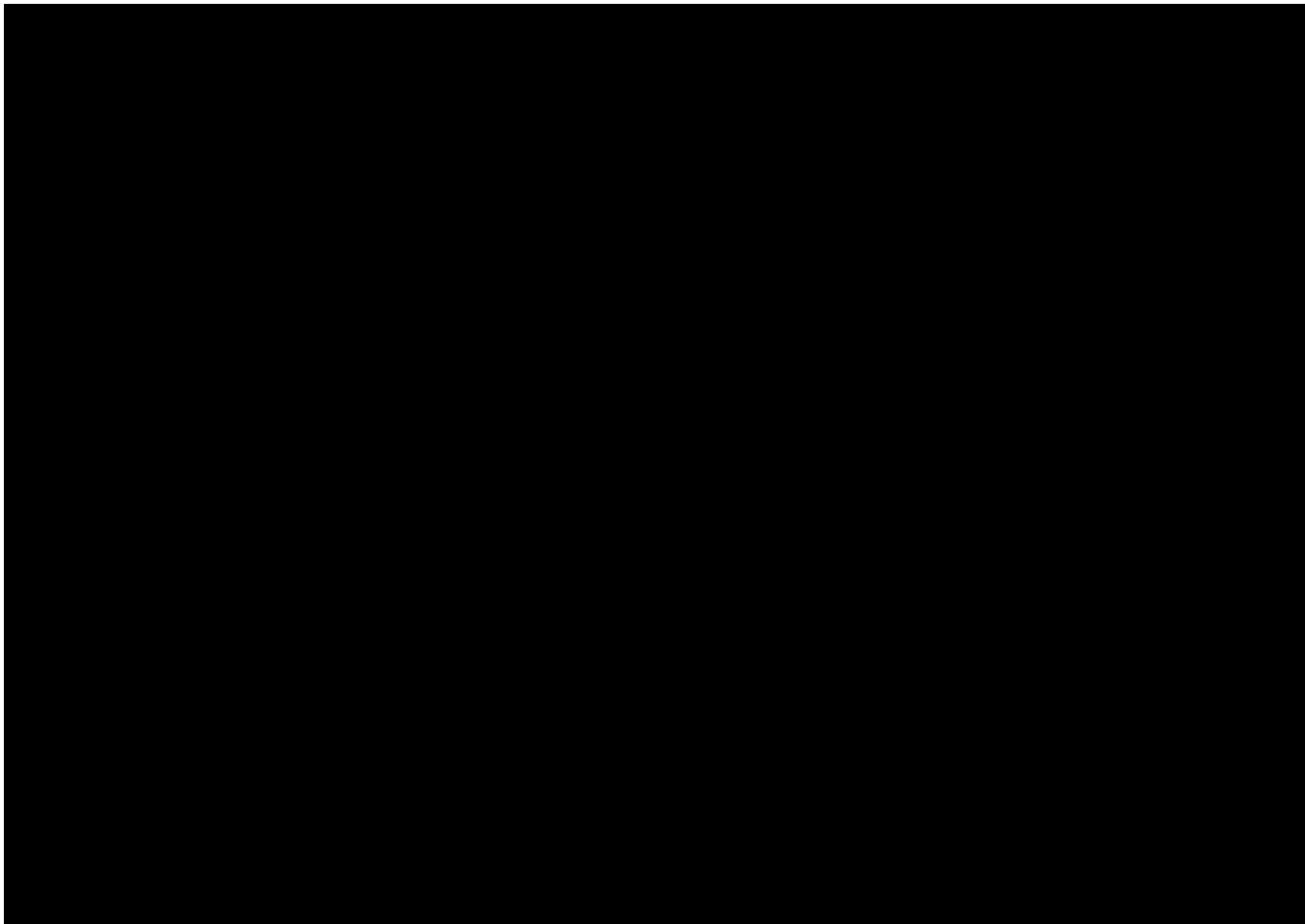


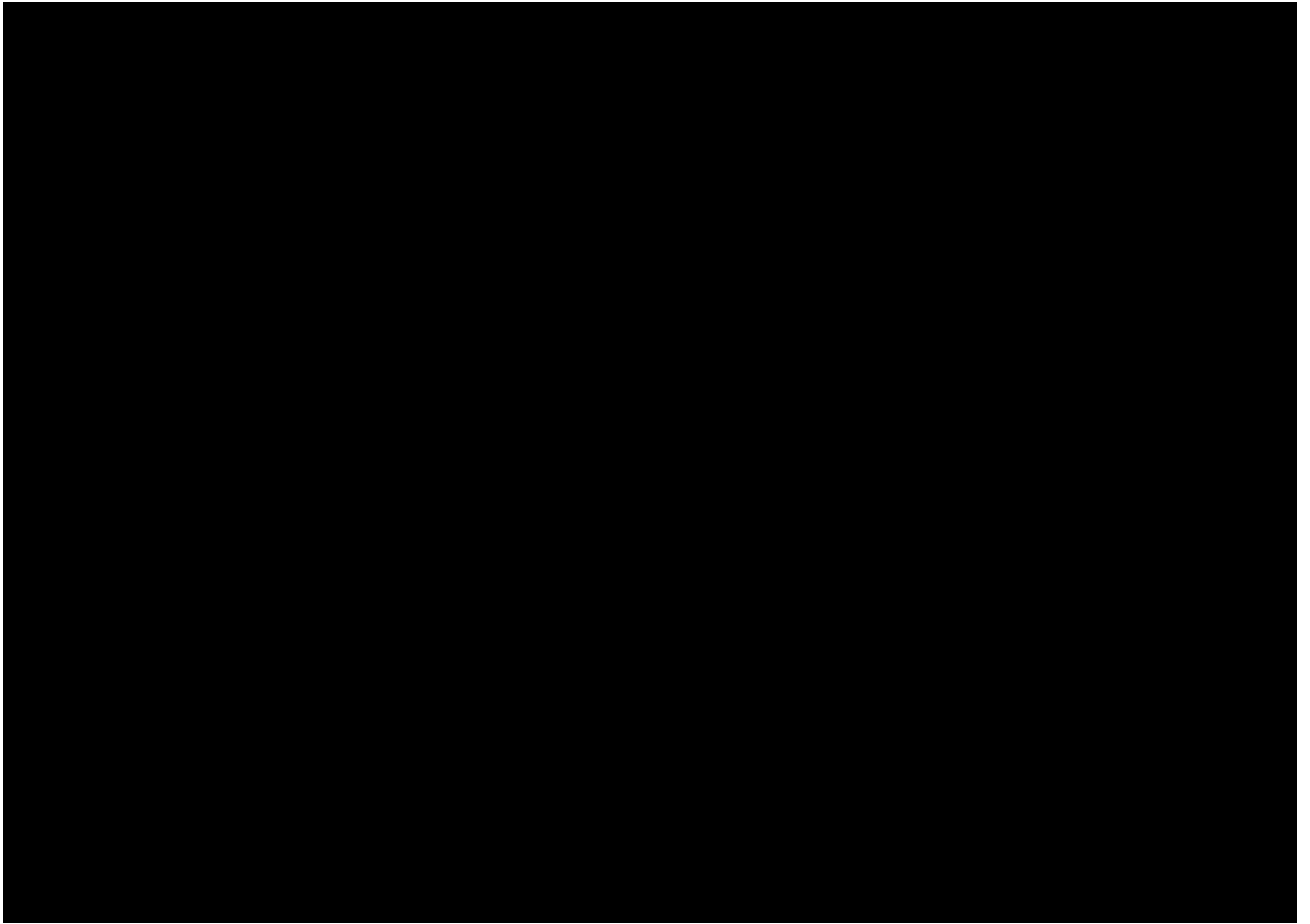






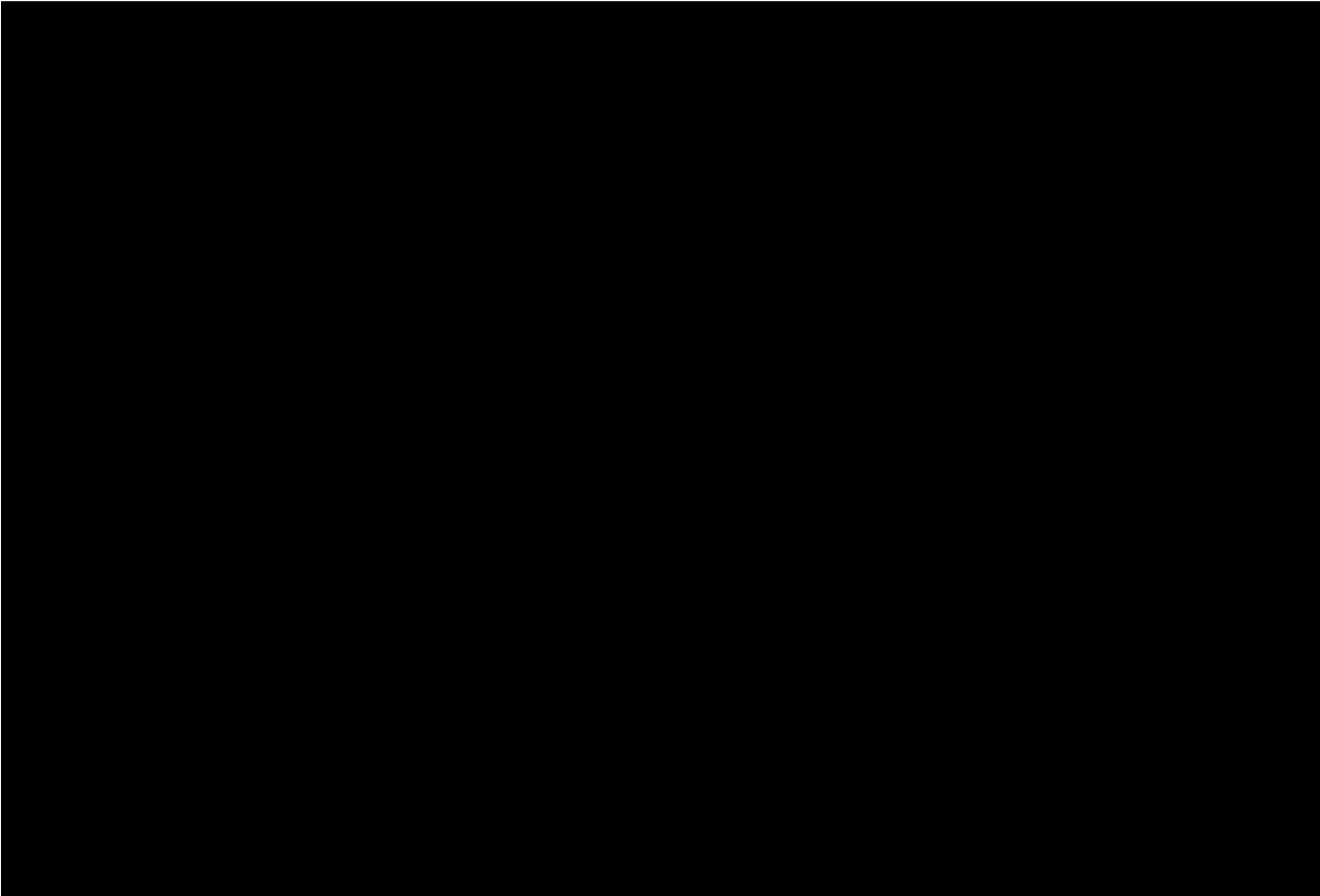


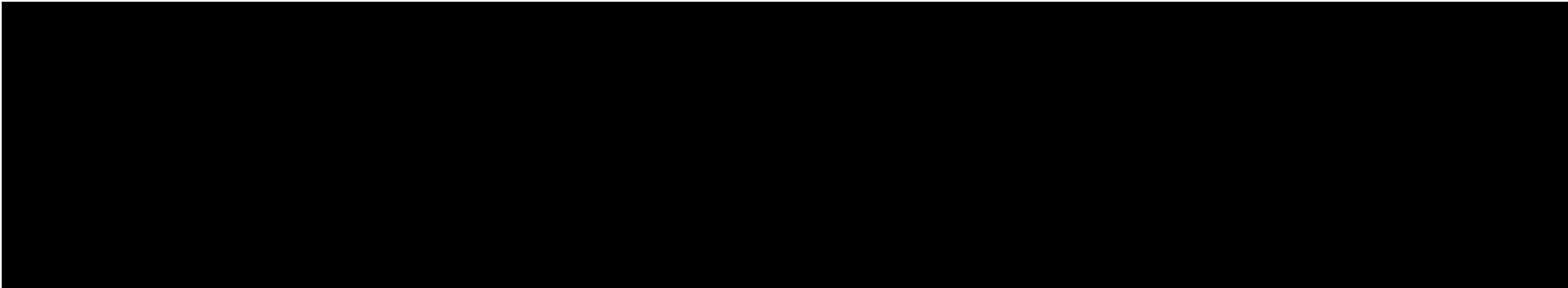




APPENDIX I BMP HUMELINK EAST SPATIAL DATA







APPENDIX J CONSTRAINTS MAPPING



HumeLink EAST

Biological Constraint Mapping

